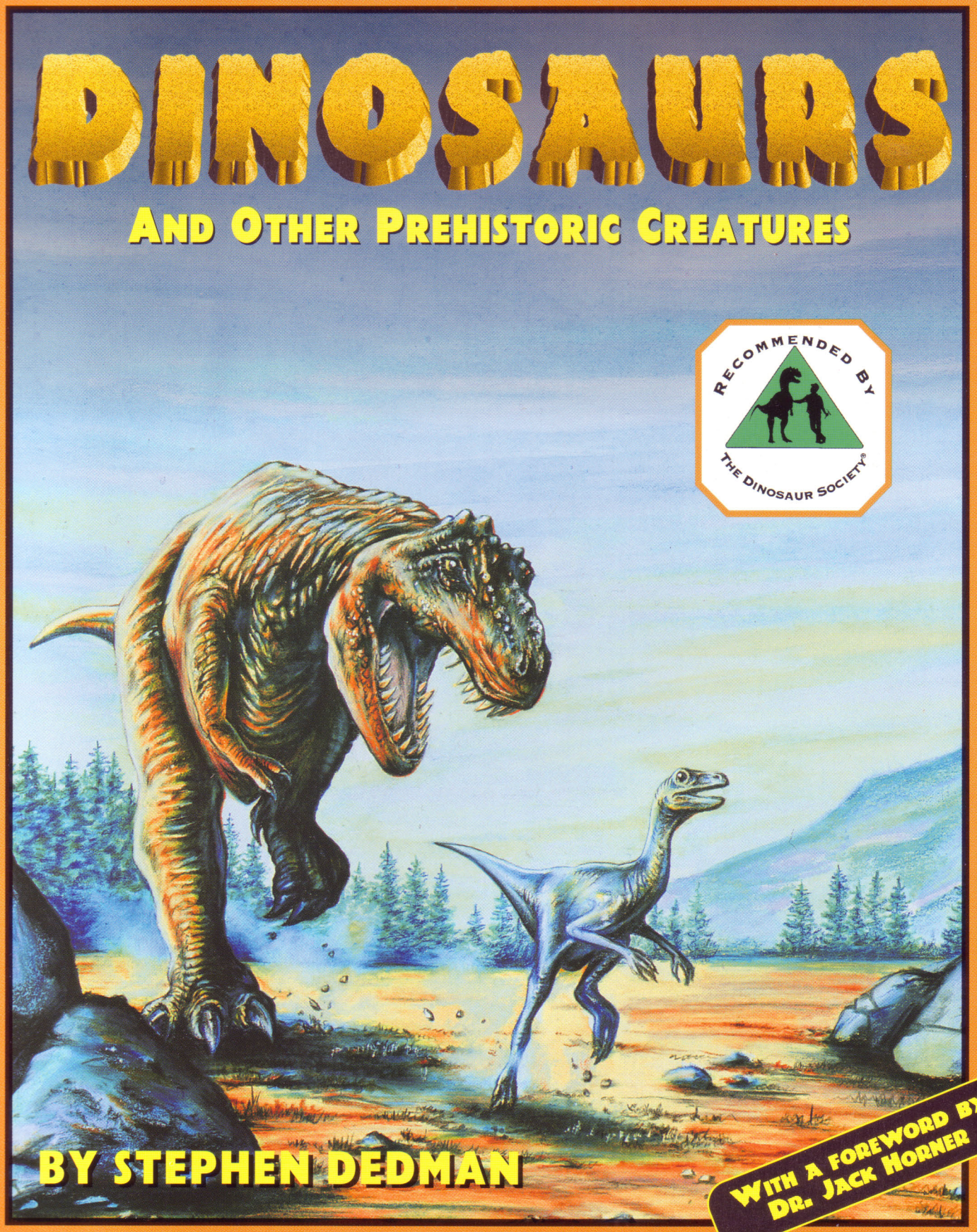
GURPS®

DINOSAURS

And Other Prehistoric Creatures



BY STEPHEN DEDMAN

With a foreword by Dr. Jack Horner

STEVE JACKSON GAMES

GURPS

DINOSAURS

And Other Prehistoric Creatures

By Stephen Dedman

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STEVE JACKSON GAMES

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FOREWORD

BY DR. JACK HORNER

I am a paleontologist. So I was a bit surprised when I was asked to write an introduction to a roleplaying game, even one on dinosaurs. "What's that?" I asked, as I opened the envelope containing the manuscript. I was quickly absorbed in a fascinating trip based on paleontological fact, with some interesting side trips into pure speculation.

GURPS Dinosaurs is an integration of scientific detail, derived from the professional and popular writings of paleontologists, with the imaginative speculations of its author, Stephen Dedman. While ***GURPS Dinosaurs*** won't get you through your Paleo 101 final, it will allow you to travel through time into environments inhabited by long-extinct species fierce and gentle, huge and small.

As a dinosaur paleontologist and evolutionary biologist, my job is to gather the evidence which allows us to better visualize extinct organisms, their ecologies, and how they lived their lives. And one thing I've learned is how organisms adapt to their environments, how the struggle for survival can only be described as a merciless act of aggression which yields a progression of successes.

It is, of course, evolution which allows organisms to adapt to these particular environments. Leaving the environment in which you evolved and traveling to another can only be described as a dangerous venture. Entering an environment other than the one in which you originally evolved makes you a competitive alien, regardless of intent. You have invaded the ecological space of another organism which, by definition, is better adapted to this environment.

Interestingly, the farther back in time you go, the less chance there is of surviving, because the farther back you venture, the less adapted you are to the environment. (Of course, this scenario also works in reverse. If you decide to bring presently-extinct organisms forward in time, you must keep in mind their survival odds are *very* low. This is especially true if the organism was driven into extinction by another, more competitive species.)

There are other problems with time travel as well, some of which would require tremendous preparation. For example, consider placing the time travel device in your back yard and attempting a trip back 100 million years. What altitude was the surface of the ground? It could have been under a mile or so of rock, a thousand feet in the air, or under water. Was your back yard even part of a continent 100 million years ago? Continents move! Before striking out to visit the Jurassic Period, I would strongly suggest learning as much as possible about geology and paleogeography.

Regardless of whether you choose an actual creature from the past or create a new one using the data presented by Mr. Dedman, you have surely entered an extraordinary realm, a realm where the chronological horizons exceed a billion years, and the only geographic limitation is the entire planet. Learn about the history of the ancient worlds and you will be, like myself, on a fantastic voyage in time.

John R. Horner
Bozeman, MT
Dec. 12, 1995

INTRODUCTION

Though their name has become associated with everything unwieldy and obsolete, from bankrupt superpowers to last year's computers, the tale of the dinosaurs is one of the greatest success stories ever. Mammals evolved alongside the earliest dinosaurs and, for more than 165 million years, survived by being too small for the "terrible lizards" to bother chasing.* Long before the dagger-tooths and dire wolves, there were five-ton carnosaurs and man-sized raptors. Before the mammoths and woolly rhinos, there were sauropods as long as blue whales, elephant-sized hornfaces, armored ankylosaurs, and huge herds of hadrosaurs. Not until the dinosaurs had been gone for 63 million years did hominids start banging rocks together.

After millenia of their bones inspiring myths of dragons and other monsters, dinosaurs were rediscovered in the mid-19th century (the word "dinosaur" is some 153 years old as I write), and quickly bullied their way into popular culture. Now, despite being extinct, their commercial dominion is enormous. We should look so good after 65 million years.

This book is a bestiary and chronology of the "interesting and extinct," from the trilobites of the Paleozoic to the early tool-users of the Pleistocene. It is primarily intended as an aid for the ***GURPS Time Travel*** GM who wishes to send PCs to any era in prehistoric Earth, but it is also a source of monsters and lost worlds for any genre – ***Supers, Space, Atomic Horror, Fantasy, Cliffhangers,*** even ***Cyberpunk*** and ***Old West***. Chapter 9 gives campaign and adventure suggestions for all of these worlds and more, including stone age campaigns – realistic, fractured history, and slapstick. Chapters 9 and 10 give character creation and roleplaying information for early hominids and humans, with a brief guide to shamanic magic. Also included are a bibliography and filmography, for serious dinophiles.

I would like to thank the Dinosaur Society for their help with this project and their sponsorship of dinosaur research and education. Thanks also to the paleontologists, museum staff, writers, and film-makers (some of them, anyway) for fueling a life-long fascination with the "terrible lizards" and other prehistoric creatures.

– *Stephen Dedman*

About the Author

Stephen Dedman has been an education officer and used dinosaur salesman for the Western Australian Museum, the manager of a science fiction bookshop, an editorial assistant for *Australian Physicist*, and an experimental subject. His other writing credits include ***GURPS Space Atlas 4, GURPS Martial Arts Adventures,*** a dinosaur bestiary for ***Car Wars,*** and two ***Villains and Vigilantes*** adventures. His short stories have appeared in *Fantasy & Science Fiction, Asimov's Science Fiction, Science Fiction Age,* and several anthologies. He lives in Perth with his wife, two saber-clawed cats, and a large collection of plastic dinosaurs.

*Although "terrible lizard" is the common translation of "dinosaur," it should be noted that when Richard Owen coined the word in his 1842 text, *British Fossil Reptiles*, he gave the derivation as "fearfully great lizards."

About GURPS

Steve Jackson Games is committed to full support of the ***GURPS*** system. Our address is SJ Games, Box 18957, Austin, TX 78760. Please include a self-addressed, stamped envelope (SASE) any time you write us! Resources now available include:

Pyramid. Our bimonthly magazine includes new rules and articles for ***GURPS,*** as well as information on our other lines: ***Car Wars, Toon, INWO, Ogre Miniatures*** and more . . . and, of course, the new ***Dino Hunt***! It also covers top releases from other companies — ***Traveller, Call of Cthulhu, Shadowrun***, and many more.

New supplements and adventures. We're always working on new material, and we'll be happy to let you know what's available. A current catalog is available for an SASE.

Errata. Everyone makes mistakes, including us — but we do our best to fix our errors. Up-to-date errata sheets for all ***GURPS*** releases, including this book, are always available from SJ Games; be sure to include an SASE with your request.

Q&A. We do our best to answer any game question accompanied by an SASE.

Gamer input. We value your comments. We will consider them, not only for new products, but also when we update this book on later printings!

Online. For those who have home computers, Illuminati Online supports SJ Games with discussion areas for many games, including ***GURPS***. Here's where we do a lot of our playtesting! It's up 24 hours per day at 512-448-8950, at up to 28.8K baud (28.8 users should dial directly to 512-448-8988) — or telnet to io.com. Give us a call! And visit us on the World Wide Web at http://www.io.com/sjgames/. We also have conferences on Compuserve, GEnie, and America Online.

Page References

Rules and statistics in this book are specifically for the ***GURPS Basic Set***, Third Edition, Revised. Any page reference that begins with a B refers to the ***GURPS Basic Set*** — e.g., p. B102 means p. 102 of the ***GURPS Basic Set***, Third Edition, Revised. A reference that begins with CI indicates ***GURPS Compendium I: Character Creation***. A reference that begins with TT indicates ***GURPS Time Travel.***

TIMELINE

MYA (millions of years ago)

4,600 PRE-CAMBRIAN ERA

4,600 Earth coalesces from gas ring and begins to cool.
3,800 First life on Earth.
3,600 First stromatolites (blue-green algae), oldest known fossils.
1,200 Earth develops year-round oxygen atmosphere and ozone layer.
700 Invention of sex.
680 Ediacaran fauna: first known multicellular life.
600 First animals with exoskeletons.

590 PALEOZOIC ERA

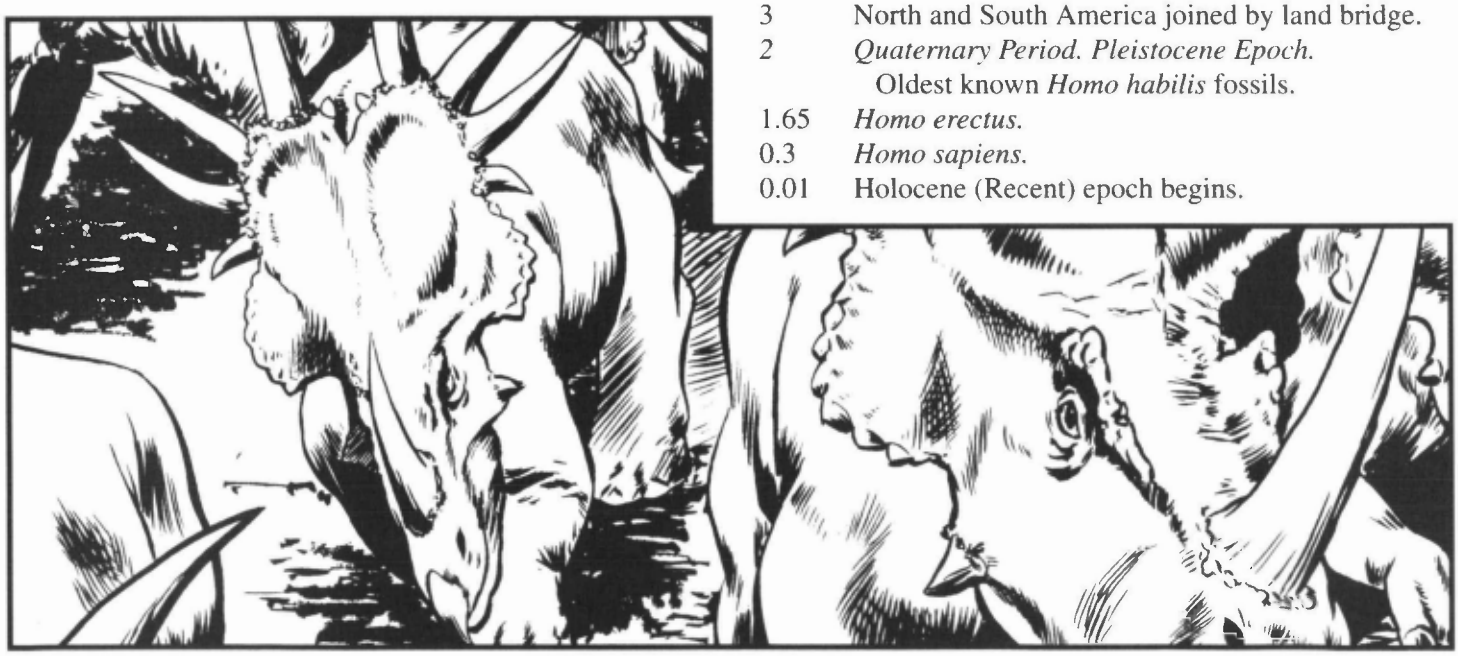
590 *Cambrian Period.*
505 *Ordovician Period.* First land plants: club mosses.
438 *Silurian Period.*
408 *Devonian Period.* First spiders and wingless insects.
370 First amphibians.
360 *Mississippian (Lower Carboniferous) Period.*
320 *Pennsylvanian (Upper Carboniferous) Period.* First conifers, first winged insects (mayflies).
300 First reptiles.
286 *Permian Period.*
250 Land masses begin to merge to create Pangaea.

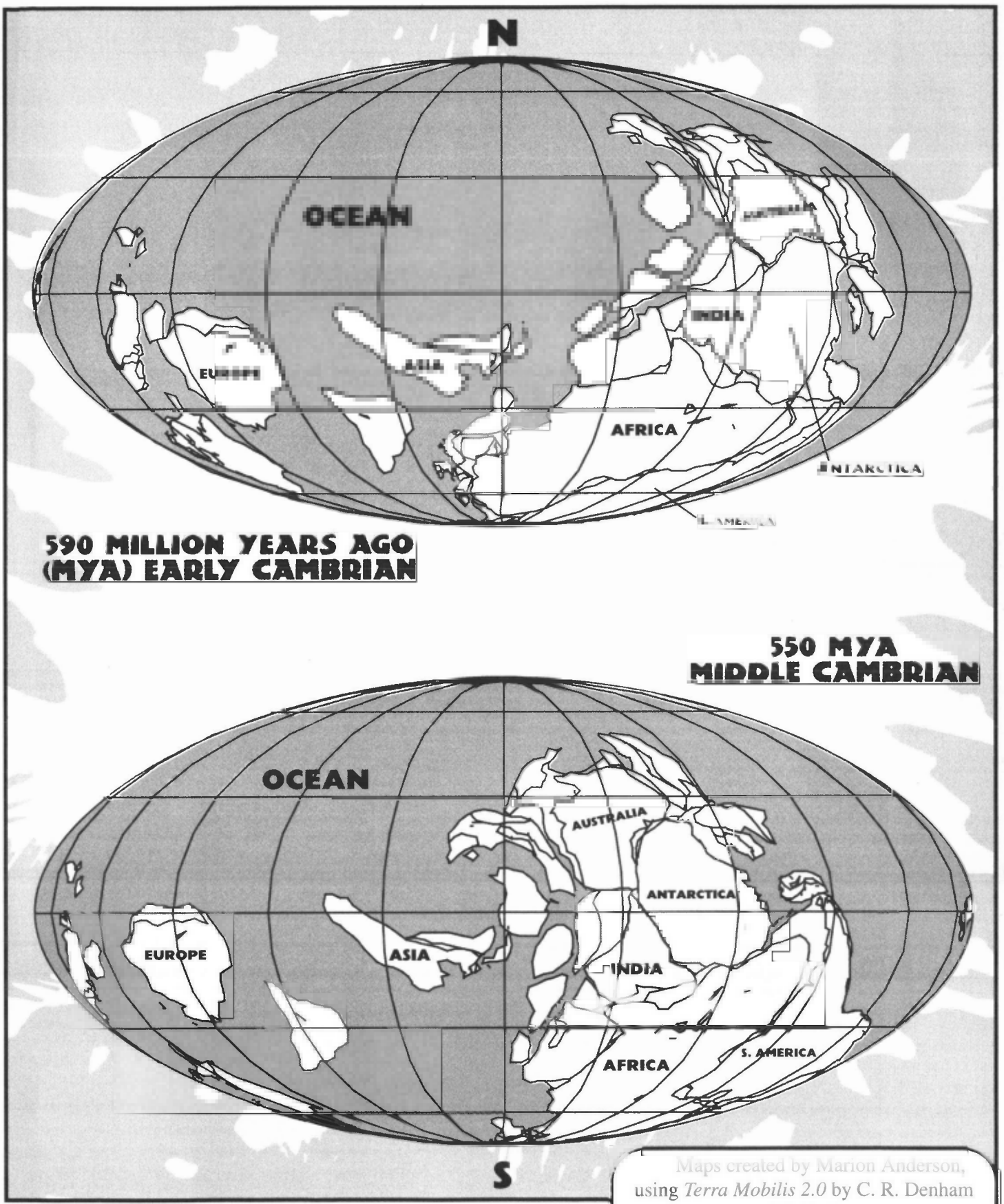
248 MESOZOIC ERA

248 *Triassic Period.*
230 First dinosaurs, first mammals.
213 *Jurassic Period.* First frogs.
150 Pangaea is splitting into northern Laurasia and southern Gondwana.
140 First flowers.
145 *Cretaceous Period.*
100 Continents continue to separate.
80 First snakes (non-venomous constrictors).
70 First primates (*Purgatorius*) and carnivorous mammals (*Miacis*).

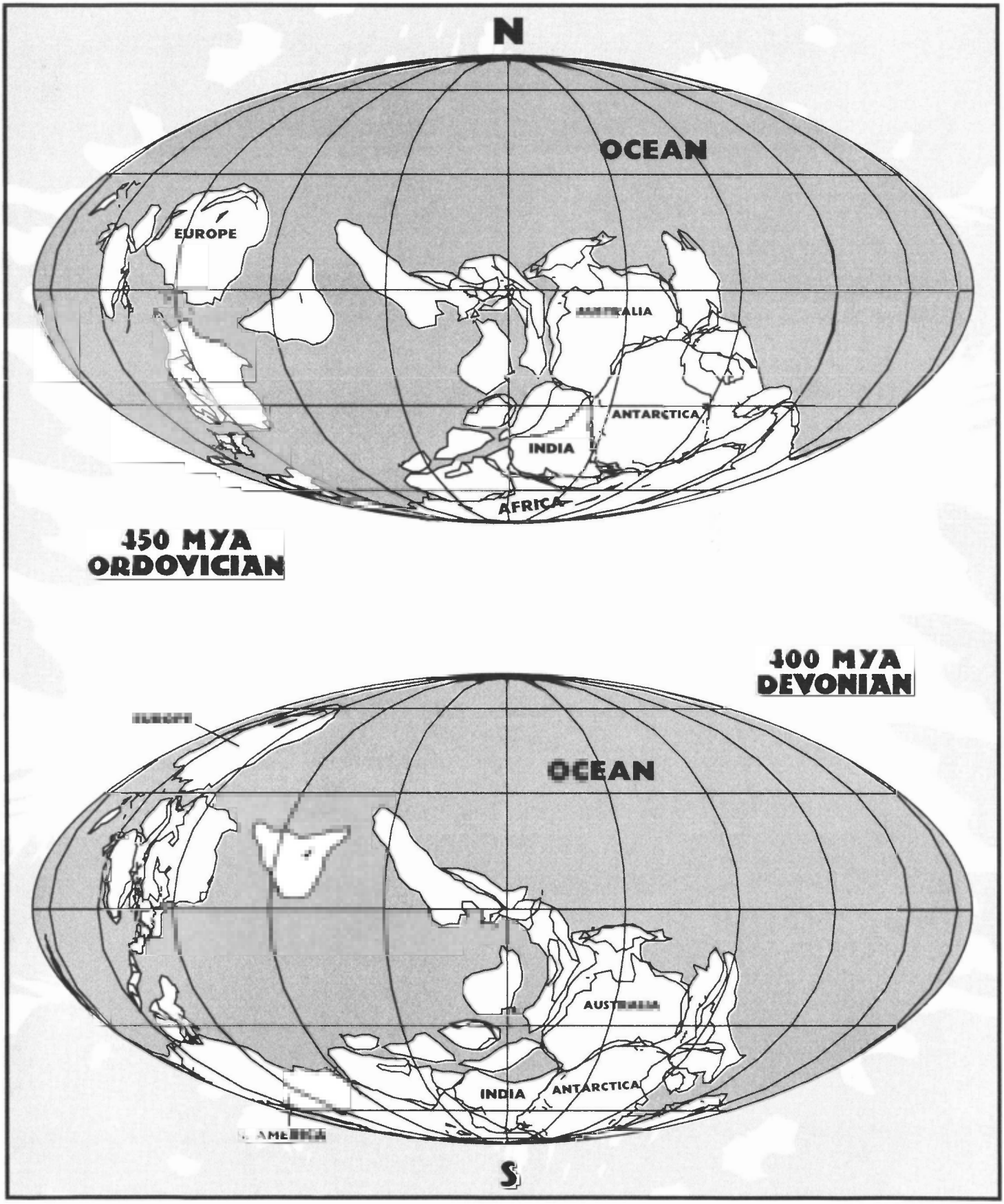
65 CENOZOIC ERA

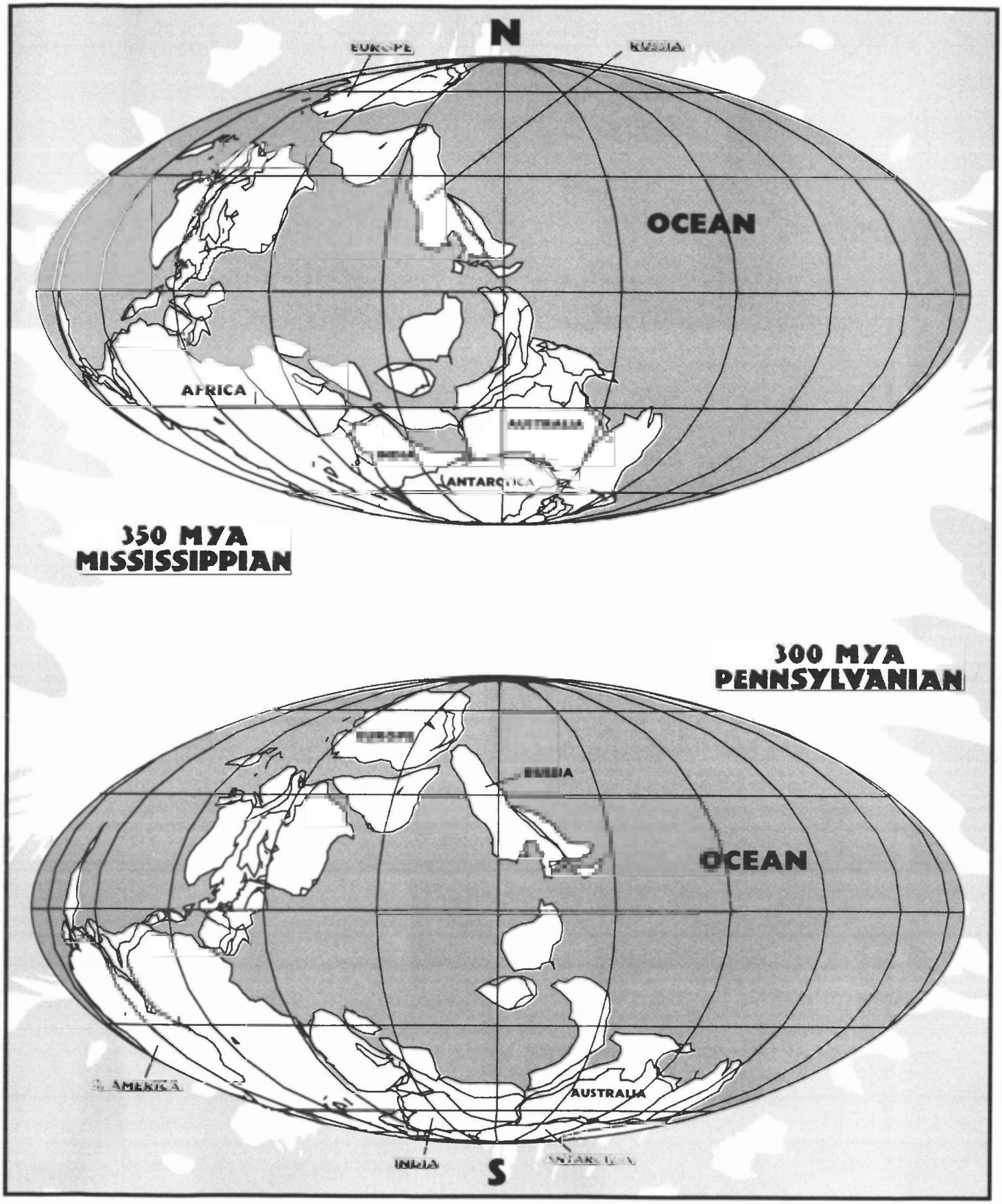
65 *Tertiary Period.*
65 *Paleocene Epoch.* First whales.
55 *Eocene Epoch.* First bats.
50 India collides with Asia, producing the Himalayas.
40 First cats.
38 *Oligocene Epoch.*
25 *Miocene Epoch.* The first apes appear.
22 First venomous snakes.
15 Morocco collides with Spain, turning the Mediterranean into a desert.
5 *Pliocene Epoch.* The Mediterranean is flooded.
4 First known hominids (*Ardipithecus*).
3 North and South America joined by land bridge.
2 *Quaternary Period. Pleistocene Epoch.* Oldest known *Homo habilis* fossils.
1.65 *Homo erectus.*
0.3 *Homo sapiens.*
0.01 Holocene (Recent) epoch begins.





Maps created by Marion Anderson, using *Terra Mobilis 2.0* by C. R. Denham and C. R. Scotese.


N
OCEAN
EUROPE
ANTARCTICA
INDIA
AFRICA
450 MYA
ORDOVICIAN
400 MYA
DEVONIAN
OCEAN
INDIA
ANTARCTICA
S


N
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OCEAN
AFRICA
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350 MYA
MISSISSIPPIAN
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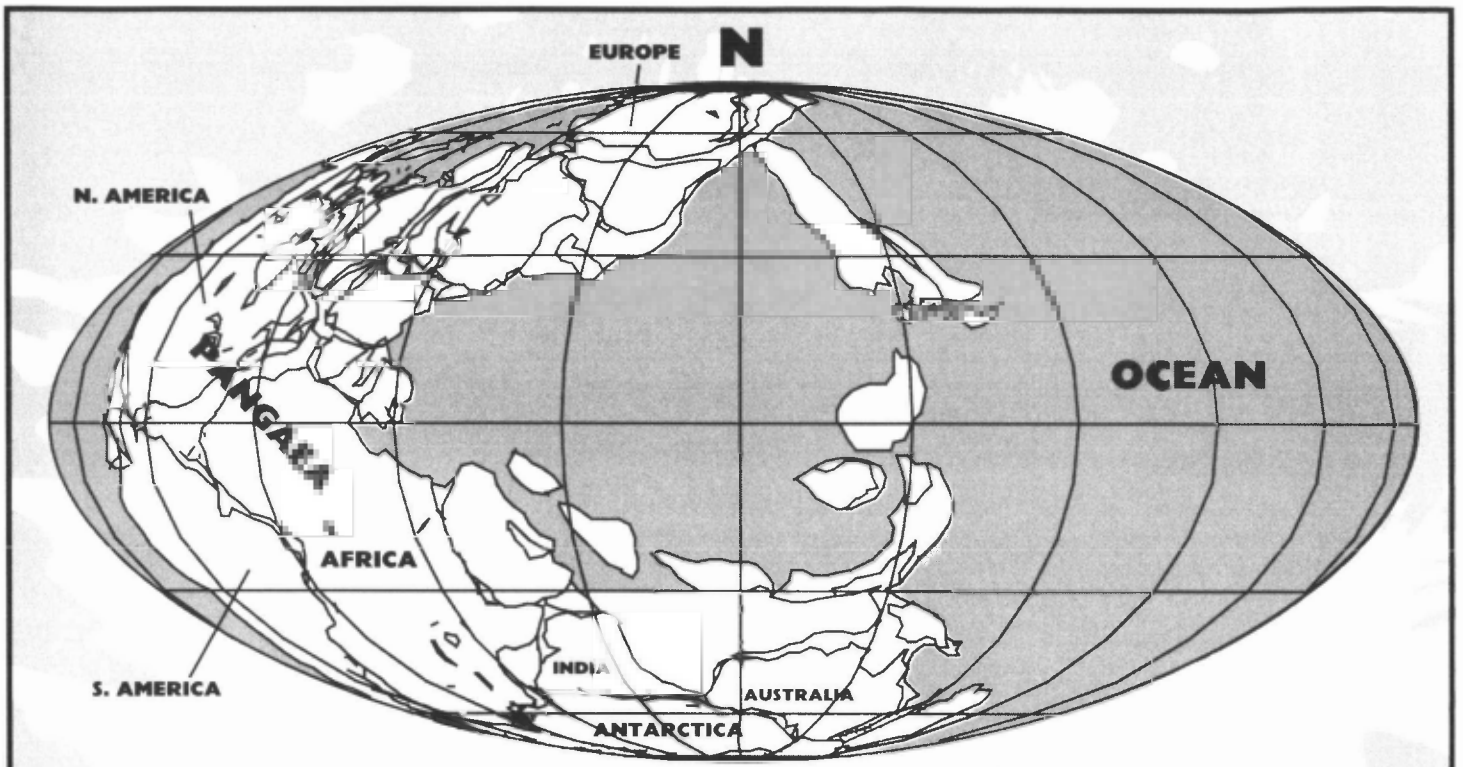
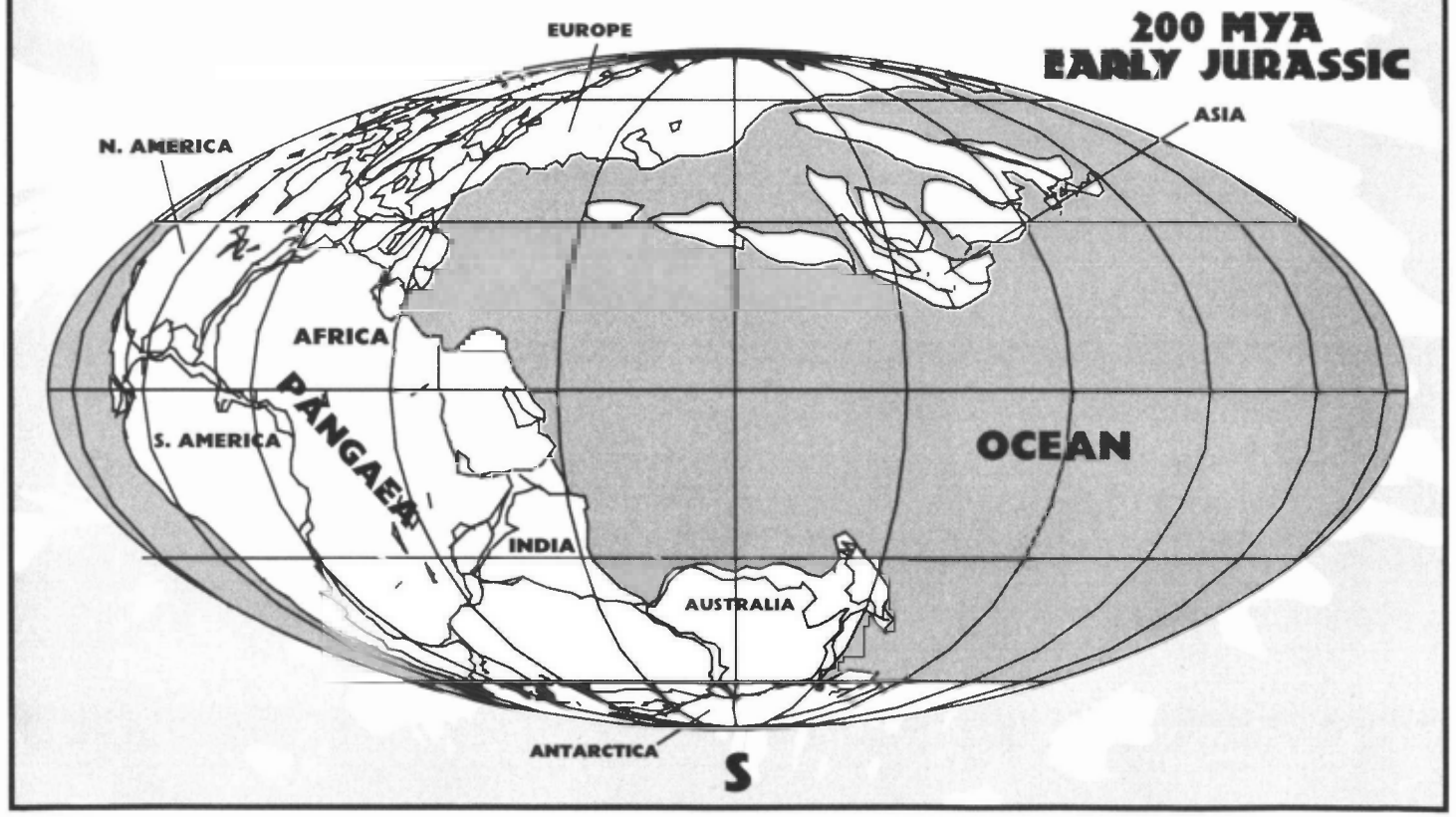
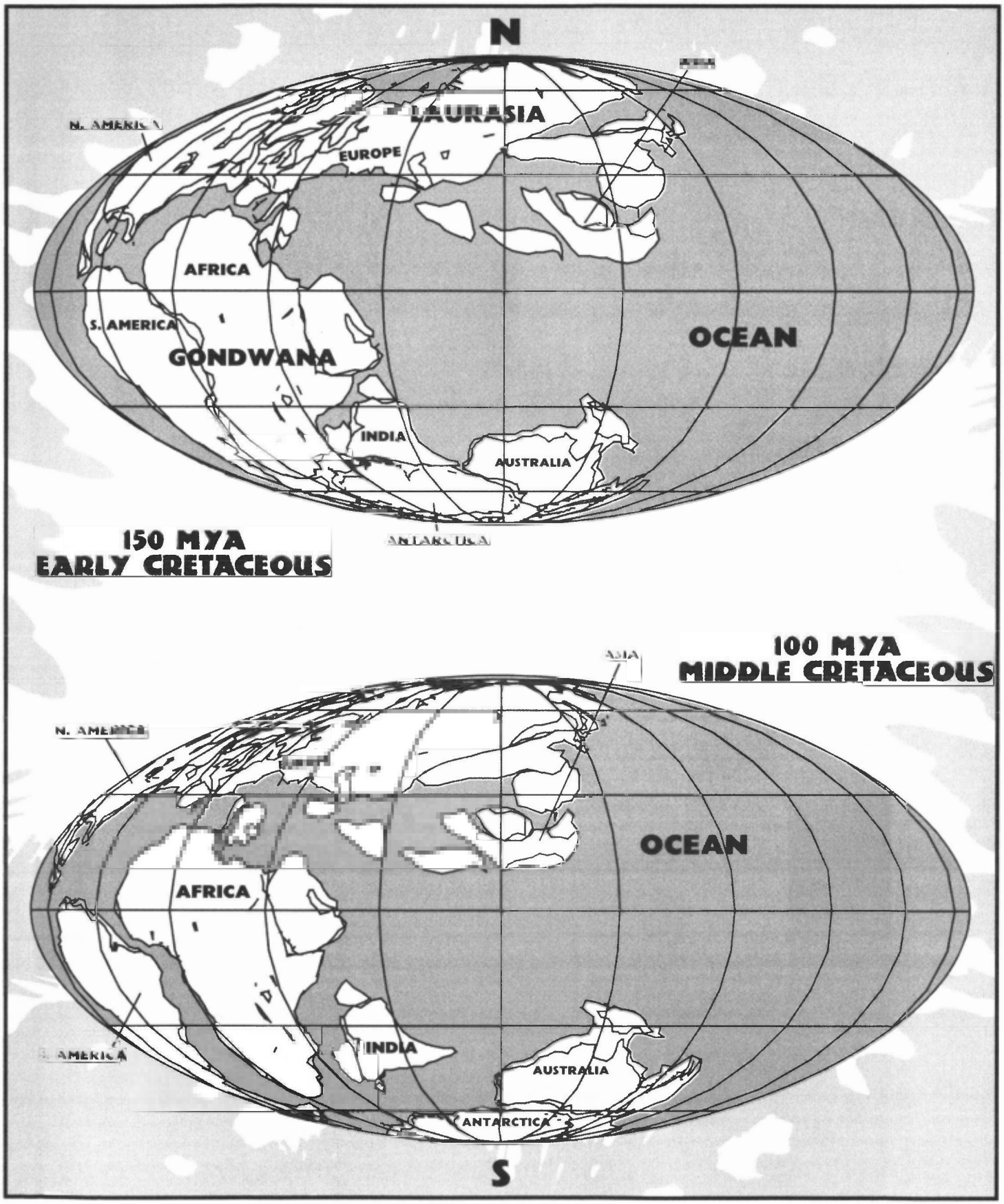
S



250 MYA
END OF PERMIAN




N
LAURASIA
EUROPE
AFRICA
S. AMERICA
GONDWANA
OCEAN
INDIA
AUSTRALIA
150 MYA
EARLY CRETACEOUS
ASIA
100 MYA
MIDDLE CRETACEOUS
N. AMERICA
OCEAN
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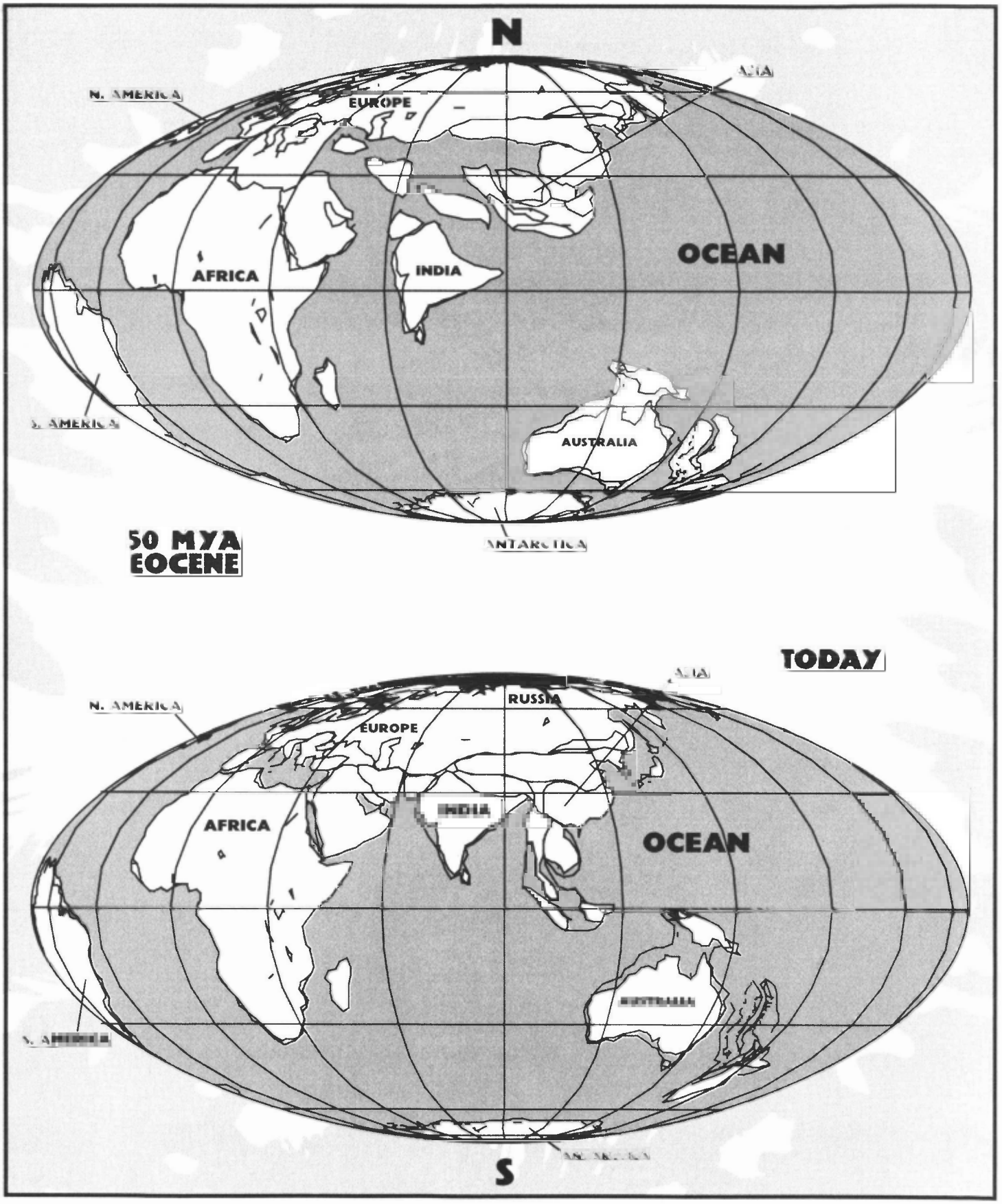
S


N
N. AMERICA
EUROPE
ASIA
AFRICA
INDIA
OCEAN
AUSTRALIA
ANTARCTICA
50 MYA
EOCENE
TODAY
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EUROPE
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INDIA
OCEAN
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S

1 PALEOZOIC

540 mya to 248 mya

The Paleozoic ("ancient life") Era spans the 340 million years from the first complex animals of the Cambrian Period to the rise of the reptiles in the Late Permian. Time travelers arriving on Earth before the Cambrian will find a "hostile terrestrial" world – hot and volcanic, with an atmosphere of nitrogen and CO_2 and sulphur compounds, plus a little oxygen during the summers only, and no ozone to block UV light. The temperature drops as life becomes more common, causing the oxygen level to rise, until the Precambrian ends with an ice age.

Though rather less hostile, the Cambrian has little to offer anyone but paleontologists. The atmosphere may not even be breathable by humans, being too rich in CO_2 but low in oxygen. (Unfortunately, air doesn't fossilize; most information about prehistoric atmospheres is based on circumstantial evidence, and GMs should feel free to ignore this if it interferes with play.) The land is barren, and the largest animal in the seas is the 4' long trilobite-munching *Anomalocaris,* a predatory arthropod with a mouth like a camera shutter and no known descendants. Survival (Island/Beach) and Fishing are useful for anyone stranded close to shore in the Cambrian; further inland, there is nothing to eat, and little that can be used for shelter. Repressive societies may use the early Paleozoic as a prison planet (as in Robert Silverberg's *Hawksbill Station*) or a testing ground for weapons too dangerous to use near civilian populations.

Sea animals grew larger throughout the Ordovician and Silurian Periods, and some land plants appeared near the shores, but not until the Devonian did plants begin to spread across the land, with moss and lichen providing ground cover and turning rocks into soil, ferns growing up to 130' tall, and horsetails the size of small trees. Weapons made from any of these plants are soft and fragile: treat as cheap quality, -1 to damage.

The Devonian Period was also the time of the first spiders, millipedes, wingless insects and amphibians. The weather was warm, the air was probably breathable without respirators, and the days approximately 21 hours long. The land was mostly flat and often swampy, and the largest animals on it were newtlike ichthyostegans up to 4 feet long. There were no flowers or butterflies, and probably nothing with the color vision to appreciate them, but at least there weren't any foot-long cockroaches – yet. (They appeared in the Mississippian.)

Larger land animals evolved in the Pennsylvanian Period, as did dragonflies, mayflies, and grasshoppers. By the late Permian, glaciers were spreading from the south pole (in what is now South Africa) across the forming supercontinent Pangaea into Africa, India, Australia, South America and Antarctica, though Europe was warm enough for reptiles to flourish. Conifers (evergreens) appeared near the end of the Paleozoic, and continued to dominate the land through most of the Mesozoic.

The wave of great extinctions at the end of the Permian was far worse than the event that killed the dinosaurs. Nearly 95% of all animal species then living – including 75% of amphibian families, more than 80% of the amniotes, and all of the trilobites – disappeared. The cause of this mass extinction is unknown, but it may have been linked to a dramatic fall in ocean levels caused by a global ice age.

Key to Animal Descriptions

ST, DX, IQ, HT. For extinct animals, IQ is a guess, based on brain size and what the fossil record tells us about their behavior (smart animals are better at avoiding tar pits and similar traps). GMs are free to change this figure (and, of course, any others) if they think it will make an adventure more playable or interesting. Animals with IQ 3+ make all Sense rolls at 14, and have Common Sense used with an effective roll of 12 (see p. CI 174); animals with IQ 6 or less should at least have Combat Reflexes.

HT will often have two numbers separated by a slash (e.g. 15/50-75). The first number is the "health" for rolling against, the second number is "hit points." ST and "hit points" are usually given as a range. DX, IQ and "health" are given as single numbers; they may vary for a point or so in either direction for any species.

Size refers to size in hexes. *Habitat*, where known, is abbreviated as follows:

A: Arctic/Antarctic
D: Desert and dry areas
F: Forest (temperate)
J: Jungle or tropical forest
P: Plains, including grasslands, steppes, etc.
S: Swamp
FW: Fresh-Water Aquatic
M: Mountain
SW: Salt-Water Aquatic

* means a special ability or attack – see text
\# indicates exceptions to the given entry – see text
\- means that the heading does not apply

Time refers to the time over which the fossil record shows the creature existed. The species may well have survived beyond that – as is evidenced by the coelacanth, which disappeared from the fossil record in the Late Cretaceous but exists today in deep Pacific waters.

Discovered refers to the year in which the species was first described (where known); it is not given for creatures that are still with us. This is included for its usefulness in time travel and lost world campaigns set in historical periods (see pp. 116-118).

Not all of the animals listed in this book would have posed any threat to humans. Some are included as a food source for early humans, and possibly stranded time-travelers and inhabitants of lost realms. Some may be riding or domestic animals in lost realms or slapstick campaigns. Many are included simply because they're interesting and the ancient world would not have been the same without them.

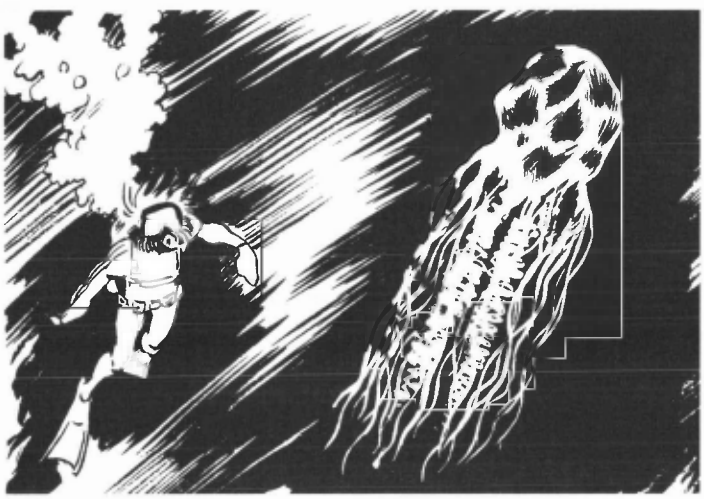
Ediacaran Fauna and the Burgess Shale

The Ediacaran fauna and Burgess Shale are the best collections of Precambrian and Cambrian fossils (respectively) yet discovered. The Ediacaran fauna are the oldest known animal fossils on Earth, showing the impressions of soft-bodied creatures from the late Precambrian. The Burgess Shale contains wonderfully detailed fossils of multicellular animals from after the Cambrian explosion – including nineteen species of trilobites, the five-eyed *Opabinia,* and the first known chordate, *Pikaia.*

The startling thing about these fossils is that most of the Ediacaran fauna do not belong to any known group and became extinct before the Cambrian, and less than a fifth of the phyla identified in the Burgess shale left any descendants that survived into the next era.

Among the strangest fossils from the Cambrian are climactichnite trackways, which look remarkably like motorcycle tire-tracks. Climactichnites were flat, soft-bodied animals about the size of a sneaker, which crawled slowly along tidal flats in search of food. They became extinct after a few million years, and, like most of the Burgess and Ediacaran creatures, left no descendants. (Of course, some of the tracks might have been made by a time-traveler with a dirt bike . . .)

Life in the Oceans



Jellyfish

Ammonite

ST: 0-4 **Speed/Dodge:** 5/6 **Size:** <1-2
DX: 12 **PD/DR:** 1/2# **Wt:** <1-20 lbs.
IQ: 2 **Damage:** *
HT: 12/1-5 **Reach:** C **Habitat:** SW
Time: Early Devonian – Late Cretaceous (408-65 mya)
Range: Worldwide

Ammonites (named after the ram-headed Egyptian god Ammon) were cephalopods with long, tightly-coiled shells. They were the most plentiful type of marine life for millions of years: some 10,000 species have been described, ranging in size from a few inches long to 13 feet.

Most of an ammonite's impressive shell is used as a flotation chamber; the living part (similar to a squid or cuttlefish, no PD or DR) occupies only the last segment.

Even a giant ammonite won't attack anything as large as a human time-traveler; if threatened, it merely squirts out a cloud of dark ink (at least as large as itself) and tries to escape. If molested, it bites, injecting poison; the beak of a large ammonite can pierce DR 1. Effects of the poison might range from a painful but harmless sting, to paralysis (and possible drowning), to sudden death: GM's option.

Jellyfish

ST: - **Speed/Dodge:** 3/0 **Size:** <1-3
DX: 9 **PD/DR:** 0/0 **Wt:** <½-10 lbs.
IQ: 2 **Damage:** *
HT: 15/2-8 **Reach:** C **Habitats:** SW, FW
Time: Precambrian – Present
Range: Worldwide

Jellyfish are among the oldest fossil creatures known, and are still found in seas and rivers worldwide. All have long tentacles filled with stinging cells. Most jellyfish stings are no more virulent than a bee-sting, but some are deadly – the sting of the sea wasp often kills swimmers before they can stagger back to shore. Jellyfish stings may do anything from 1d-4 to 3d+1 damage; anyone stung must roll HT-6 to avoid damage. Spotting a jellyfish requires a Vision roll; a DX roll is needed to avoid its stingers if it gets in range.

Placoderms (Armored Fish)

Dinichthys

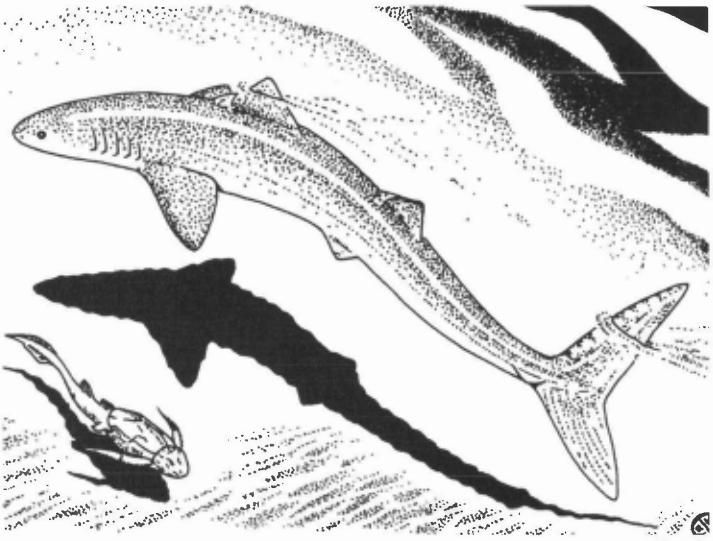
ST: 35-40 **Speed/Dodge:** 7/5 **Size:** 6-8
DX: 11 **PD/DR:** 2/4# **Wt:** 1½-2½ tons
IQ: 2 **Damage:** 2d imp/cut#
HT: 12/25-35 **Reach:** C
Time: Late Devonian (370-360 mya)
Range: Worldwide **Habitat:** SW

Titanichthys

ST: 35-40 **Speed/Dodge:** 4/5 **Size:** 8-11
DX: 10 **PD/DR:** 2/5# **Wt:** 2 ½-4 ½ tons
IQ: 2 **Damage:** 2d cut
HT: 12/30-40 **Reach:** C **Habitat:** SW
Time: Late Devonian (370-360 mya)
Range: Worldwide

Placoderms, or armored fish, are protected by large bony plates covering their heads and the front part of their bodies; the rest of their bodies to the tail are unarmored (PD 0, DR 1) and flexible. Instead of teeth, they have sharp-edged plates designed for crushing hard-shelled creatures: *Dinichthys* (18' to 25' long) also has fang-like picks at the fronts of its jaws for holding and piercing prey while the plates chopped it up. A *Dinichthys* does 2d impaling damage with the first bite, then 2d cutting damage every turn after that until the victim escapes or dies. To escape, the victim must win a contest of ST.

The larger (up to 33' long) and slower *Titanichthys* lacks these fang-like picks, and eats mostly shellfish, smaller slow-moving placoderms, and carrion. The placoderms are the top predators of their time; large sharks didn't appear until millions of years later.



Shark

Sea Scorpion (Eurypterid)

ST: 11-14 **Speed/Dodge:** 3/5 **Size:** 3-4
DX: 11 **PD/DR:** 3/4# **Wt:** 150-250 lbs.
IQ: 2 **Damage:** 1d-2 imp#
HT: 14-18 **Reach:** C **Habitats:** SW, FW
Time: Ordovician – Carboniferous (500-200 mya)
Range: Worldwide

Sea scorpions, ancestors of modern spiders, live in both salt and fresh water at depths of up to 30 feet. They are short-legged slow-swimming bottom-feeders, with well-protected gills which enable them to survive short periods on land. They grow to 10' long or more.

Sea scorpions are fierce predators, eating trilobites and other arthropods, including each other: PCs are unlikely to encounter more than one large one at a time. They attack by grasping with their pincers for 1d-1 crushing damage, then bring their prey to their mouths to be bitten (contest of ST with victim). Their bite does 1d+1 cutting damage.

If threatened or stepped on, sea scorpions lash out with their tail spines, which can sting anything in their own hex or any of their back hexes. Damage is 1d-2 impaling, and some species may have venom sacs (this is speculation, but certainly not impossible). Typical venom does 2d damage immediately if the victim fails a roll against HT-2, 1 point if the roll is successful.

Sharks

Shark, Large

ST: 40-50 **Speed/Dodge:** 9/6 **Size:** 5-10
DX: 12 **PD/DR:** 1/1# **Wt:** ½-5 tons
IQ: 3 **Damage:** 2d+1 cut **Habitat:** SW
HT: 12/35-45 **Reach:** C
Time: Early Mississippian (350 mya) – Present
Range: Worldwide

Shark, Medium

ST: 24-30 **Speed/Dodge:** 9/6 **Size:** 3-5
DX: 13 **PD/DR:** 1/1# **Wt:** 400-1,600 lbs.
IQ: 3 **Damage:** 2d-2 cut
HT: 12/20-25 **Reach:** C **Habitats:** SW, FW
Time: Late Silurian (410 mya) – Present
Range: Worldwide

Sharks are one of evolution's greatest success stories. They have been dominant predators of the seas for nearly 400 million years. Many early sharks were small, living mostly in fresh water, and looked quite bizarre, but apart from a blunter snout, fewer scales and slightly different fins, the late Devonian shark *Cladoselache* was almost identical to its modern descendants. Sharks the size of the Great White (20' to 30' long, with jaws over 3' wide), first appeared in the early Pennsylvanian.

Sharks will try to eat anything that isn't big enough to eat them, including each other – or even parts of themselves, during a "feeding frenzy." Frenzies are caused by the taste of blood in the water; treat as Berserk (p. B24), all-out attacking every turn until there is nothing left to eat. Sharks also Berserk if wounded. Shark attacks on humans are rare, and usually involve only one bite: apparently, sharks don't care for the taste of humans, particularly wet-suited humans. They attack suddenly from below (or above if the victim is a diver), removing a large chunk of flesh in a single bite. Very large sharks even attack boats.

A large amount of blood in the water may attract a pack of sharks: they can scent blood from 1,000 yards away (Smell/Taste rolls at 16; Vision and Hearing rolls at 9).

Trilobite

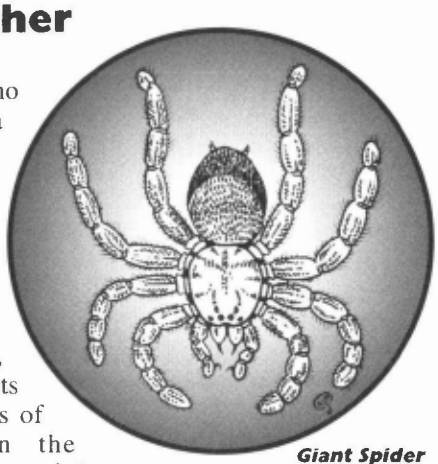
ST: 1-6 **Speed/Dodge:** 3/6 **Size:** <1
DX: 13 **PD/DR:** 0/1 **Wt:** <1-20 lbs.
IQ: 2 **Damage:** *
HT: 12/1-4 **Reach:** C **Habitat:** SW
Time: Early Cambrian – Late Permian (570-286 mya)
Range: Worldwide

Trilobites are arthropods, related (but not directly ancestral) to insects, crabs and lobsters. They range in size from a fraction of an inch to three feet long, and live in the shallows, among coral reefs, and in the ocean depths (but never on land). Some are blind, and burrow in search of food, but most species have large compound eyes (vision rolls at 14).

Trilobites aren't venomous, and are more likely to be eaten by time travelers than the reverse (+1 to Fishing rolls because of their low IQ), but they are capable of swarming, and a few kinds might attack a bleeding swimmer. A swarm of a few hundred small trilobites does from 1 point to 1 die of damage per turn, and can be dispersed by 15 hits.

Life on Land

Insects and Other Arthropods



Giant Spider

The late Paleozoic is no place for someone with a phobia of insects or creepy-crawlies. The first arthropods to live on land were scorpions, which appeared in the Silurian. Spiders, millipedes and wingless insects first appeared in the Devonian, with the first winged insects (mayflies, with wingspans of up to 15") found in the Pennsylvanian. While some of them were giants, most of these insects were extremely similar to their modern counterparts in size as well as construction. The most notable exceptions were the Arthropleurids, which grew to a horrific six feet long.

Grasshoppers first appeared in the Pennsylvanian, and the distinctive sounds of crickets and cicadas could be heard by the Permian. The earliest known fossils of beetles, bugs, ticks and fleas also come from the Permian, but many well-known species of insect may not have appeared until the Mesozoic. The earliest known flies, mosquitos, ants, bees, wasps, and silverfish have been found in late Triassic sites; moths and butterflies may not have appeared until the Jurassic, and the oldest evidence of termites comes from the Cretaceous.

A complete listing of the *giant* bugs so beloved of B-movies (including *One Million Years B.C.* and *Caveman*) can be found in ***GURPS Bestiary.***

Arthropleurid

ST: 8-12	**Speed/Dodge:** 5/4	**Size:** 2
DX: 9	**PD/DR:** 1/1	**Wt:** 60 lbs.+
IQ: 2	**Damage:** 1d-3 cut	
HT: 11	**Reach:** C	**Habitats:** J, S

Time: Mississippian – Late Pennsylvanian (360-286 mya)
Range: Worldwide

Arthropleurids are giant multi-legged arthropods, growing to more than 6' long and nearly 2' wide. Remotely related to millipedes, they lack a venomous bite and are apparently herbivorous, though they would probably try to eat anything soft that didn't move. Anyone with a phobia of insects encountering one of these monsters needs to make a Fright Check at -6.

Cockroach, Giant

ST: 1	**Speed/Dodge:** 6/6	**Size:** <1
DX: 13	**PD/DR:** 0/0	**Wt:** <1 lb.
IQ: 2	**Damage:** 1d-5 cut	
HT: 17/1	**Reach:** C	**Habitats:** J, S, F

Time: Mississippian – Cretaceous (360-65 mya)
Range: Worldwide

Cockroaches first appeared in the Mississippian and still exist today. They have ranged in size from a fraction of an inch to 13" long, with the most common being between 3" and 6" long; stats above are for the very largest. Cockroaches are not poisonous, though a few modern species carry disease; GMs should feel free to invent infections for prehistoric cockroaches (and ticks, fleas and mosquitoes) to transmit, especially in a cinematic campaign.

Someone with Squeamishness or a phobia of insects encountering a giant cockroach must make a Fright Check at -3; -9 for a swarm.

Dragonfly, Giant

Time: Pennsylvanian – Permian (320-286 mya)
Range: Worldwide **Habitats:** S, J

Paleozoic dragonflies, the biggest true insects ever discovered, grew up to 15" long with 30" wingspans. The largest known Jurassic specimens have 7.5" wingspans (not the six feet described in the novel *Jurassic Park*). Dragonflies are harmless, though they will give a nasty scare to anyone with a phobia of insects, and might bite *hard* if you tried to catch one. Use *Giant Cockroach* statistics, above.

Megarachnae (Giant Spider)

ST: 1	**Speed/Dodge:** 6/6	**Size:** <1
DX: 13	**PD/DR:** 0/0	**Wt:** <1 lb.
IQ: 2	**Damage:** 1d-4 imp*	
HT: 14/2	**Reach:** C	**Habitat:** J

Time: Pennsylvanian (320-268 mya)
Range: S. America

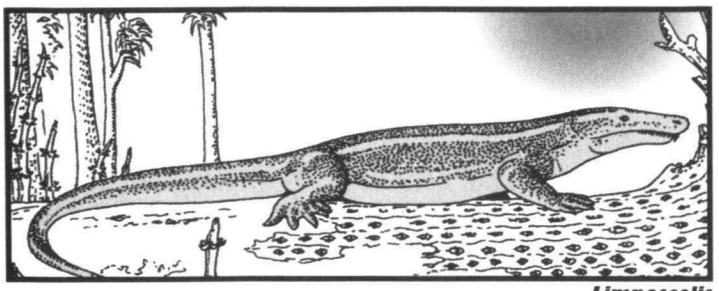
This is the largest spider yet discovered, with a leg span of 20". Little is known about its habits, but it is probably a hunter rather than a web-spinner, roaming about in search of prey, with a web strand paying out behind it. It doubles back to attack anything small enough that touches the web strand. A spider of this size could eat small amphibians, and is probably extremely venomous: something on the order of rattlesnake venom (p. B143) would be appropriate.

Anyone with a phobia of insects must make a Fright Check at -6 on encountering a *Megarachnae.*

Amphibians

Amphibians first ventured onto land some 370 million years ago, and were the largest land animals for 60 million years. All amphibians must return to water to reproduce, and many of them were primarily aquatic.

Early amphibians ranged in size from inches long to the 15' *Eogyrinus* (below). Many, such as the snake-like *Ophiderpeton* and *Phlegethonia* (2'-3' long), the boomerang-headed newt-like *Diplocaulus,* (3'-4' long), the fin-backed *Platyhystrix* (3'-4' long), and the armadillo-like armored *Peltobatrachus* (2'-3' long), were also prey for reptiles such as *Dimetrodon* and *Ophiacodon* (see below). Some may have developed glands which emit poison or a foul taste, like some modern amphibians, to deter predators.



Limnoscelis

Diadectes

ST: 10-18 **Speed/Dodge:** 6/4 **Size:** 2-3
DX: 9 **PD/DR:** 1/1 **Wt:** 200-500 lbs.
IQ: 2 **Damage:** 1d-3 cr
HT: 11/15-20 **Reach:** C **Habitats:** S, J
Time: Early Permian – Late Triassic (286-213 mya)
Range: N. America

The short-legged and bulky *Diadectes* is one of the first known herbivores, and one of the largest land animals of its time, growing up to 10' long and 3' wide. It resembles an enormous lizard without scales; its only defense against reptilian predators such as *Dimetrodon* and *Ophiacodon* is to retreat to the water.

Eogyrinus

ST: 16-20 **Speed/Dodge:** 8/6# **Size:** 4
DX: 13 **PD/DR:** 0/1 **Wt:** 200-300 lbs.
IQ: 3 **Damage:** 1d cut#
HT: 14/16-20 **Reach:** C **Habitat:** FW
Time: Early Mississippian – Middle Permian (360-260 mya)
Range: Europe **Discovered:** 1926

Eogyrinus is a long-bodied (15' with a 6' tail) but short-legged predator, similar to a crocodile but without armor. A powerful swimmer, it has Speed 1 on land (sprints at 2), and rarely leaves the swamps or rivers. It eats mostly fish and other amphibians, but might attack a human wading or swimming in its territory.

Eryops

ST: 10-18 **Speed/Dodge:** 6/5 **Size:** 2+
DX: 10 **PD/DR:** 1/2# **Wt:** 200-600 lbs.
IQ: 2 **Damage:** 1d-2 cut
HT: 11/15-20 **Reach:** C **Habitats:** S, FW
Time: Early Mississippian – Early Permian (360-270 mya)
Range: N. America
Discovered: 1887

Eryops is a thick-set, short-legged semi-aquatic predator with a large head and mouth. Its teeth are sharp but its jaw is nearly flush with the ground, requiring *Eryops* to raise its head to open its mouth. A poor swimmer, it lurks in swamps and shallow waters. Its usual prey is smaller amphibians; it would probably not attack a conscious human.

Limnoscelis

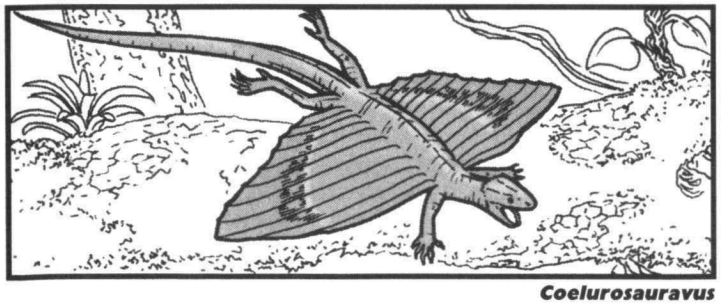
ST: 8-9 **Speed/Dodge:** 6/6# **Size:** 2
DX: 12 **PD/DR:** 1/1 **Wt:** 100-150 lbs.
IQ: 3 **Damage:** 1d-1 cut
HT: 10-14 **Reach:** C **Habitats:** S, J
Time: Pennsylvanian – Permian (320-250 mya)
Range: N. America **Discovered:** 1911

Limnoscelis is a very advanced amphibian with many reptilian features, including strong narrow jaws and long dagger-like teeth. It resembles a 6' monitor lizard, has few specializations for swimming (Speed in water is only 4), and may be able to lay eggs on land like a reptile. It eats smaller amphibians and reptiles, and will probably not attack anything as large as a human adult unless it is safely unconscious.

Reptiles and Synapsids

Reptiles evolved from amphibians in the Pennsylvanian period. The first known reptile, *Hylonomus,* resembled an 8"-long modern lizard. Reptiles and other amniotes owe their success to the eggshell, a development that enabled them to leave the water permanently. Once reptiles came to dominate the land, most amphibians returned to a fresh-water lifestyle.

Some 300 million years ago, the first so-called "mammal-like reptiles," the synapsids, evolved. During the early Permian period, synapsids (the direct ancestors of modern mammals) made up more than 70 percent of terrestrial fauna.



Coelurosauravus

Mammal-like or not, Paleozoic reptiles and synapsids were almost certainly cold-blooded and rather stupid, with poor hearing (8-10), a mediocre sense of smell (12), and no Danger Sense or Night Vision. They may have had color vision: if so, some of them may have had natural camouflage, and the finbacks may have been brightly colored.

Coelurosauravus

ST: - **Speed/Dodge:** 18/9# **Size:** <1
DX: 13 **PD/DR:** 0/0 **Wt:** <1 lb.
IQ: 3 **Damage:** *
HT: 14/3-5 **Reach:** C **Habitats:** J, D
Time: Late Permian (260-248 mya)
Range: Madagascar

Coelurosauravus is a small (16' long) insectivorous winged lizard, similar to the modern "flying dragon," *Draco volens*. Its bite does no damage; if surprised, it flies away. It can glide for 200', losing only 6' of height. Speed on the ground is 4; Dodge is 6.

Dimetrodon

ST: 16-20 **Speed/Dodge:** 7/5 **Size:** 4
DX: 10 **PD/DR:** 1/2 **Wt:** 100-250 lbs.
IQ: 3 **Damage:** 1d+1 cut
HT: 16/16-20 **Reach:** C **Habitats:** D, P, S
Time: Early – Middle Permian (270-260 mya)
Range: N. America **Discovered:** 1878

Dimetrodon ("two kinds of teeth") is a sprawling, lizard-like carnivorous synapsid. It is 10' long, with the fin or sail on its back up to 4' high. This sail might work as a solar panel, enabling *Dimetrodon* to raise its body temperature and become active earlier in the day than most of its prey, or to lower its body temperature to enable it to survive in hot environments (as elephants do with their ears).

Dimetrodon is the most common large animal in its environment, and the dominant predator of its time, chasing such large prey as *Diadectes, Eryops* and *Ophiacodon.* It kills and gorges itself rarely, and spends days or even weeks sleeping off its meals.

Edaphosaurus

Discovered: 1883

Edaphosaurus is almost identical to *Dimetrodon* in size, range and appearance (apart from a smaller head and much smaller teeth). It is herbivorous, though it may also eat mollusks. Apart from helping to regulate its temperature, its sail may be a form of mimicry to protect it from predators reluctant to attack a *Dimetrodon.* If threatened, it waddles away (Move 5); if cornered, it bites for 1d crushing damage.

Lycaenops

ST: 10-12 **Speed/Dodge:** 8/6 **Size:** 1-2
DX: 12 **PD/DR:** 1/1 **Wt:** 25-50 lbs.
IQ: 3 **Damage:** 1d-2 imp
HT: 10-12 **Reach:** C **Habitats:** D, J
Time: Late Permian (260-248 mya)
Range: Africa

Lycaenops ("wolf-face") is a lightly-built carnivorous synapsid. Three to four feet long, it resembles a monitor lizard with long, straight legs and fang-like canine teeth. The fastest runner of its time, it hunts in packs of up to 30 individuals, chasing larger and slower-moving prey such as *Moschops.*

Moschops

ST: 200+ **Speed/Dodge:** 6/5 **Size:** 10+
DX: 10 **PD/DR:** 2/3# **Wt:** 1 ton
IQ: 3 **Damage:** 3d cr#
HT: 15/55-70 **Reach:** C **Habitats:** D, J
Time: Late Permian (260-248 mya)
Range: Africa **Discovered:** 1911

Seventeen feet long and eight feet high at the shoulder, the herbivorous *Moschops* is the largest of the Paleozoic synapsids. Its thick skull (four inches thick, DR 8), powerful mammal-like back legs and sprawling forelegs are ideally suited for head-butting contests with very short run-ups. Treat this as a slam attack, costing the *Moschops* 1 point of fatigue; they are unlikely to head-butt anything as small as a human, but vehicles are another matter. They can bite for 2d crushing damage, or trample smaller predators (such as *Titanosuchus*) for 3d crushing.

Ophiacodon

ST: 4-10 **Speed/Dodge:** 6/6# **Size:** 4
DX: 12 **PD/DR:** 1/2 **Wt:** 60-110 lbs.
IQ: 3 **Damage:** 1d-2 cut
HT: 13-15 **Reach:** C **Habitats:** S, P, FW
Time: Early Permian (286-270 mya)
Range: N. America

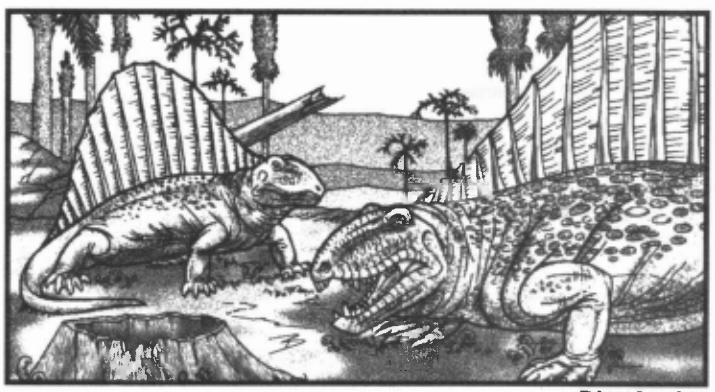
Ophiacodon is a large, lizard-like carnivore with long and powerful jaws. It grows up to 12' long – as long as a Komodo dragon, but more lightly built. A poor swimmer without the stamina for a long chase on land, it can sprint (Move 12 for two turns), or wait in ambush in shallow water (swamps or river deltas) or undergrowth for its prey – mostly smaller reptiles and amphibians. *Ophiacodon* is also prey for larger synapsids such as *Dimetrodon.*

Scutosaurus

ST: 24-30 **Speed/Dodge:** 7/5 **Size:** 3-4
DX: 10 **PD/DR:** 2/5# **Wt:** 1-3 tons
IQ: 3 **Damage:** 1d+2 cr
HT: 13/16-20 **Reach:** C **Habitat:** D
Time: Late Permian (260-248 mya)
Range: Europe **Discovered:** 1930

Scutosaurus ("shield reptile") is a massive, heavily-built reptile, armored with bony plates embedded in its skin. Its skull is also thick (DR 6) and studded with spikes, with a small frill (DR 6) protecting the neck. It grows up to 10' long and stands 7' high at the shoulder. A peaceful herbivore, it relies on its armor for defense.

Pareiasaurus is very similar to *Scutosaurus,* but with lighter armor (DR 5 over the spine and skull). It lived in African and Europe during the Middle Permian (275 mya to 260 mya).



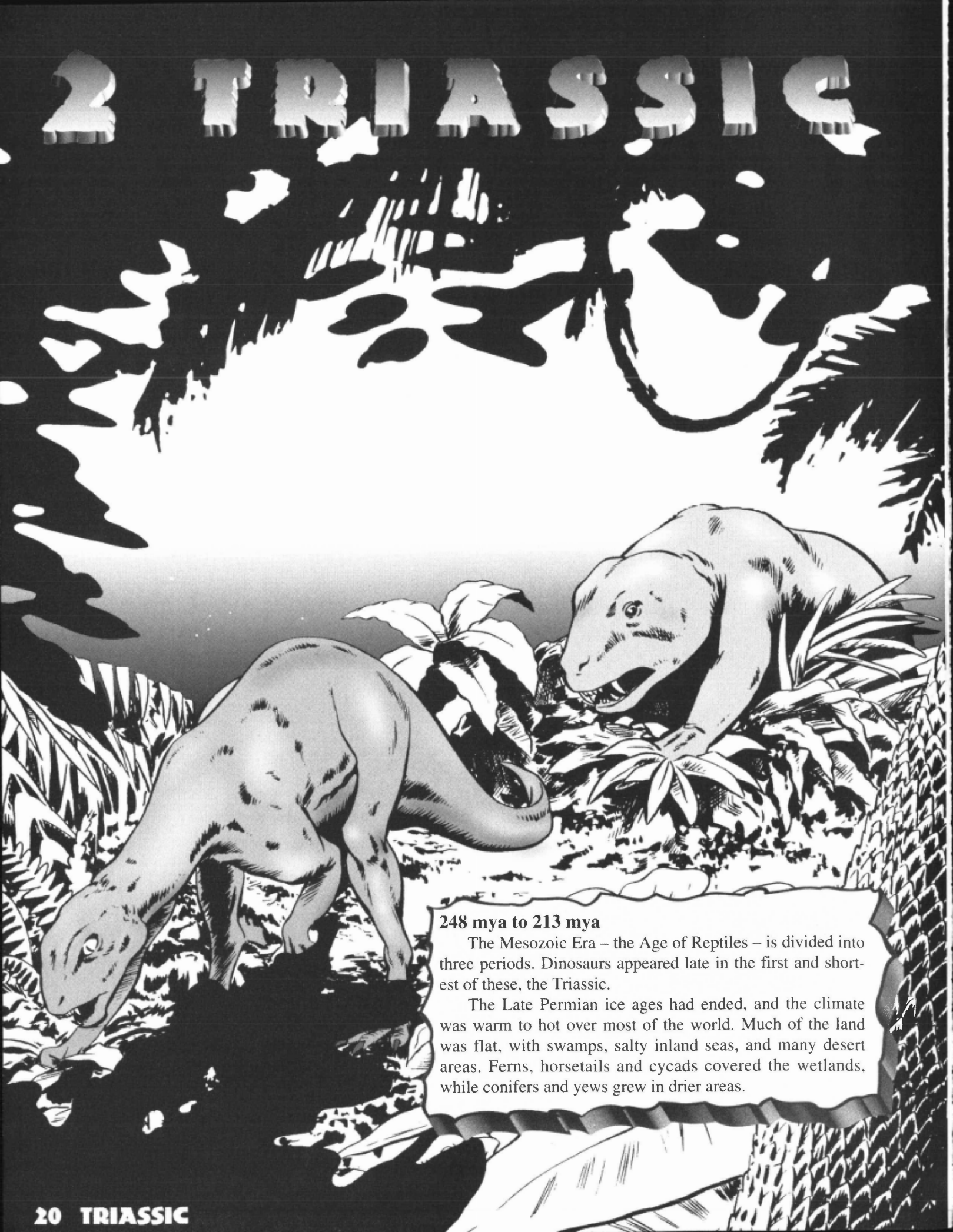
Dimetrodon

Titanosuchus

ST: 4-10 **Speed/Dodge:** 7/6 **Size:** 2-3
DX: 12 **PD/DR:** 1/2 **Wt:** 50-100 lbs.
IQ: 3 **Damage:** 1d-2 imp
HT: 12-14 **Reach:** C **Habitats:** D, J
Time: Late Permian (260-248 mya)
Range: Africa

Titanosuchus ("titanic crocodile") is neither titanic nor a crocodile, but an 8'-long lizard-like synapsid with long sharp teeth – including fangs that protrude over the edge of its snout. *Titanosuchus* preys on slow-moving thick-skinned herbivorous synapsids such as *Moschops,* ambushing them from cover.

2 TRIASSIC



248 mya to 213 mya

The Mesozoic Era – the Age of Reptiles – is divided into three periods. Dinosaurs appeared late in the first and shortest of these, the Triassic.

The Late Permian ice ages had ended, and the climate was warm to hot over most of the world. Much of the land was flat, with swamps, salty inland seas, and many desert areas. Ferns, horsetails and cycads covered the wetlands, while conifers and yews grew in drier areas.

During the Triassic, earthquakes and volcanic eruptions were commonplace Most of the earth's land was connected as the supercontinent Pangaea, stretching from pole to pole.

Triassic dinosaurs were generally smaller and less specialized than the better-known species from the Jurassic and Cretaceous. Many herbivorous prosauropods had long claws, and leaf-shaped teeth with serrated edges.

Apart from dinosaurs, the Triassic Period was also the time of pterosaurs, crocodiles, and the last "mammal-like reptiles." Ichthyosaurs and nothosaurs ruled the shallow and increasingly salty oceans, and pterosaurs took to the skies. Freshwater fish included the pike-like *Saurichthys* and the catfish-like *Hypsidoris*. Insects and other arthropods continued to thrive, with ants, wasps, bees, flies and silverfish making their first appearances in the fossil record. And toward the end of the period, the first true mammals – tiny, shrew-like creatures which probably lived on insects only slightly smaller than themselves – emerged.

Cold-Blooded Killers?

The dinosaur descriptions in this book assume that most or all dinosaurs were warm-blooded (endothermic or homeothermic), like birds and mammals, rather than cold-blooded (ectothermic or poikilothermic) like modern reptiles. Warm-blooded animals are faster and hungrier than cold-bloods, and generally make for more exciting adventures. Some of the evidence for warm-blooded dinosaurs includes:

Growth rates. Cold-blooded reptiles grow less rapidly than warm-blooded mammals. The scarcity of juvenile dinosaur fossils suggest that dinosaurs grew quickly. From a gaming point of view, this means that most dinosaurs encountered will be full-sized.

Speed. Cold-blooded animals aren't capable of sustained high speed, but many dinosaurs were built for running. For cold-blooded dino-saurs, halve the speed in the descriptions.

Evolution. Cold-blooded species such as reptiles tend to evolve slowly. Dinosaur species, however, usually survived for only two to six million years, a mere moment by evolutionary standards. Cold-blooded animals are also better at surviving mass extinctions. These factors make "lost realms" populated by familiar warm-blooded species even less likely.

Predator-prey ratios. Warm-blooded animals must eat more to stay alive, so more herbivores are needed to feed the predators. Cold-blooded meat-eaters would be much more plentiful than modern carnivores, but would need to eat less often (carnivorous dinosaur fossils are actually very rare).

GMs who prefer cold-blooded dinosaurs should halve the listed movement speeds, and halve them again at nights, or on cold or extremely hot days. The only pay-off is that carnivores will be more common, though less hungry and less inclined to chase fast-moving prey.

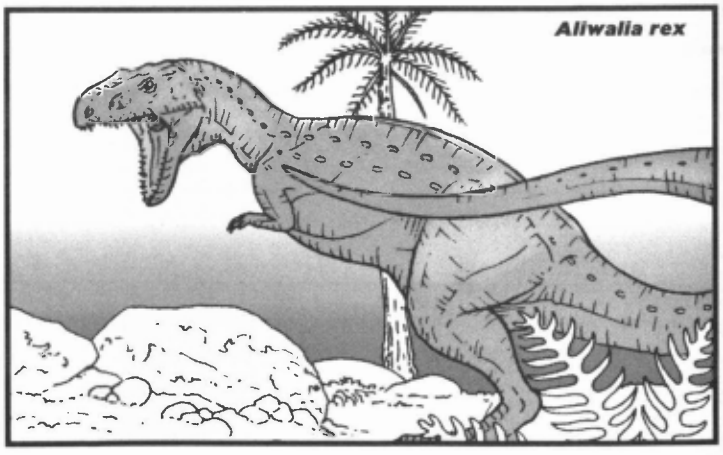
Paleontologists are still divided on this issue, which has been complicated by concepts such as "mass homeothermy" and warm-blooded juveniles growing into cold-blooded adults. GMs interested in the evidence for dinosaur warm-bloodedness are advised to read Robert Bakker's *The Dinosaur Heresies* and at least one other recent book on the subject (see the Bibliography for suggestions).

PREDATORS

Aliwalia

ST: 60-80 **Speed/Dodge:** 9/7 **Size:** 10+
DX: 14 **PD/DR:** 2/2 **Wt:** 1-2 tons
IQ: 3 **Damage:** 3d+2 cut
HT: 13/35-45 **Reach:** C, 1 **Habitat:** P
Time: Late Triassic (225-213 mya)
Range: Africa

Aliwalia rex is a 25' long theropod, which bites in close combat or 1-hex reach for 3d+2 cutting damage. It preys on the plentiful *Euskelosaurus* and other prosauropods: the only known fossils of *Aliwalia rex* were discovered in a shipment of *Euskelosaurus* bones. Its behavior is probably similar to that of *Allosaurus* (p. 29).



Coelophysis

ST: 13-15 **Speed/Dodge:** 12/7 **Size:** 2-3
DX: 15 **PD/DR:** 1/1 **Wt:** 80-150 lbs.
IQ: 3 **Damage:** 1d+1 cut#
HT: 13/12-14 **Reach:** C, 1# **Habitats:** P, F
Time: Late Triassic (225-213 mya)
Range: America **Discovered:** 1881

Coelophysis ("hollow form") is a lightly-built long-necked theropod with a small head, strong jaws, and sharp teeth doing 1d+1 cutting damage. Its forearms are also long and powerful, and end in large taloned hands which rake for 1d cutting at 1-hex reach. It grows up to 9' long, and stands 4' to 5' tall.

Coelophysis travels in large packs: hundreds of *Coelophysis* fossils, ranging from hatchlings to full-grown adults, have been found in one "dinosaur graveyard" at Ghost Ranch. All were apparently killed and preserved by one catastrophe (probably a flood). Evidence of solitary *Coelophysis* has also been discovered, so any number (i.e., as many as the GM wants) may be encountered at one time.

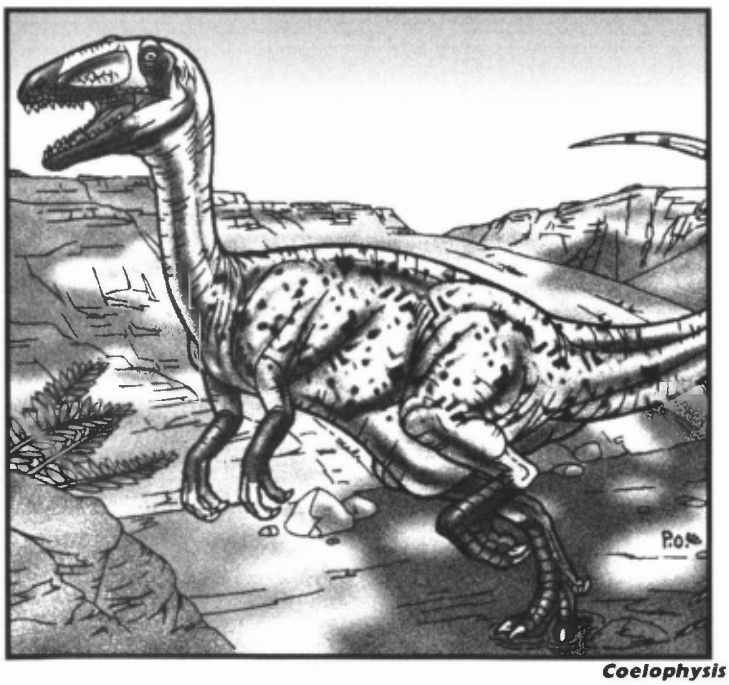
Coelophysis eat any prey they can catch, including the young of other *Coelophysis*. Their long snake-like necks are also admirably suited for eating carrion, and a few dozen *Coelophysis* can make short work of the largest dinosaur carcasses.

A solitary *Coelophysis* might not attack humans, but time travelers who stand between a large pack and food are in grave danger.

Crocodiles

Chasmatosaurus

ST: 8-9 **Speed/Dodge:** 8/7# **Size:** 2-3
DX: 14 **PD/DR:** 2/3# **Wt:** 100-200 lbs.
IQ: 3 **Damage:** 1d-1 cut#
HT: 10-14 **Reach:** C# **Habitats:** S, FW
Time: Early Triassic (248-230 mya)
Range: Africa, Asia



Coelophysis

Crocodile

ST: 18-30 **Speed/Dodge:** 8/7# **Size:** 3-10
DX: 14 **PD/DR:** 3/4# **Wt:** 900-3,000 lbs.
IQ: 3 **Damage:** 1d+2 cut#
HT: 13/20-30 **Reach:** C# **Habitats:** S, FW, SW
Time: Middle Triassic (230 mya) – Present
Range: Worldwide

Rutiodon

ST: 16-20 **Speed/Dodge:** 8/7# **Size:** 4
DX: 14 **PD/DR:** 3/4# **Wt:** 200-350 lbs.
IQ: 3 **Damage:** 1d cut#
HT: 14/14-18 **Reach:** C# **Habitat:** FW
Time: Late Triassic (225-213 mya)
Range: Europe, N. America

Crocodiles and alligators are archosaurs ("ruling reptiles"), the only other surviving members of the superorder which includes the dinosaurs, pterosaurs, and birds.

Adult crocodiles range from 6' to 30' long, depending on their species, with the average being 13' to 16'. They feed mainly on fish, but also catch animals (and sometimes humans) that come to the water to drink; they attack by grabbing and holding with their teeth, and attempt to drown their victims by pulling them under water. Prying open their jaws requires a regular Contest of ST. To hold them *shut*, however, requires a Contest of ST versus only one-quarter of the crocodile's ST.

If fighting on land (usually to defend their nests, of which they are extremely protective), they attack by biting and by whipping with their tails. The tail-whip has Reach 1, for thrust-1 crushing damage; it can easily break human legs, and is intended to knock opponents to the ground so they can more easily be bitten.

On land, a crocodile normally has Speed 2, but can sprint for short distances at Speed 4. In water, its Speed is 8. It has PD 3, DR 4 everywhere except its underbelly, which has PD1, DR 2.

Chasmatosaurus is the earliest known crocodile-like reptile, a small (6' to 7' long), lightly armored, sharp-toothed proterosuchian similar to the fresh-water crocodiles still found in Australia.

Rutiodon is not a true crocodile, but a long-snouted fish-eating phytosaur. It is almost identical to the modern Indian gavial except for the placement of its nostrils (near the eyes; chasmatosaurs and true crocodiles have them at the tip of the snout).

Cynognathus

ST: 11-13 **Speed/Dodge:** 7/6 **Size:** 1-2
DX: 11 **PD/DR:** 1/1 **Wt:** 35-70 lbs.
IQ: 3 **Damage:** 1d imp
HT: 10-12 **Reach:** C **Habitats:** P, D
Time: Early Triassic (248-230 mya)
Range: Africa, S. America

Cynognathus ("dog jaw") is a heavily-built synapsid, similar to a wolverine in appearance. Its skull is nearly a third of the length of its body, and its jaws are very heavily muscled, able to open wide and bite for 1d impaling damage. *Cynognathus* preys on other mammal-like reptiles, including the larger *Kannemeyeria* (see p. 24). It will probably attack time travelers without hesitation.

Eoraptor

ST: 3-5 **Speed/Dodge:** 9/7 **Size:** 1
DX: 14 **PD/DR:** 0/0 **Wt:** 7-10 lbs.
IQ: 3 **Damage:** 1d-3 cut
HT: 14/6-8 **Reach:** C **Habitat:** P
Time: Late Triassic (228 –213 mya)
Range: S. America **Discovered:** 1993

Eoraptor, a 3' long biped with small forearms, is one of the earliest dinosaurs known. It has the serrated teeth of a theropod, but lacks the hinged lower jaw that enables theropods to swallow large prey whole. It eats all kinds of animal material, anything it can get its nimble claws on and run away with – including carrion, eggs, and small animals. It bites for 1d-3 cutting damage. Despite its name, it has no "raptor claw."

Erythrosuchus

ST: 55-60 **Speed/Dodge:** 7/5 **Size:** 10
DX: 10 **PD/DR:** 2/2 **Wt:** ½-3 tons
IQ: 3 **Damage:** 3d cut
HT: 15/55-70 **Reach:** C **Habitats:** P, D
Time: Early Triassic (248-230 mya)
Range: Africa

Erythrosuchus is a heavily-built quadruped, 15' to 16' in length, with a skull 3' long. It is not a dinosaur . . . it is more closely related to *Chasmatosaurus*. It bites at close range for 3d cutting damage, and preys on heavily-armored herbivorous reptiles.

Herrerasaurus

ST: 20-24 **Speed/Dodge:** 10/7 **Size:** 3-5
DX: 14 **PD/DR:** 1/1 **Wt:** 500-1,500 lbs.
IQ: 3 **Damage:** 1d+1 cut
HT: 12/20-26 **Reach:** C, 1# **Habitat:** P
Time: Late Triassic (228-213 mya)
Range: America **Discovered:** 1963

Herrerasaurus is an early predatory dinosaur, a probable ancestor of *Allosaurus* and *Tyrannosaurus*. At least 12' long, it is one of the largest predators of its time, and fast enough to run down any herbivores in its world. Its forearms are longer than those of most later theropods, enabling it to grapple (see p. B111) large herbivores such as *Riojasaurus*. Its taloned feet may be used to pin down smaller prey (Contest of ST), or trample for 1d-1 crushing damage. Its double-hinged jaws enable it to swallow lumps of meat larger than its own head, and its 2" long serrated teeth inflict 1d+2 cutting damage.

Herrerasaurus has acute hearing (Hearing-15). Unlike later, larger theropods, it is likely to consider human-sized prey large enough to be worth the effort of chasing.

Liliensternus

Time: Late Triassic (222 –219 mya)
Range: Europe **Habitat:** P
Discovered: 1984

Liliensternus is a 16' long predator which may have had a crested skull similar to that of *Dilophosaurus*. Use *Herrerasaurus* statistics.

Staurikosaurus

ST: 14-17 **Speed/Dodge:** 14/7 **Size:** 2-3
DX: 14 **PD/DR:** 1/1 **Wt:** 100-200 lbs.
IQ: 3 **Damage:** 1d cut
HT: 13/12-14 **Reach:** C
Time: Late Triassic (231-225 mya)
Range: S. America **Habitat:** P
Discovered: 1970

Staurikosaurus is a lightly built herrerasaurid, 7' long with small forelimbs, long hind legs, and a long tail. It has no killing claws, but bites for 1d cutting damage.

Ticinosuchus

ST: 16-20 **Speed/Dodge:** 9/7 **Size:** 4
DX: 14 **PD/DR:** 2/3# **Wt:** 200-300 lbs.
IQ: 3 **Damage:** 1d-1 cut
HT: 14/14-18 **Reach:** C **Habitat:** FW
Time: Middle Triassic (230 -225 mya)
Range: Europe

Ticinosuchus is a lightly armored archosaur, resembling a short-snouted, long-legged crocodile. It grows up to 10' long, and is built for running on land. Its back is PD 2, DR 3; elsewhere, it is PD 1, DR 2. It bites for 1d-1 cutting damage at close range.

Herbivores

Desmatosuchus

ST: 18-30 **Speed/Dodge:** 5/7 **Size:** 3-6
DX: 14 **PD/DR:** 3/5 **Wt:** 500-700 lbs.
IQ: 3 **Damage:** 2d cr#
HT: 13/20-30 **Reach:** C, 1
Time: Late Triassic (248-230 mya)
Range: N. America **Habitats:** P, S

Desmatosuchus is not a dinosaur, but a fairly close relative. It resembles a heavily-armored crocodile with a small snout and sharp, horn-like curved spikes projecting up and out from its shoulders . . . but it is a herbivore, with weak, peglike teeth, and lives on land.

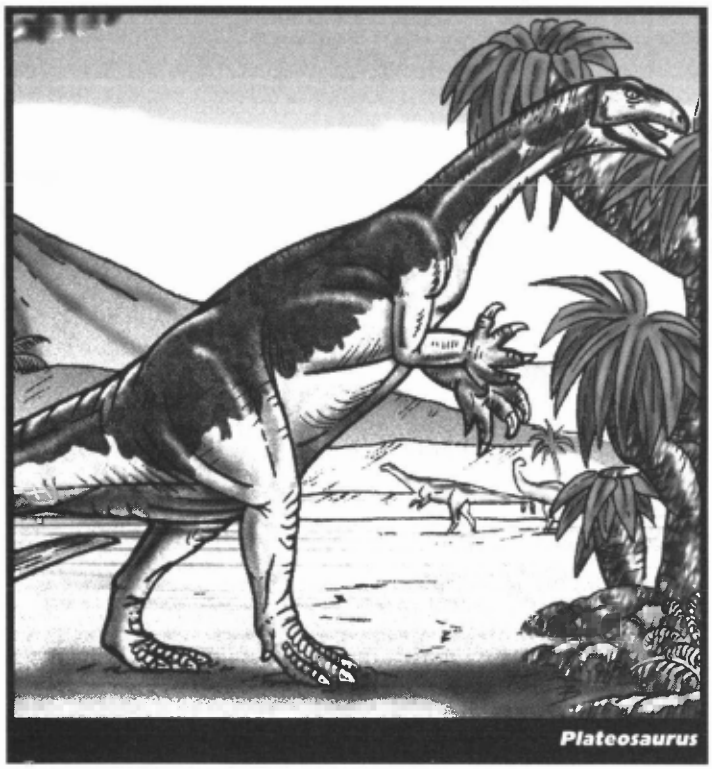
If attacked, *Desmatosuchus* whips with its tail like a crocodile; Reach is 1, Damage is 2d crushing. Anyone knocked down by this attack should roll DX; on a critical failure, they fall onto one of the spikes, taking 2d impaling damage.

Euskelosaurus

ST: 40-50 **Speed/Dodge:** 6/5 **Size:** 10-12
DX: 10 **PD/DR:** 1/1 **Wt:** 1½-2 tons
IQ: 3 **Damage:** 3d cr
HT: 15/35-45 **Reach:** 1-3# **Habitats:** F, P
Time: Late Triassic (220-215 mya)
Range: Africa **Discovered:** 1866

The 30' long *Euskelosaurus* is one of the largest known prosauropods. A long-necked, heavy-bodied, small-headed quadruped, it resembles later sauropods such as *Apatosaurus*. It lacks the long claws of more lightly built prosauropods (including *Plateosaurus* and *Massospondylus*, below), but tramples for 1d+2 crushing damage. Its tail has a 3-hex reach, and does 3d crushing damage. It is plentiful, and probably travels in large herds.

Smaller prosauropods similar to the early Jurassic *Anchisaurus* (p. 36) were probably common during the Triassic; *Anchisaurus* stats can also be used for juvenile *Euskelosaurus* and other prosauropods.



Heterodontosaurus

ST: 3-5 **Speed/Dodge:** 10/7 **Size:** 1
DX: 14 **PD/DR:** 0/0 **Wt:** 20-40 lbs.
IQ: 3 **Damage:** 1d-4 imp#
HT: 13/5-7 **Reach:** C **Habitats:** P, F
Time: Late Triassic – Early Jurassic (225-200 mya)
Range: Africa **Discovered:** 1962

Heterodontosaurus is a 3' long herbivorous dinosaur with upward-pointing tusks and stabbing canine teeth in the front of its mouth. These, like its strong clawed fingers, are used for digging up roots as well as defense: the rest of its teeth are better suited to chopping up plants rather than meat. It may be an omnivore, eating insects and small animals as well as plants, or an aggressive vegetarian like the wild boar. It can rake with its claws for 1d-3 cutting, or bite for 1d-4 impaling.

Heterodontosaurus can sprint on its slender hind legs, or walk on all fours while cropping plants. Its eyes are relatively large (Vision-14), and it may have the Night Vision advantage.

Kannemeyeria

ST: 24-30 **Speed/Dodge:** 6/5 **Size:** 3-4
DX: 10 **PD/DR:** 1/2 **Wt:** 1-3 tons
IQ: 3 **Damage:** 1d+2 cut
HT: 13/16-20 **Reach:** C **Habitats:** P, D
Time: Early Triassic (248-230 mya)
Range: Africa, Asia, S. America

Kannemeyeria is a heavily-built, rather pig-like herbivorous therapsid (an advanced synapsid), with short but powerful legs. It grows up to 10' long, and stands 4' high. It has large eyes and nostrils (Vision-15, Smell-15), and a powerful beak which bites at close range for 1d+2 crushing damage.

Massospondylus

ST: 20-30 **Speed/Dodge:** 6/5 **Size:** 4-8
DX: 10 **PD/DR:** 1/1 **Wt:** 600-1,200 lbs.
IQ: 3 **Damage:** 1d+2 cr#
HT: 14/20-30 **Reach:** C, 1# **Habitats:** F, P
Time: Late Triassic – Early Jurassic (225-194 mya)
Range: Africa, N. America **Discovered:** 1854

Massospondylus is a moderate-sized, lightly-built prosauropod; adults range in length from 12' to 20', with neck and tail each making up a third of this. It resembles a small *Diplodocus*, but its front and hind feet have long toes with large claws; if threatened, it stands on its hind legs and claws at 1-hex range for 1d+2 crushing damage. It has a small, narrow head, with large eyes and nostrils: make vision and smell rolls at 14.

Plateosaurus

ST: 30-40 **Speed/Dodge:** 6/5 **Size:** 9-12
DX: 11 **PD/DR:** 1/1 **Wt:** 1,500-2,000 lbs.
IQ: 3 **Damage:** 2d+2 imp#
HT: 15/30-40 **Reach:** C, 1, 2# **Habitats:** F, P, D
Time: Late Triassic (222-219 mya)
Range: Europe **Discovered:** 1837

Plateosaurus is, at 28' long, one of the largest prosauropods; a long-necked, heavily-built quadruped, with long forearms, strong hind legs, and a small skull with a long snout filled with spoon-shaped teeth. Its feet are clawed, with the first finger of each front foot held clear of the ground to keep its claw sharp.

If threatened, *Plateosaurus* rears up on its hind legs and slashes with this scythe-like claw, doing 2d+2 impaling damage with a 2-hex reach. An adult is at -4 to hit a human-sized target, but will probably ignore anyone who does not molest it.

Plateosaurus is one of the most common European dinosaurs, and probably travels in family groups or small herds.

Riojasaurus

ST: 50-60 **Speed/Dodge:** 5/0 **Size:** 18+
DX: 10 **PD/DR:** 1/1 **Wt:** 2-3 tons
IQ: 3 **Damage:** 2d+2 cr
HT: 15/30-40 **Reach:** 1-3# **Habitats:** F, P
Time: Late Triassic (225-219 mya)
Range: S. America **Discovered:** 1969

Riojasaurus is a 36' long, heavily-built, long-necked prosauropod herbivore, very similar to *Euskelosaurus* in most regards.

PTEROSAURS

Pterosaurs are winged archosaurs ("ruling reptiles"), closely related to dinosaurs and crocodiles. They are not ancestors of birds; their wings are very different in construction, and early species have toothed beaks and long tails. (Birds are descended from dinosaurs, or possibly from an ancestor of the dinosaurs).

The earliest known pterosaurs date back to the early Triassic, approximately 230 million years ago. They eat insects and/or fish, and ranged from the pigeon-sized *Preondactylus* (known only from a jumble of fossil bones vomited by some aquatic predator) to *Eudimorphodon,* below.

Some pterosaurs may have fur, but neither naked, batlike skin nor feathers is out of the question. Many probably have bright colors or striking patterns, like modern birds.

Eudimorphodon

ST: 2-3 **Speed/Dodge:** 11/7 **Size:** <1-1
DX: 14 **PD/DR:** 0/0 **Wt:** 3-10 lbs.
IQ: 3 **Damage:** 1d-5 imp
HT: 14/2-3 **Reach:** C **Habitat:** #
Time: Early – Late Triassic (231-213 mya)
Range: Europe **Discovered:** 1973

Eudimorphodon is a fish-eating pterosaur with a 3' wingspan, a 3" skull filled with sharp teeth, a long rudder-like tail, and strong claws on its wings. The claws enable it to climb trees (like the modern hoatzin) or hang onto seaside cliff faces. It will not attack anything as large as a human, except perhaps in defense of its nest. Running on the ground on all fours, its Speed is 2, Dodge is 5.

Pterosaurs

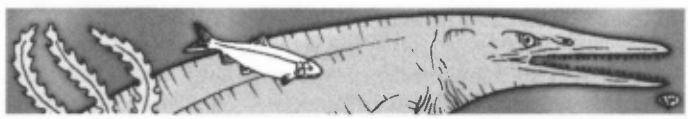
THE TRIASSIC OCEANS

The Triassic seas are still home to many Paleozoic species, including ammonites, and a wide variety of fish, as well as marine reptiles (not dinosaurs). Ichthyosaurs ("fish lizards") were the reptilian equivalents of dolphins and small whales – entirely adapted to a life at sea, but still needing to come to the surface to breathe. The long-necked nothosaurs were more seal-like, and able to rest on shore.

Cymbospondylus

ST: 35-45 **Speed/Dodge:** 8/6 **Size:** 8-11
DX: 12 **PD/DR:** 1/1 **Wt:** 1-3 tons
IQ: 3 **Damage:** 2d cut
HT: 12/25-35 **Reach:** C **Habitat:** SW
Time: Middle Triassic (230-225 mya)
Range: America

Cymbospondylus is a large, serpentine ichthyosaur, growing up to 33' long. Unlike most ichthyosaurs, it has no fin on its back, and its tail is long and snake-like, rather than fishlike. Its snout is relatively short, but it can still bite for 2d cutting damage.



Nothosaurus

ST: 16-20 **Speed/Dodge:** 8/7 **Size:** 3-5
DX: 14 **PD/DR:** 1/1 **Wt:** 200-300 lbs.
IQ: 3 **Damage:** 1d-1 cut
HT: 14/14-18 **Reach:** C, 1 **Habitat:** SW
Time: Early – Late Triassic (248-213 mya)
Range: Northern Hemisphere **Discovered:** 1834

Nothosaurus is an early marine reptile, ranging from 10' to 14' long. It resembles a plesiosaur, except for its legs, which end in webbed feet rather than large flippers. Unlike the plesiosaurs, it lays eggs on land.

It has Speed 8 in the water, Speed 1 on land, but can probably "sprint" for short distances at Speed 2. Its neck is long and flexible, giving it a reach of 1. It eats fish, and bites for 1d-1 cutting damage.

Pistosaurus

Time: Middle Triassic (230-225 mya)
Range: Europe **Habitat:** SW

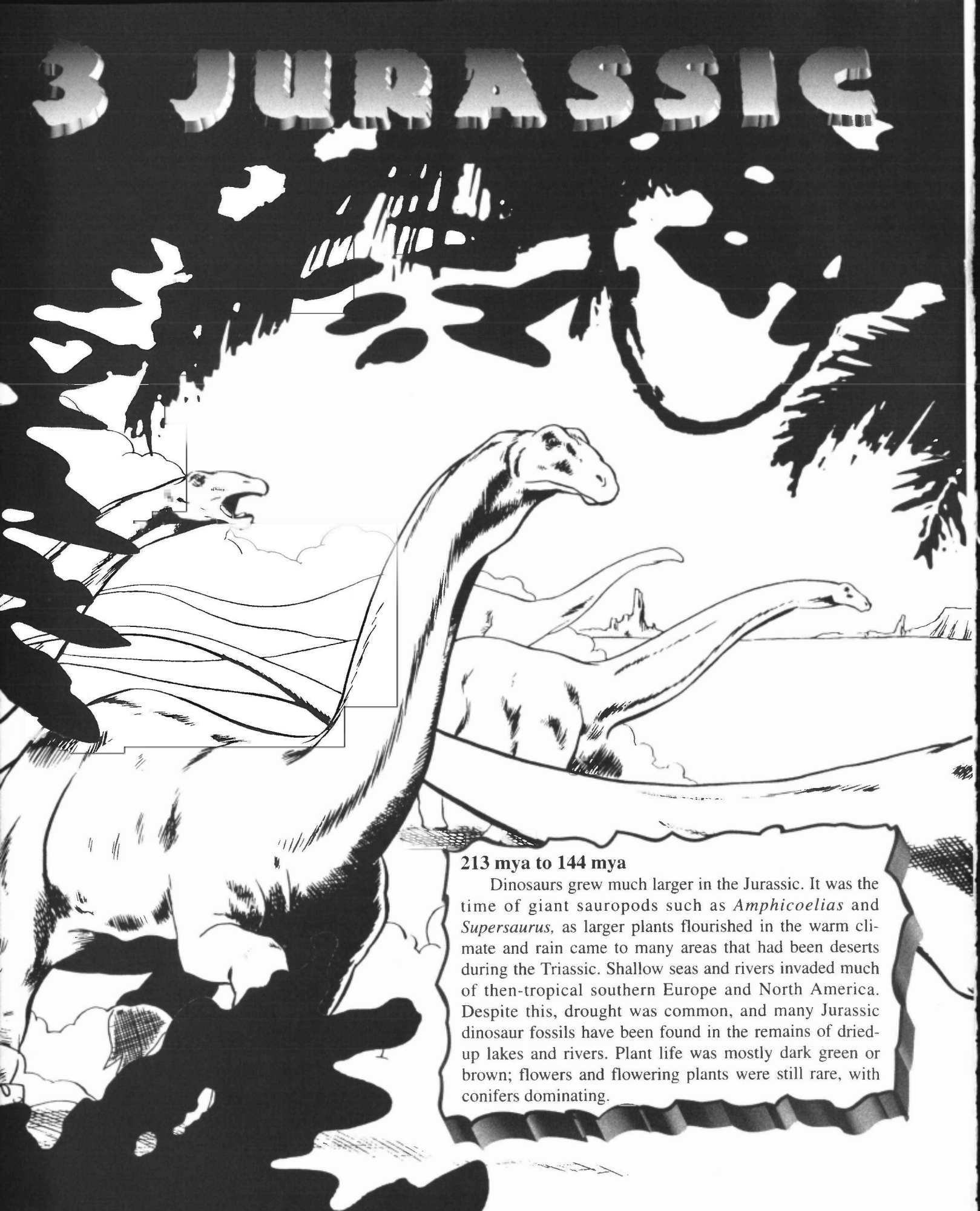
Pistosaurus is closely related to *Nothosaurus,* but looks more like a plesiosaur, having long oar-like flippers. Use *Nothosaurus* statistics, with Speed 9 in the water; if it ever ventures onto land, its Speed is ½ *hex* per turn.

Shonisaurus

ST: 50-70 **Speed/Dodge:** 9/6 **Size:** 30-40+
DX: 9 **PD/DR:** 1/1 **Wt:** 20-40 tons
IQ: 3 **Damage:** 3d+2 cut
HT: 12/55-65 **Reach:** C **Habitat:** SW
Time: Late Triassic (225-213 mya)
Range: America

Shonisaurus is the largest known ichthyosaur, being nearly 50' long and barrel-chested. Its jaws are long and narrow, with teeth only at the end of its snout. It kills its prey by biting it with the toothed end of its snout, doing 3d+2 cutting damage, holding it until it stops struggling, and finally swallowing it whole. Most human swimmers would be small enough to be eaten in this way.

3 JURASSIC



213 mya to 144 mya

Dinosaurs grew much larger in the Jurassic. It was the time of giant sauropods such as *Amphicoelias* and *Supersaurus,* as larger plants flourished in the warm climate and rain came to many areas that had been deserts during the Triassic. Shallow seas and rivers invaded much of then-tropical southern Europe and North America. Despite this, drought was common, and many Jurassic dinosaur fossils have been found in the remains of dried-up lakes and rivers. Plant life was mostly dark green or brown; flowers and flowering plants were still rare, with conifers dominating.

The Jurassic was geologically calm. Most of the earth's land area was still connected in the single supercontinent Pangaea. Large central areas, far from the ocean, were desert. Earthquakes and eruptions were far less of a problem than in the Triassic. Most of the land was flat; herbivorous dinosaurs could migrate great distances in search of food.

The level of the oceans rose, and sea creatures grew in both size and numbers – including ammonites, squid, bony fish, ichthyosaurs and plesiosaurs. Dinosaurs, large and small, dominated the land. Mammals remained small, burrowing or climbing trees to avoid the small theropods, and only venturing out at night. Pterosaurs grew in size and variety, the first birds appeared, and insects – some of them obscenely large – continued to thrive.

Oxygen content of the air during the Jurassic may have been as high as 30%. This will make visitors Overconfident, with IQ rolls at -1; it will also increase the risk of fire and corrosion. An even higher concentration may also dry out their eyes; roll HT+2 every minute, with every failure reducing Vision by 1. Time travelers from a world with experience of space travel (late TL7+) can protect against this by wearing reducing respirators with goggles. GMs should ignore this if it interferes with play.

The Name Game

Most dinosaurs are known by their genus name; *Tyrannosaurus rex* is one of only two animals commonly known by its binomial nomenclature (i.e., genus and species name; the other is the *Boa constrictor*). This is rarely a problem, as most dinosaur genera contain only one known species. Species names should be in Greek or Latin. Some species names are understandable in English (e.g., *Shantungosaurus giganteus*). Others commemorate places (usually where the dinosaur was found), and many honor people. If you want to name a species after a male person, use Latin grammar: just add an *-i* to his name (e.g., *garylarsoni*); for a female, add *-ae*, and for a family or couple, *-orum*.

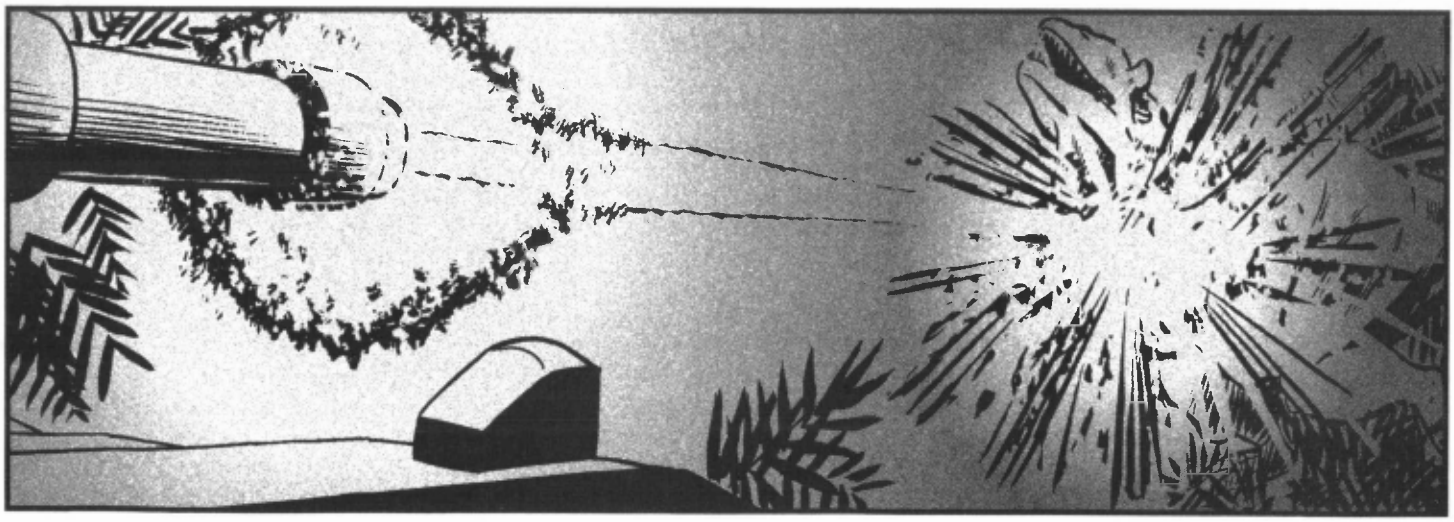
Five-syllable names are fine for extinct animals, but not ones that are encountered daily or avoided whenever possible. In any world where humans and dinosaurs mingle, there will be very short names for dinosaurs that can be yelled as a warning, e.g., "Rex," "Tops," etc. The staff in *Jurassic Park* used abbreviations such as "compys," "raptors" and "stegos"; Robert Sawyer's Quintaglio referred to "meatbeasts" and "blackdeaths," as well as using literal translations such as "wingfinger" and "hornface."

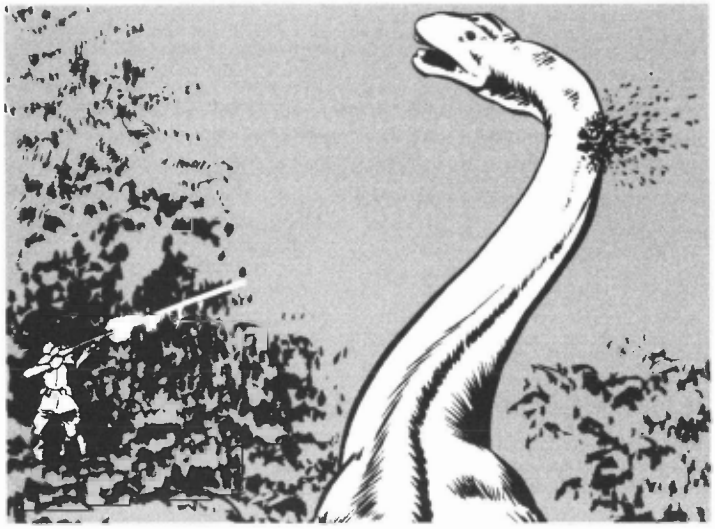
Some well-known dinosaur names are now considered invalid. The best-known of these is *Brontosaurus:* it is now considered the same genus as *Apatosaurus* – and, as the name *Apatosaurus* is older, that was the name that was kept (*Brontosaurus* still has its defenders, including Steven Jay Gould and Robert Bakker, and is still widely used unofficially). The teeth for which *Trachodon* was named have been identified as belonging to two completely different dinosaurs – one a hadrosaur, the other a ceratopsian. Some dinosaur fossils were later proven not to be dinosaurs at all: some are birds or crocodiles, and an *Aachenosaurus* bone turned out to be petrified wood.

Invalid names	***Valid names***
Anatosaurus	*Edmontosaurus* and *Anatotitan*
Atlantosaurus	*Apatosaurus*
Brontosaurus	*Apatosaurus*
Dynamosaurus	*Tyrannosaurus*
Gorgosaurus	probably an *Albertosaurus*
"Jurassosaurus"	*Tianchisaurus*
Labrosaurus	*Allosaurus*
Laelaps	*Dryptosaurus*
Stenonychosaurus	*Troodon*
Uintasaurus	*Camarasaurus*

DINOSAUR-KILLERS

Dinosaurs would be very dangerous to time travelers, mad scientists, or any other humans they encountered – biting, trampling, head-butting, and disemboweling with spiked tails or sickle claws. Many of the large theropods (or sharks, marine reptiles, or crocodilians) might easily bite a human in half: any bite to areas 9-11 that does damage of twice the victim's hit points or more will bisect him unless he makes a successful roll vs. HT, with one half (GM's choice) being swallowed. Similarly, a bite to a limb or head that does damage at least equal to the victim's hit points will sever it (roll vs. HT to avoid). This may work on some dinosaurs, but not all: full-grown sauropods have a lot of neck, but they also have a lot of hit points.





Killing dinosaurs, if necessary, is best done from a great distance with something that does at least 15d of damage in one hit – cannon, tank guns, TL9+ "Dinosaur Lasers," iridium asteroids, etc. At this level of damage, hit location and DR are unimportant, and only the large sauropods are likely to need a second shot to finish them off.

But hand weapons could suffice: assault rifles such as the AK-47 (already responsible for the near-extermination of elephants and rhinos in modern Africa), and ultra-tech equivalents such as military laser rifles. Such guns can reduce even the toughest *T. rex* to 0 HT in less than a second – or, if they hit the legs rather than the head or torso, cripple it until it bleeds to death (hardly sportsmanlike, but preferable to becoming dinosaur chow). Hit location is an issue only if the GM wants it to be – for example, if the PCs are so low on ammunition that every shot has to count.

If the PCs are using weapons with less penetration – SMGs, shotguns, Gauss needlers, pistols, and most melee weapons – the dinosaurs' natural DR becomes a factor. Some dinosaurs, including many titanosaurs and ankylosaurs, had scutes (armor plates) over part of their hide, giving extra DR to random hits.

Parts of the Body

Brain: even the largest dinosaurs had relatively small brains, often protected with heavy skulls. Hit penalty is -8 for theropods, -9 for herbivores and small dinosaurs (man-sized or less). Locating the brain in some large skulls (especially those of pachycephalosaurs) may require a Zoology roll.

Head: this can be hit on a -7 for small dinosaurs or the ostrich-like Ornithomimidae; -5 for sauropods, stegosaurs, or man-sized dinosaurs; and -4 to -1 for theropods, ceratopsians, hadrosaurs, etc. No special damage results, but critical hits go to the Critical Head Blow table (p. B202). This may be the easiest part to hit, if adventurers wind up in melee with dinosaurs.

Eyes: some dinosaur eyes were quite large. -6 to -9 to hit; impaling and missile attacks go straight through to the brain.

Neck: Crushing attacks to the neck do 1.5× damage; cutting and impaling attacks both do double damage. The victim is stunned if he takes total hits over 1/3 HT to the neck. If the neck takes over HT/3 damage from an edged weapon, a HT roll is necessary to avoid decapitation!

Sauropods had huge, snake-like necks (+1 to +4, depending on size), while the solid-bodied, armored ceratopsians and ankylosaurs were effectively neckless. Long necks are vulnerable; if they take 1/3 of hit point damage from an edged weapon, a HT roll is needed to avoid decapitation. The neck is targeted at -2 for most bipeds (including the small but long-necked ornithomimids), down to -5 for those smaller than human.

Forelimb (biped): will be crippled by a blow doing more than half HT (for a theropod or small dinosaur), or half hit points (for hadrosaurs and other herbivores that can walk on two legs or all fours). -1 to -3 to hit, depending on size.

Leg: will be crippled by a blow doing more than half hit points. A quadruped can still run with one crippled leg if it rolls DX-3; Speed is reduced by 3. -2 to hit for a man-sized dinosaur, up to +1 for theropods and sauropods. Legs and tail may be the only targets for humans in melee with large dinosaurs; the head and body may be out of reach. Legs are rarely well armored.

Foot: will be crippled by a blow doing more than one third of hit points. -1 to -4 to hit the birdlike feet of the bipeds, depending on size; -1 for the tree-trunk feet of large quadrupeds.

Random Hit Locations

Large Biped (theropods, hadrosaurs, iguanodonts, boneheads, etc.): roll 3d

3	Brain
4-5	Head
6	Tail
7	Forelimb (roll for left or right)*
8-11	Body
12-14	Hind Leg (roll for left or right)
15-16	Foot (roll for left or right)
17+	Neck

* If attacking from behind or above (unsportsmanlike but sensible), treat all forelimb hits as tail hits.

Sauropods and Plesiosaurs: roll 2d

2	Head
3-5	Foreleg (roll for left or right)
6	Neck
7-9	Body
10-11	Hind Leg (roll for left or right)
12	Tail

Ceratopsians: roll 2d*

2-4	Foreleg (roll for left or right)
5-7	Frill
8-9	Body
10-12	Hind Leg (roll for left or right)

* This assumes that the target is facing the attacker. Side-on or from the rear, the frill is hit on a 5, the body on a 6-9.

Other quadrupeds (stegosaurs, ankylosaurs, hadrosaurs on all fours, etc.): roll 2d

2-3	Head
4-6	Foreleg (roll for left or right)
7-9	Body
10-11	Hind Leg (roll for left or right)
12	Tail

Pterosaurs

The ratio of wingspan to body increased as the size of the pterosaur increased. To determine random hits on a flying pterosaur, roll 1d and add half the pterosaur's size. On a 1-3, the head is hit; on a 4-5, the body; on anything higher, the wings. Any attack to the wing doing more than half the pterosaur's total hit points will break the wing, making flight impossible.

1-2	Head
3-4	Body
5-6	Wings

Combat Example: Brad and Janet are trying to steal some half-gallon *Hypselosaurus* eggs, when the *Hypselosaurus* unexpectedly returns. Too heavily encumbered to outrun it, they decide to attack. Brad has a Remington 870 and a machete, Janet an M-1 carbine loaded with hollow-points. Brad fires twice, both shots hitting its left front leg. The leg has DR 1, taking one point off each die of damage the shotgun does; Brad rolls 4d-4 twice, for a total of 16 points. The dinosaur has 32 hit points; it'll take half of that to cripple its leg, which is exactly what Brad has done. It reduces the dinosaur's speed by 3, down to 2, but the GM rolls the dinosaur's DX-3, successfully, so the *Hypselosaurus* keeps its footing; it would need to take half its ST (40/2 = 20) to knock it back one hex, so neither blast is enough to stop it cold.

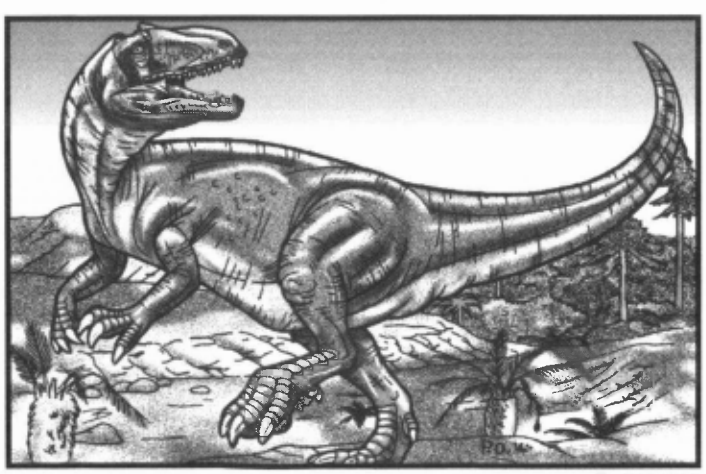
Janet fires three rounds from her M-1, hitting it twice in the body and once in the neck. The dinosaur's body has DR 1d-2, minimum 1; the GM rolls a die for each hit, getting a 2 and a 6, so the first bullet hits nothing but hide (DR 1), while the second hits a bony plate (DR 4). The shots do 10 and 6 points of damage respectively; being hollow-points, that's 5 and 3 against DR of 1 and 4. The second shot bounces off, the first penetrates and expands to do 8 points of damage. The third hits its neck (DR 1), doing 12 points; 5 points gets through the DR, and ×2 makes 10. Basic crushing damage to the throat is multiplied by 1.5, for a total of 15. This is more than a third of its hit points, so it's stunned; it's also down to 1 hit point, so its Move is halved. Brad and Janet can now outrun it easily. The *Hypselosaurus* will take more than three hours to bleed to death, unless a predator hears or smells it and finishes it off.

Predators

Allosaurus

ST: 75-100 **Speed/Dodge:** 11/7 **Size:** 12+
DX: 14 **PD/DR:** 2/2 **Wt:** 1-5 tons
IQ: 3 **Damage:** 4d imp#
HT: 14/40-50 **Reach:** C, 1 **Habitats:** P, F
Time: Late Jurassic – Early Cretaceous (156-110 mya)
Range: N. America, Australia **Discovered:** 1877

Allosaurus is the most common and best known of the Jurassic carnivores. Smaller and only slightly less notorious than *Tyrannosaurus rex*, it measures 30' to 40' long, and stands 15 feet tall. Its head alone is 3' long, and its serrated teeth 3" long (doing 4d impaling damage). Its jaw is hinged in front, enabling it to swallow lumps of meat larger than its own head (including, possibly, time travelers). It has small horns above each eye, which may have been used in non-lethal head-butting matches with others of its kind.



Allosaurus

Allosaurus' forelimbs are relatively small, but they end with three ten-inch claws that are useful for holding onto large prey. These claws do 1d cutting damage, with a 2-hex reach. Its hind legs are powerfully muscled, and may have been used to pin down smaller or weakened prey (Contest of ST).

Allosaurus preys on the gigantic sauropods, such as *Apatosaurus* and *Camarasaurus*, with which it shares the Jurassic floodplains. Allosaurus might follow sauropod herds, picking off calves that strayed and waiting for adults to die of natural causes, or it might hunt in packs, panicking the sauropod herds into splitting and then taking the slowest. It is not above scaring smaller theropods such as *Ceratosaurus* from their prey.

Ceratosaurus

ST: 50-65 **Speed/Dodge:** 10/7 **Size:** 9+
DX: 14 **PD/DR:** 2/2 **Wt:** 1-1½ tons
IQ: 3 **Damage:** 3d-1 imp#
HT: 13/32-40 **Reach:** C, 1 **Habitats:** P, F
Time: Late Jurassic (156-145 mya)
Range: Africa, N. America **Discovered:** 1884

Ceratosaurus is a 20' long theropod with a thin ten-foot tail, four-fingered forelimbs, small horns above its eyes, and a prominent horn on its nose. It stands up to 15' tall. Its eyes are large, but set for peripheral vision rather than looking straight ahead; *Ceratosaurus* may need to spend more time on the alert for larger predators than it does hunting for prey. Make Vision and Smell rolls at 14, Hearing at 12.

Ceratosaurus' skull is too thin for it to have engaged in much head-butting; its horns may be used by hatchlings trying to break out of their eggs, or as a sexual display. *Ceratosaurus* bites in close combat for 3d-1 impaling damage, or claws at 1-hex reach for 1d-1 cutting damage.

Compsognathus

ST: 3-5 **Speed/Dodge:** 9/7 **Size:** 1
DX: 14 **PD/DR:** 0/0 **Wt:** 6-13 lbs.
IQ: 3 **Damage:** 1d-3 cut
HT: 14/6-8 **Reach:** C **Habitats:** P, F
Time: Late Jurassic (156-145 mya)
Range: Europe **Discovered:** 1861

Compsognathus ("elegant jaw") is one of the smallest known dinosaurs. It grows to barely 40" long and 1' high, with a 2½" skull, powerful hind legs, and tiny forelimbs. It eats small lizards (and, no doubt, large insects, small mammals, and carrion) and is unlikely to attack a conscious adult human unless either human or compy is very badly wounded.

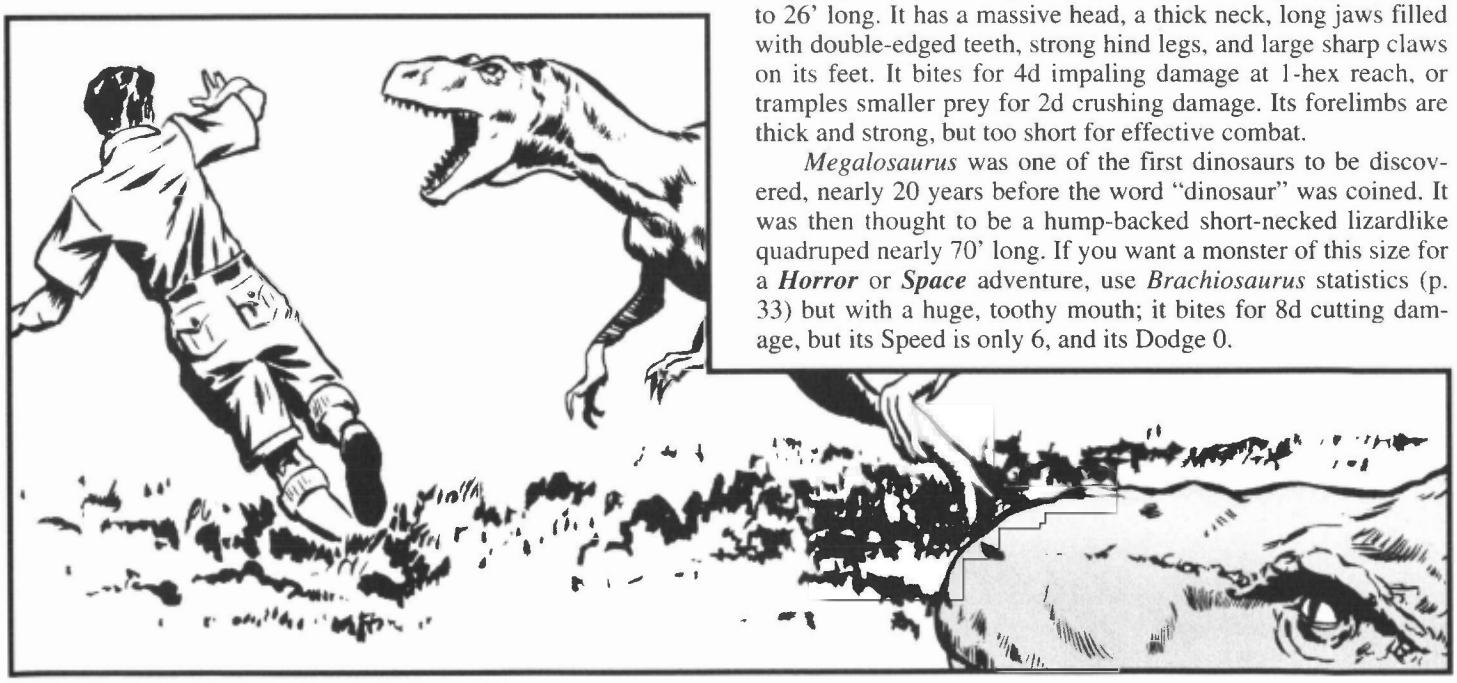
In a "lost realm" where cats never evolved, *Compsognathus* might be domesticated as vermin-catchers.

Dilophosaurus

ST: 50-65 **Speed/Dodge:** 12/7 **Size:** 9+
DX: 14 **PD/DR:** 2/2 **Wt:** 1-2 tons
IQ: 3 **Damage:** 2d+2 imp#
HT: 14/40-50 **Reach:** C, 1# **Habitats:** P, F
Time: Early Jurassic (208-194 mya)
Range: Africa, N. America, Asia **Discovered:** 1954

Dilophosaurus ("two-crested lizard") is known only from the skeletons of some 20' long subadults, and some footprints. Adults may grow as large as *Allosaurus*; if so, use *Allosaurus* statistics with a bite doing 3d impaling damage. (They are much larger than the dwarf *Dilophosaurus* seen in *Jurassic Park*, and there is no evidence that *Dilophosaurus* can spit poison or fan their necks.)

Dilophosaurus' crested skull and long sharp teeth are too delicate for delivering a killing bite to large prey, but its forelimbs are longer and stronger than those of later theropods; it claws at 2-hex range for 3d cutting damage. It travels in packs, and might use pack tactics to run down herbivores, slashing at them and waiting until they collapse or bleed to death.



Eustreptospondylus

ST: 45-60 **Speed/Dodge:** 12/7 **Size:** 9+
DX: 14 **PD/DR:** 2/2 **Wt:** 1-2 tons
IQ: 3 **Damage:** 2d+1 imp
HT: 14/40-50 **Reach:** C, 1 **Habitats:** P, F
Time: Middle Jurassic (175-165 mya)
Range: Europe **Discovered:** 1841

Eustreptospondylus is a lightly-built European theropod which grows from 16' to 23' long. It is similar to *Allosaurus* in appearance and behavior, and may have been its ancestor.

Gasosaurus

ST: 25-30 **Speed/Dodge:** 9/6 **Size:** 4-6
DX: 12 **PD/DR:** 1/1 **Wt:** 700-1,000 lbs.
IQ: 3 **Damage:** 1d+2 cut
HT: 12/25-30 **Reach:** C, 1 **Habitat:** P
Time: Middle Jurassic (175-163 mya)
Range: Asia **Discovered:** 1985

The 12' long *Gasosaurus* ("gas lizard," discovered by employees of a gas company) is a mid-sized theropod. It preys on small herbivores, biting for 1d+2 cutting damage; anything human-sized would be ideal prey for it. It also eats carrion, including the remains of *Shunosaurus*.

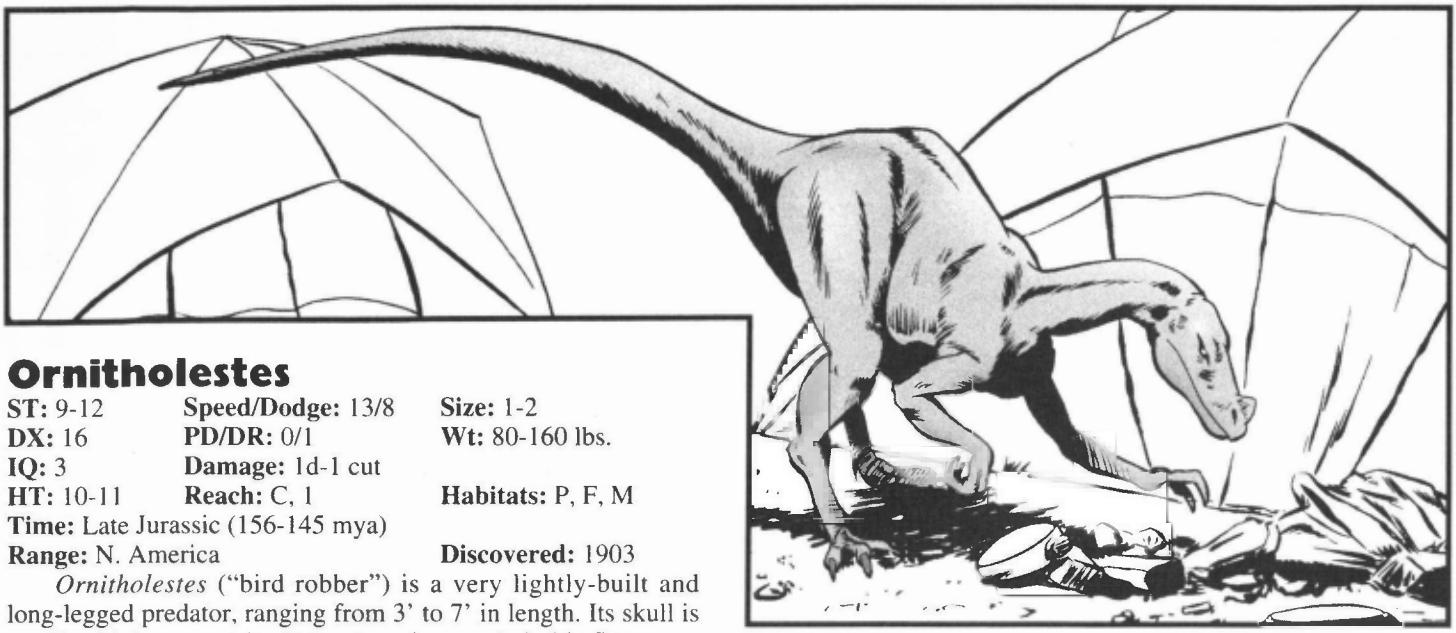
This is a particularly suitable predator for a "lost realm" adventure. Small species often thrive (or evolve) on islands where there isn't enough food for a breeding population of full-sized individuals (see *Dwarf Elephant*, p. 79).

Megalosaurus

ST: 60-80 **Speed/Dodge:** 9/7 **Size:** 12+
DX: 14 **PD/DR:** 2/2 **Wt:** 1-2½ tons
IQ: 3 **Damage:** 4d imp#
HT: 13/35-45 **Reach:** C, 1 **Habitats:** P, F
Time: Middle Jurassic (175-155 mya)
Range: Europe **Discovered:** 1824

Megalosaurus ("big lizard") is a large theropod, growing up to 26' long. It has a massive head, a thick neck, long jaws filled with double-edged teeth, strong hind legs, and large sharp claws on its feet. It bites for 4d impaling damage at 1-hex reach, or tramples smaller prey for 2d crushing damage. Its forelimbs are thick and strong, but too short for effective combat.

Megalosaurus was one of the first dinosaurs to be discovered, nearly 20 years before the word "dinosaur" was coined. It was then thought to be a hump-backed short-necked lizardlike quadruped nearly 70' long. If you want a monster of this size for a ***Horror*** or ***Space*** adventure, use *Brachiosaurus* statistics (p. 33) but with a huge, toothy mouth; it bites for 8d cutting damage, but its Speed is only 6, and its Dodge 0.



Ornitholestes

ST: 9-12 **Speed/Dodge:** 13/8 **Size:** 1-2
DX: 16 **PD/DR:** 0/1 **Wt:** 80-160 lbs.
IQ: 3 **Damage:** 1d-1 cut
HT: 10-11 **Reach:** C, 1 **Habitats:** P, F, M
Time: Late Jurassic (156-145 mya)
Range: N. America **Discovered:** 1903

Ornitholestes ("bird robber") is a very lightly-built and long-legged predator, ranging from 3' to 7' in length. Its skull is small, with large nostrils. It has three long and nimble fingers on each hand, and can claw and bite at 1-hex range for 1d-1 cutting damage.

Ornitholestes eats mostly small prey that it can grab with its hands and run away with – including the eggs and young of other dinosaurs – and carrion; its acute sense of smell (16) and fast running speed might enable it to reach a dead dinosaur ahead of larger scavengers such as *Allosaurus.*

Ornitholestes is unlikely to attack anything as large as a human, but it might steal small items from a time traveler's camp – especially if, like some modern birds, it likes taking small, bright articles to decorate a nest as part of its courtship behavior.

Sarcosaurus

Time: Early Jurassic (206-200 mya)
Range: Europe **Habitats:** P, F
Discovered: 1921

Sarcosaurus is an early ceratosaurid, roughly 12' long. Use *Gasosaurus* statistics.

Sinraptor

ST: 70-90 **Speed/Dodge:** 11/7 **Size:** 12+
DX: 14 **PD/DR:** 2/2 **Wt:** 1-3 tons
IQ: 3 **Damage:** 4d-1 imp
HT: 14/40-50 **Reach:** C, 1 **Habitats:** P, F, D
Time: Late Jurassic (163-145 mya)
Range: Asia **Discovered:** 1978

Sinraptor ("Chinese robber") is a heavily-built theropod, ranging from 22' to 33' long. Its forelimbs are too small to be useful in combat, but its skull is huge – 43" long and 27" high, with a small crest on its snout. Its bite does 4d-1 impaling damage at 1-hex reach. Its behavior is probably similar to that of *Allosaurus.*

Syntarsus

Time: Early Jurassic (208-194 mya)
Range: Africa, America **Habitats:** D, P, F
Discovered: 1969

Syntarsus is a lightly-built bipedal carnivorous dinosaur growing up to 10' long, very similar to *Coelophysis* (p. 22). Use *Coelophysis* statistics. It preys mostly on smaller vertebrates, but hunts in packs of about 30 and can bring down much larger herbivores.

Female *Syntarsus* are slightly more robust than males, and their packs may be matriarchies.

Teleosaurus

ST: 16-20 **Speed/Dodge:** 8/7# **Size:** 4
DX: 14 **PD/DR:** 3/4# **Wt:** 200-300 lbs.
IQ: 3 **Damage:** 1d cut#
HT: 14/14-18 **Reach:** C# **Habitat:** FW
Time: Early Jurassic (206-188 mya)
Range: Europe

Teleosaurus is a 10' long crocodile with a narrow snout, similar to the modern gavial but with shorter legs. It has Speed 1 on land, and sprints at 2. It has PD 3, DR 4 everywhere except its underbelly, which has PD1, DR 2. It bites for 1d cutting damage; its tail-whip has Reach 1, for 1d+1 crushing damage, and is intended to knock opponents to the ground so they can more easily be bitten. In other respects, treat it as a crocodile (p. 22).

Torvosaurus

Time: Late Jurassic (156-145 mya)
Range: N. America **Habitats:** P, F
Discovered: 1979

The 30' long *Torvosaurus* ("savage reptile") is a heavily built theropod with very short, powerful forelimbs, quite similar to *Megalosaurus.* Use *Megalosaurus* statistics.

Yangchuanosaurus

Discovered: 1978

Yangchuanosaurus is a 27' long sinraptorid. Use *Sinraptor* statistics.

Herbivores

Sauropods

A sauropod is the sort of dinosaur most people think of when they hear the word "dinosaur" – 30 to 50 yards of neck and tail and barrel-shaped body, thin at both ends and very thick in the middle, standing on four tree-trunk legs and weighing more than a family of elephants. Most sauropods are so large that they receive no Dodge roll, except for their heads, which Dodge at 4.

Sauropods are "high-browsing" herbivores, adapted to chomping the broad needles of tall conifers. They are not aggressive; some species have vestigial claws on their forelimbs, but these are of little use in combat, and their mouths seem too small to bite at large theropods. The sauropod's best defense is its sheer bulk and, in some species, a whiplike tail. Sauropods are unlikely to be a danger unless molested; a healthy and unencumbered human could probably outrun and out-dodge one, and adult sauropods probably wouldn't notice anything as small as a human.

They might, however, *trample* a tent or a stalled vehicle without knowing it was there (accidental tramples do half damage). If a person is stepped on by one of these giants, make a HT roll. On a *success*, he takes the listed damage. On a failure, he is simply crushed flat, and dies instantly.

To assess the damage done by a herd of stampeding sauropods, determine the number of animals in the herd, and divide by the number of hexes that their path is wide, to get the number of sauropods running through any particular hex. Stampeding brachiosaurs would be an excellent way to persuade a party that they're carrying too much gear . . .

The Speeds listed below are (as always) estimates, falling between the extremes suggested by different authorities. Robert Bakker has calculated that *Brachiosaurus* may have been capable of a top speed of 27 mph (Move 13), and *Apatosaurus* and *Diplodocus* of 18 mph (Move 9) – much faster than a running man. Dinosaur trackway specialist Tony Thulborn puts *Diplodocus'* top speed at 7.5 mph (Move 3), with *Brachiosaurus* and *Apatosaurus* lumbering along at 5 mph (Move 2). GMs should use whichever figure best suits their campaign.

Amphicoelias

ST: 500+ **Speed/Dodge:** 5/0 **Size:** 100+
DX: 8 **PD/DR:** 2/3 **Wt:** 110-166 tons
IQ: 3 **Damage:** 7d cr#
HT: 17/350-400 **Reach:** - **Habitats:** F, P
Time: Late Jurassic (156-144 mya)
Range: N. America **Discovered:** 1878

The little-known *Amphicoelias fragillimus* may be the largest animal to have walked on Earth – close to 170' long and weighing as much as 166 tons. It is a diplodocid with unusually long, slender legs, and a whiplike tail with a 25-hex reach. A slam with this tail would automatically hit anything above a given height, and anyone within the affected area would need to make a Dodge roll to avoid being hit for 7d crushing damage; assess knockback as from a slam. Fortunately, as *Amphicoelias* is about 30' high at the hip, these tail-whips would usually pass above human heads (GM's option). *Amphicoelias* could also trample for 8d crushing damage.

Unfortunately, the only known fossil of *Amphicoelias fragillimus* (a single partial vertebra) is missing and was never photographed. *Amphicoelias altus* is much smaller; use *Diplodocus* statistics (see p. 34).

Apatosaurus (Brontosaurus)

ST: 300+ **Speed/Dodge:** 5/0 **Size:** 30-40+
DX: 9 **PD/DR:** 2/3 **Wt:** 18-36 tons
IQ: 3 **Damage:** 4d cr
HT: 17/100 **Reach:** 1-8 **Habitats:** F, P
Time: Late Jurassic (156-145 mya)
Range: N. America **Discovered:** 1879

The *Brontosaurus* ("thunder lizard"), possibly the best-known dinosaur, is 70' or more long as an adult. Though there is no longer a genus *Brontosaurus* (the specimen from which it was named having been proved to belong to the genus *Apatosaurus*), the name is still in common use.

Apatosaurus is related to *Diplodocus,* but is more heavily built and has a thicker neck. It is able to rear itself up onto its massive hind legs, using its tail for support, and reach 50 feet up into the trees that it eats. It lives mostly in forests, not swamps,

and probably avoids large bodies of water: an *Apatosaurus* stuck in a swamp would have been an easy catch for an *Allosaurus* or other theropod. Like elephants, most *Apatosaurus* travel in small family groups or small herds, though males without harems or offspring travel alone.

Apatosaurus' primary defense is its sheer bulk, which enabled it to trample for 6d crushing damage. The last ten feet of its tail is reinforced with bony rods, and can be used to whip predators in rear hexes; the tail has a reach of 8 hexes and can swing 8 hexes per turn (movement is measured by the tip of the tail). The tail automatically hits anything more than 5' tall; anyone within the affected area must make a Dodge roll to avoid being hit for 4d crushing damage. Assess knockback as from a slam: fallen predators can then be trampled.

Barapasaurus

ST: 200+ **Speed/Dodge:** 5/0 **Size:** 27+
DX: 10 **PD/DR:** 2/3 **Wt:** 10-20 tons
IQ: 3 **Damage:** 3d cr
HT: 17/70 **Reach:** 1-6 **Habitats:** F, P
Time: Early Jurassic (208-188 mya)
Range: India **Discovered:** 1975

Barapasaurus is a 60-foot browser with relatively slender legs. Like *Camarasaurus,* its forelimbs and hind legs are approximately the same length.

Barapasaurus travel in large herds: partial remains of more than 300 have been found in India's Godavari Valley. Its mouth is too small and teeth too blunt to deliver an effective bite, but it can trample for 3d crushing damage.

Barosaurus

ST: 250+ **Speed/Dodge:** 5/0 **Size:** 37+
DX: 10 **PD/DR:** 2/3 **Wt:** 13-15 tons
IQ: 3 **Damage:** 4d cr
HT: 17/100 **Reach:** C# **Habitats:** F, P
Time: Late Jurassic (156-145 mya)
Range: Africa, N. America **Discovered:** 1890

The 90-foot-long *Barosaurus* is a close relative of *Diplodocus,* with a shorter tail, thicker hind legs, and an even longer neck. By rearing up on its hind legs and tail, it can reach more than 60' up into the trees (if only for brief periods). Like many sauropods, it has no defense apart from its size, and no attack apart from trampling for 4d crushing damage.

A spectacular cast of a *Barosaurus,* rearing up to protect its young from an *Allosaurus,* can be seen in the American Museum of Natural History in New York.

Brachiosaurus

ST: 400+ **Speed/Dodge:** 4/0 **Size:** 40+
DX: 9 **PD/DR:** 2/3 **Wt:** 40-65 tons
IQ: 3 **Damage:** 7d cr#
HT: 17/150-200 **Reach:** - **Habitats:** F, P
Time: Late Jurassic (156-145 mya)
Range: Africa, Europe, N. America **Discovered:** 1900

The massively-built *Brachiosaurus* is one of the biggest and best known of the sauropods, and the biggest land animal known from nearly complete remains. It grows up to 90' long, and stands 19' high at the shoulder. Its tail is short for a sauropod, and its forelimbs much longer than its hind limbs; it probably couldn't rear up onto its hind legs like an *Apatosaurus* to reach the tops of trees, but it doesn't need to.

Brachiosaurus has enormous nostrils on the top of its skull, which may serve as a sound amplifier ("nose flutes") or to enhance its sense of smell. They do not enable it to live underwater: the pressure would kill it. Like most sauropods, it lives near forests. It is probably solitary, relying on its sheer size as its only form of defense. It tramples for 7d crushing damage – enough to destroy the foot or tail of any theropod.

Magnificent specimens of *Brachiosaurus* may be seen at the Field Museum in Chicago and the Humboldt Museum in Berlin.

Camarasaurus

ST: 250+ **Speed/Dodge:** 5/0 **Size:** 25+
DX: 9 **PD/DR:** 2/2 **Wt:** 15-2o tons
IQ: 3 **Damage:** 4d cr
HT: 17/70 **Reach:** 1-6 **Habitats:** F, P
Time: Late Jurassic (156-145 mya)
Range: Europe, N. America **Discovered:** 1877

Camarasaurus is a 60-foot-long sauropod with a shorter, thicker neck and tail than most of its family. Its hind legs and forelimbs are approximately the same length, and it can't rear itself up onto its hind legs to reach the tops of trees. *Camarasaurus* is very abundant in North America during the late Jurassic; its remains are the most common dinosaur fossils.

Cetiosaurus

ST: 200+ **Speed/Dodge:** 5/0 **Size:** 33+
DX: 9 **PD/DR:** 2/2 **Wt:** 15-20 tons
IQ: 3 **Damage:** 4d cr
HT: 17/70 **Reach:** - **Habitat:** P#
Time: Middle Jurassic (181-169 mya)
Range: Africa, Europe **Discovered:** 1842

Cetiosaurus ("whale lizard"), the first of the sauropods to be discovered, grows to at least 50' long. Like *Brachiosaurus,* it has a relatively short tail, and forelimbs that are longer than its hind legs. Unlike most sauropods, it lives near lakes and beaches. It tramples for 4d crushing damage.

Dicraeosaurus

ST: 180+ **Speed/Dodge:** 5/0 **Size:** 20+
DX: 9 **PD/DR:** 2/2 **Wt:** 8-11 tons
IQ: 3 **Damage:** 2d+2 cr*
HT: 16/60 **Reach:** 1-5 **Habitats:** P, F
Time: Late Jurassic (181-169 mya)
Range: Africa **Discovered:** 1914

Dicraeosaurus is a 40' to 45' long diplodocid with a relatively short neck, hind legs nearly twice as long as the front legs, and a ridge of tall spines along the neck and back down as far as the hips. These spines could have discouraged predators from attacking the otherwise vulnerable neck; *Dicraeosaurus* may also be able to swing its neck and slash large opponents with its spines for 2d cutting damage. Its tail-whip (without spikes) does 2d+2 crushing damage with a five-hex reach; it can also trample for 3d crushing damage. It probably wasn't large enough to use the special trampling rules (see p. 32).

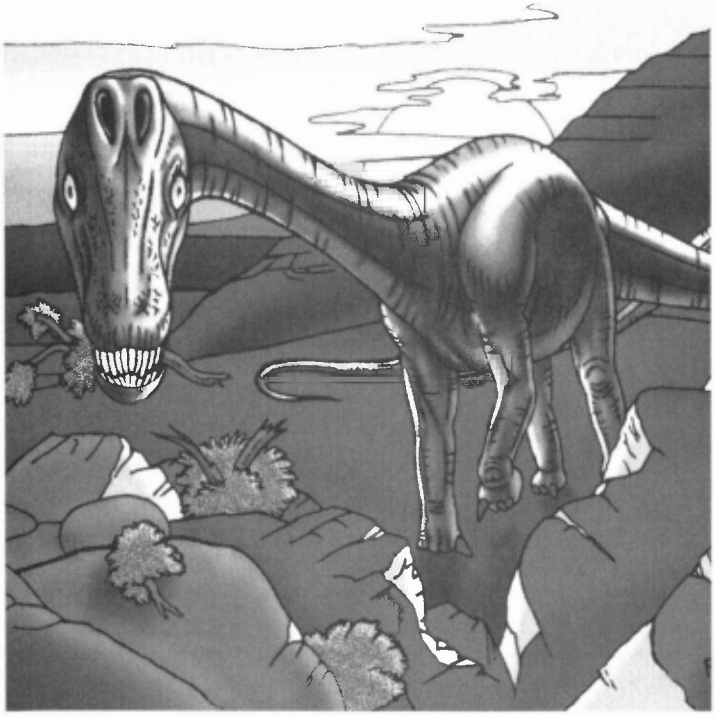
Diplodocus

ST: 250+ **Speed/Dodge:** 6/0 **Size:** 38+
DX: 11 **PD/DR:** 2/3 **Wt:** 10-12 tons
IQ: 3 **Damage:** 3d cr#
HT: 17/100 **Reach:** 1-12# **Habitats:** F, P
Time: Late Jurassic (156-145 mya)
Range: N. America **Discovered:** 1877

Diplodocus is one of the longest dinosaurs, but it is much more lightly built than most sauropods. Nearly half of its 90' length comes from its whiplike tail, which has a 12-hex reach and can swing 12 hexes per turn (movement is measured by the tip of the tail). The tail automatically hits anything more than 5' tall; anyone within the affected area must make a Dodge roll to avoid being hit for 3d crushing damage. Assess knockback as from a slam. *Diplodocus* can also trample for 4d crushing damage. It has strong jaws but only a few teeth, and doesn't bite in self-defense.

By rearing up onto its hind legs and anchoring itself with its tail, *Diplodocus* can reach 50' into the treetops to eat new branches; it also browses on the ground for ferns.

Diplodocus has nostrils just above its eyes, just as whales and elephants do. This is partly responsible for the idea that the sauropods lived under water (which is extremely unlikely); it has also been suggested that *Diplodocus* had a trunk like that of an elephant – or at least a short proboscis, like that of a tapir. GMs who want a 90' long sauropod that can pick pockets, please note.



Diplodocus

Mamenchisaurus

ST: 250+ **Speed/Dodge:** 6/0 **Size:** 38+
DX: 11 **PD/DR:** 2/3 **Wt:** 10-12 tons
IQ: 3 **Damage:** 3d cr#
HT: 17/100 **Reach:** 1-10# **Habitats:** F, P
Time: Late Jurassic (156-145 mya)
Range: Asia **Discovered:** 1957

Mamenchisaurus is a 80' to 90' long sauropod with a 35' neck – the longest of any animal known. Its tail is short and rather flat, like that of a *Camarasaurus*, and may carry a spiked club like that of *Shunosaurus*. It tramples for 3d crushing damage.

Rhoetosaurus

Time: Early Jurassic (181-175 mya)
Range: Australia **Habitats:** F, P
Discovered: 1926

Rhoetosaurus is a heavily built Australian sauropod, 40' to 50' long. Use *Cetiosaurus* statistics.

Seismosaurus

ST: 300+ **Speed/Dodge:** 5/0 **Size:** 70+
DX: 10 **PD/DR:** 2/3 **Wt:** 30-50 tons
IQ: 3 **Damage:** 4d cr#
HT: 17/150-200 **Reach:** - **Habitats:** F, P
Time: Late Jurassic to Early Cretaceous (156-125 mya)
Range: N. America **Discovered:** 1979

Seismosaurus ("earthquake lizard") is one of the longest dinosaurs known – its discoverer estimates its length at over 150 feet, though other scientists think that a "mere" 100 feet is more reasonable. As with *Diplodocus* (to which it seems closely related), nearly all of this length is neck and whiplash tail; its body is relatively small. Its legs are short, helping to stabilize it, and it has become known as the dachshund of dinosaurs. Its tail has a 15-hex reach, and can strike anything that dares attack it for 4d crushing damage; it can also trample for 5d crushing damage.

Shunosaurus

ST: 180+ **Speed/Dodge:** 5/0 **Size:** 20+
DX: 9 **PD/DR:** 2/2 **Wt:** 5-10 tons
IQ: 3 **Damage:** 3d+1 cr#
HT: 16/60 **Reach:** 1-5 **Habitats:** P, F
Time: Middle Jurassic (181-169 mya)
Range: Africa **Discovered:** 1979

Shunosaurus is a 33' long sauropod with a heavy club, like that of an *Ankylosaurus*, at the end of its long tail. This tail-whip normally does 3d+1 crushing damage with a five-hex reach. The club also has two small spines; on a critical hit, it does 3d+1 cutting damage, as well as any other critical hit effects.

Shunosaurus can also trample, for 3d crushing damage. Only the larger specimens would be massive enough to use the special trampling rules (see p. 32).

Supersaurus

ST: 400+ **Speed/Dodge:** 4/0 **Size:** 40+
DX: 9 **PD/DR:** 2/3 **Wt:** 40-50 tons
IQ: 3 **Damage:** 7d+2 cr#
HT: 17/200-250 **Reach:** - **Habitats:** F, P
Time: Late Jurassic (156-145 mya)
Range: N. America **Discovered:** 1973

Supersaurus is an enormous diplodocid, perhaps 120 feet long. It stands 27' high at the shoulder, and can reach up to 54' high to eat the tender shoots at the tops of trees; its largest vertebrae is 4½' high. Its tail-whip has a 12-hex reach, and does 4d crushing damage; it can also trample for 7d+2 crushing damage.

Volkheimeria

ST: 40-50 **Speed/Dodge:** 5/0 **Size:** 10-14
DX: 10 **PD/DR:** 1/1 **Wt:** 2-3 tons
IQ: 3 **Damage:** 2d cr
HT: 15/35-45 **Reach:** - **Habitats:** F, P
Time: Middle Jurassic (169-163 mya)
Range: S. America **Discovered:** 1979

The 40' long *Volkheimeria* is a small, primitive brachiosaurid (these statistics may also be used for young brachiosaurs and ultrasaurs). It tramples for 2d crushing damage.

Vulcanodon

ST: 30-50 **Speed/Dodge:** 5/4 **Size:** 4-8
DX: 10 **PD/DR:** 1/1 **Wt:** 1,000-1,500 lbs.
IQ: 3 **Damage:** 2d-2 cr
HT: 14/20-30 **Reach:** 1-2 **Habitats:** F, P
Time: Early Jurassic (208-201 mya)
Range: Africa **Discovered:** 1900

The 20' long *Vulcanodon* may have been the earliest of the sauropods. Like *Brachiosaurus,* it has long forelimbs and high shoulders, but its tail is long and whip-like (2-hex reach, doing 2d-2 crushing). It tramples for 1d+1 crushing damage.

Vulcanodon statistics can also be used for juveniles of other sauropod species.

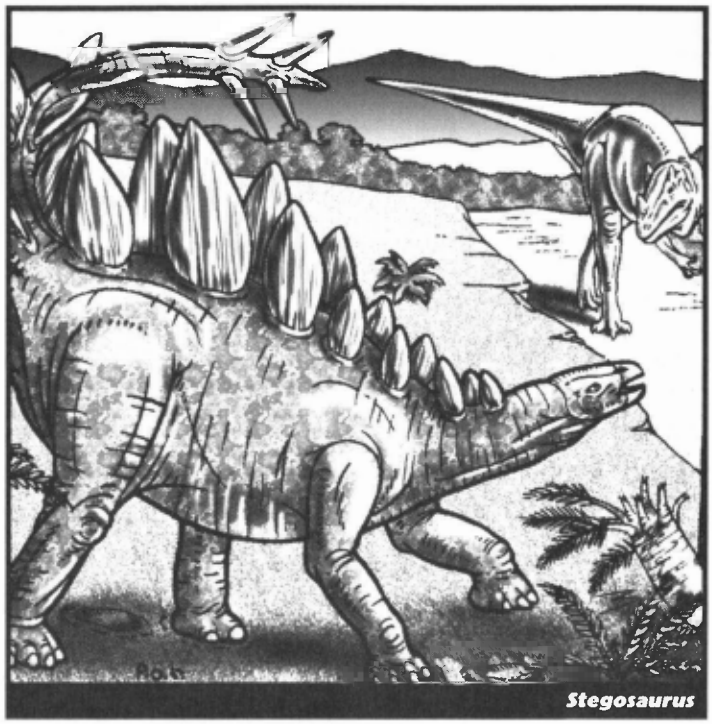
STEGOSAURS

Stegosaurus

ST: 50-75 **Speed/Dodge:** 4/4 **Size:** 12+
DX: 9 **PD/DR:** 2/4 **Wt:** 2-5 tons
IQ: 3 **Damage:** 4d imp#
HT: 15/50-65 **Reach:** 1, 2 **Habitats:** P, F, S
Time: Late Jurassic (156-145 mya)
Range: N. America **Discovered:** 1877

Stegosaurus is a herbivorous dinosaur with large rear legs, small front legs, a small head, a double row of plates along its back, and four long (up to 3'3") horizontal spikes at the end of its powerfully muscled tail. It grows up to 30' long; average length is about 20'. Standing on its hind legs to eat, it is 12' to 15' tall.

If attacked or threatened, *Stegosaurus* drops to all fours and lashes out with its tail. Its eyes are arranged for peripheral vision, and its flexible neck enables it to look back and strike large attackers with reasonable accuracy. On a roll of 9 or less


Stegosaurus

(modified for the opponent's size), two spikes hit for 4d impaling damage; on a 10-11, one spike hits for 2d. Anything in any back hex, or any hex adjacent to the back hexes, may be hit.

Stegosaurus is armored as well as armed; the plates on its back protect its spine, and small armor plates scattered along the body raise its DR to 4. The plates on its back also add two feet to its height, help to control its body temperature, and may also be used to attract mates.

Stegosaurus is notoriously small-brained for its size; its brain is smaller than a ping-pong ball and probably weighed less than three ounces. It was once thought to have enlarged nerve clusters near its tail, but these are more probably glycogen glands, storing energy for its tail and rear leg muscles.

Stegosaurus' snout is also very small for such a large creature, and toothless except for small cheek teeth. Like the sauropods, it eats almost constantly, and is peaceful unless actually attacked.

Dacentrurus

ST: 45-55 **Speed/Dodge:** 5/5 **Size:** 7-8
DX: 10 **PD/DR:** 2/4 **Wt:** 1-1½ tons
IQ: 3 **Damage:** 4d-4 imp#
HT: 15/40-50 **Reach:** 1, 2 **Habitats:** P, F, S
Time: Late Jurassic (163-150 mya)
Range: Europe **Discovered:** 1875

Dacentrurus, the first stegosaur to be described, grows up to 15' long. The plates on its back are smaller than those of *Stegosaurus,* and end at its hips. After that, it has a long row of paired tail spikes, from 14" to 18" long.

Against a human-sized target, *Dacentrurus* does a maximum of 4d-4 impaling damage, on a to-hit roll of 10 or less (same progression as *Stegosaurus*). Large predators such as *Megalosaurus* may receive the benefit of four or more pairs of spikes.

Huayangosaurus

ST: 40-50 **Speed/Dodge:** 8/5 **Size:** 5-6
DX: 11 **PD/DR:** 2/4 **Wt:** 1,600-2,000 lbs.
IQ: 3 **Damage:** 3d imp#
HT: 15/33-44 **Reach:** 1, 2 **Habitats:** P, F
Time: Middle Jurassic (170-160 mya)
Range: Asia **Discovered:** 1982

Huayangosaurus is 14' long, barely half the length of the better-known *Stegosaurus,* and stands about 6' high. Its back is protected by two rows of narrow, heart-shaped plates and spikes, and males also have small horns near their eyes. Six spikes adorn the end of its tail.

Huayangosaurus is the earliest known stegosaur, and its forelimbs are as long as its hind legs; it can run faster than *Stegosaurus,* but can't rear up on its hind legs. Like *Stegosaurus,* it can lash out with its spiked tail; on a roll of 11 or less (modified for the opponent's size), three spikes hit for 3d impaling damage; on a 12-13, 2 spikes for 2d; on a 14, one for 1d. Anything in any back hex, or hex adjacent to the back hexes, may be hit.

Kentrosaurus

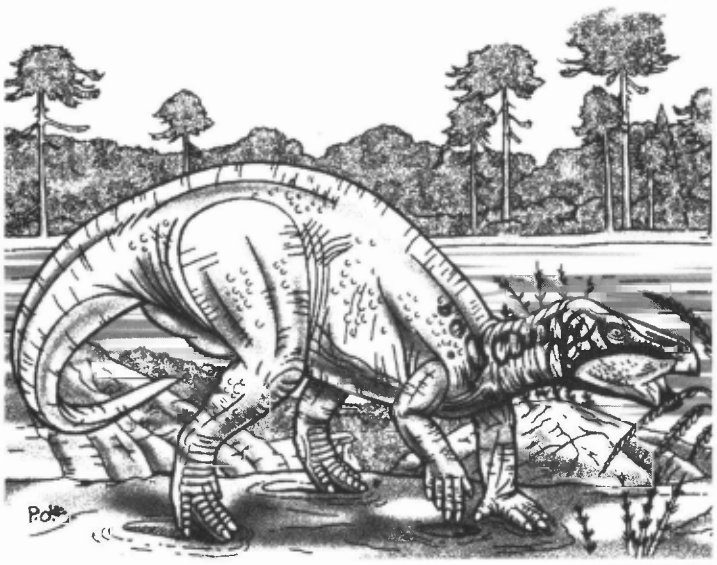
Time: Late Jurassic (156-150 mya)
Range: Africa **Habitats:** P, F, S
Discovered: 1915

Kentrosaurus is a 17' long stegosaur with small plates on its back, eight pairs of tail spines, and spikes protruding horizontally from its shoulders. Use *Dacentrurus* statistics. Large predators such as *Ceratosaurus* may be hit by three or even four pairs of spikes.

Lexovisaurus

Time: Middle to Late Jurassic (156-169 mya)
Range: Europe **Habitats:** P, F
Discovered: 1887

Lexovisaurus is a 17' long stegosaur, very similar to *Kentrosaurus* with tail spines up to 3'9" long, but with longer legs. Use *Dacentrurus* statistics, with Speed 7 (can sprint at 14 in short bursts).



Camptosaurus

Tuojiangosaurus

Time: Middle to Late Jurassic (163-150 mya)
Range: Asia **Habitats:** P, F
Discovered: 1977

Tuojiangosaurus is a typical 23' long stegosaurid. Use *Stegosaurus* statistics.

OTHER HERBIVORES

Anchisaurus

ST: 9-13 **Speed/Dodge:** 6/6 **Size:** 1-2
DX: 13 **PD/DR:** 0/1 **Wt:** 80-120 lbs.
IQ: 3 **Damage:** 1d-2 cut
HT: 10-11 **Reach:** C, 1 **Habitats:** P, F
Time: Early Jurassic (156-145 mya)
Range: N. America, Africa **Discovered:** 1868

Anchisaurus is a small prosauropod, 7' long including neck and tail. Its teeth are round and blunt, but its thumb has a large claw which inflicts 1d-2 cutting damage. It is primarily a quadruped, because of its large gut, but can rear up onto its hind legs briefly to forage or to defend itself.

Camptosaurus

ST: 30-40 **Speed/Dodge:** 11/7 **Size:** 16-20+
DX: 14 **PD/DR:** 1/1 **Wt:** 1-2 tons
IQ: 3 **Damage:** 1d+2 cr (trampling)
HT: 15/22-30 **Reach:** - **Habitats:** P, F
Time: Late Jurassic (156-145 mya)
Range: Europe, N. America **Discovered:** 1879

Camptosaurus ("flexible lizard") is a normally bipedal herbivore, growing up to 20' long and 3' to 4' high at the hips. It has short but strong forelimbs, enabling it to walk on all fours to browse on low-growing plants. It is very similar to the later *Iguanodon*, but lacks a spiky thumb, or any other form of attack apart from trampling for 1d+2 crushing damage. It is, however, much faster than most large Jurassic herbivores.

Of all Jurassic dinosaurs, *Camptosaurus* would be the most suitable for a riding animal: it is herbivorous, fairly fast, probably even-tempered, and has no spikes or ridges along its backbone. Given proper equipment, Riding (*Camptosaurus*) defaults to Riding (Horse or Camel) skill at -3.

Dryosaurus

ST: 11-13 **Speed/Dodge:** 12/7 **Size:** 2-3
DX: 15 **PD/DR:** 1/1 **Wt:** 80-150 lbs.
IQ: 3 **Damage:** 1d cr
HT: 13/12-14 **Reach:** C, 1# **Habitats:** P, F
Time: Late Jurassic (156-145 mya)
Range: Africa, N. America **Discovered:** 1878

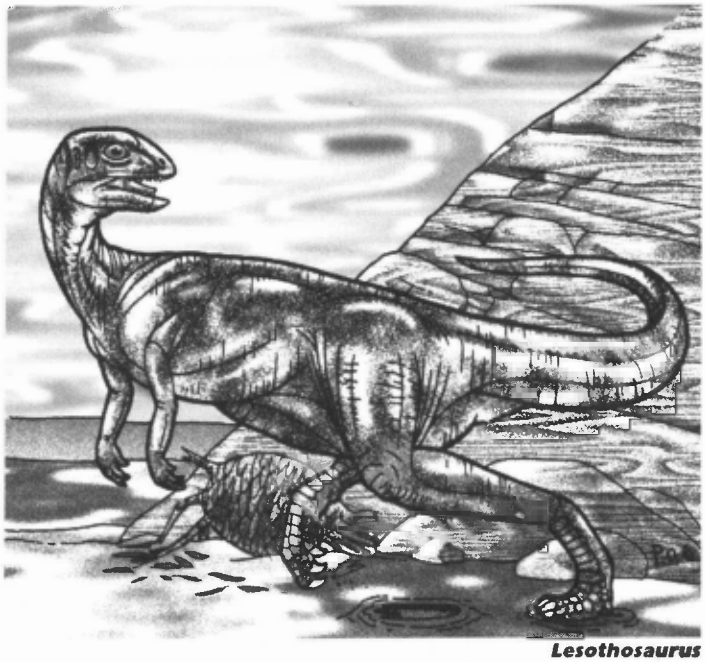
Dryosaurus is a lightly-built bipedal herbivore, 10' to 12' long, with hollow bones and small forelimbs. It has large eyes (Vision-15, Hearing-12, Smell-12), and teeth adapted for chewing tough plants. If threatened, it runs away; if cornered, it can bite for 1d crushing damage.

Heterodontosaurus **see p. 24**
Massospondylus **see p. 24**

Othnielia

ST: 6-9 **Speed/Dodge:** 11/7 **Size:** 1-2
DX: 14 **PD/DR:** 0/1 **Wt:** 30-60 lbs.
IQ: 3 **Damage:** -
HT: 7-10 **Reach:** - **Habitats:** P, F
Time: Late Jurassic (156-145 mya)
Range: N. America **Discovered:** 1877

Othnielia is a small hypsilophodont, growing up to 4½' long. It has no form of attack, but might make itself a nuisance by stealing items from time travelers' campsites.



Lesothosaurus

Lesothosaurus

ST: 3-5 **Speed/Dodge:** 11/7 **Size:** 1
DX: 14 **PD/DR:** 0/0 **Wt:** 15-20 lbs.
IQ: 3 **Damage:** 1d-4 imp#
HT: 14/6-8 **Reach:** C **Habitats:** P, F
Time: Early Jurassic (208-200 mya)
Range: Africa **Discovered:** 1978

Lesothosaurus is a 40" long bipedal omnivore, living mostly on plants but also eating insects and carrion. It has a partially opposable thumb, with a spike that does 1d-4 impaling damage; its toothed beak can also bite for 1d-3 crushing damage. If threatened, it runs. It has large eyes (Vision-14), and may have been nocturnal.

Tianchisaurus

ST: 30-40 **Speed/Dodge:** 5/0 **Size:** 10
DX: 11 **PD/DR:** 3/5 **Wt:** 1-2 tons
IQ: 3 **Damage:** 2d+1 cr
HT: 15/30-40 **Reach:** 1, 2 **Habitats:** P, F
Time: Middle Jurassic (170-160 mya)
Range: Asia **Discovered:** 1980

Tianchisaurus is the earliest known ankylosaur (see p. 51), and one of the smallest, measuring only 15' long, and standing about 3' high by 5' wide. It is heavily armored, with a clubbed tail that can be swung into any rear hex, or any hex adjacent to the rear hex, for 2d+1 crushing damage. It is too heavily constructed and short-legged to dodge; Dodge is 0.

Tianchisaurus nedegoapeferkimorum, unofficially known as "Jurassosaurus," is also the only dinosaur species named for the cast of a Hollywood movie (Neill, Dern, Goldblum, etc.)

Pterosaurs and Birds

Pterosaurs still dominated the air in the Jurassic, with the first birds appearing near the end of the period.

Archaeopteryx

ST: 1-3 **Speed/Dodge:** 10/6# **Size:** <1
DX: 12 **PD/DR:** 0/0 **Wt:** 1-3 lbs.
IQ: 3 **Damage:** 1d-5 cut
HT: 12/1-2 **Reach:** C **Habitats:** F, P
Time: Late Jurassic (156-145 mya)
Range: Europe **Discovered:** 1864

Archaeopteryx is the earliest known bird. It is 14 inches long, about the size of a modern pigeon, with a long bony tail. Its head is small, its jaws are lined with pointed teeth, and its wings are clawed, enabling it to climb trees.

Archaeopteryx can fly well in straight lines at top speed (Speed 10), but is poor at aerodynamics. Its legs are long, and it can probably run as fast as it can fly. It eats small mammals and reptiles; if threatened, it would probably fly or run away, but if cornered, it can bite for 1d-5 cutting damage.

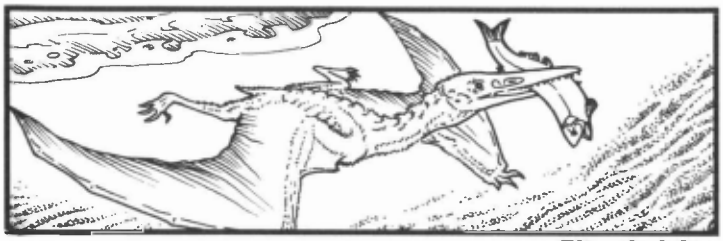
Dimorphodon

ST: 3-4 **Speed/Dodge:** 12/7# **Size:** 1-2
DX: 14 **PD/DR:** 0/0 **Wt:** 3-10 lbs.
IQ: 3 **Damage:** 1d-4 cut
HT: 14/2-3 **Reach:** C **Habitat:** #
Time: Early – Middle Jurassic (213-194 mya)
Range: Europe **Discovered:** 1858

Dimorphodon is a fish-eating pterosaur, 3' long with a 4' to 5' wingspan. Its legs are powerful and fairly long, suggesting that it can run fairly quickly on its hind legs (Speed 5, Dodge 7), with its wings and long tail counterbalancing its large head.

Pterodactylus

ST: 4-6 **Speed/Dodge:** 12/6# **Size:** 1-3
DX: 13 **PD/DR:** 0/0 **Wt:** 6-15 lbs.
IQ: 3 **Damage:** 1d-1 cut
HT: 14/4-6 **Reach:** C **Habitat:** #
Time: Middle – Late Jurassic (213-163 mya)
Range: Africa, America, Asia, Europe
Discovered: 1859



Pterodactylus

Pterodactyls are probably the best known pterosaurs. Species currently assigned to the genus *Pterodactylus* range from the seagull-sized *P. elegans* (6" long with a 10" wingspan) to the vulture-sized *P. grandii* (3' long with an 8' wingspan): the statistics above are for the largest specimens. All have long necks, short tails, long beaks and small teeth. *Pterodactylus* are fish-eaters and live near beaches, though smaller species and juveniles may also eat insects, and the largest might eat mammals and small reptiles or harry smaller fish-eaters out of their prey. On the ground, they crawl on all fours, rather like a bat; Move 2, Dodge 4.

Rhamphorhynchus

ST: 4-5 **Speed/Dodge:** 12/6 **Size:** 2
DX: 13 **PD/DR:** 0/0 **Wt:** 5-15 lbs.
IQ: 3 **Damage:** 1d-2 cut
HT: 14/4-5 **Reach:** C **Habitat:** #
Time: Middle to Late Jurassic (175-144 mya)
Range: Europe **Discovered:** 1832

Rhamphorhynchus is a long-tailed pterosaur with impressive-looking needle-like teeth, which interlock when the jaws are closed – excellent for holding squirming fish. Wingspans range from 16" to nearly 6': statistics above are for a large individual.

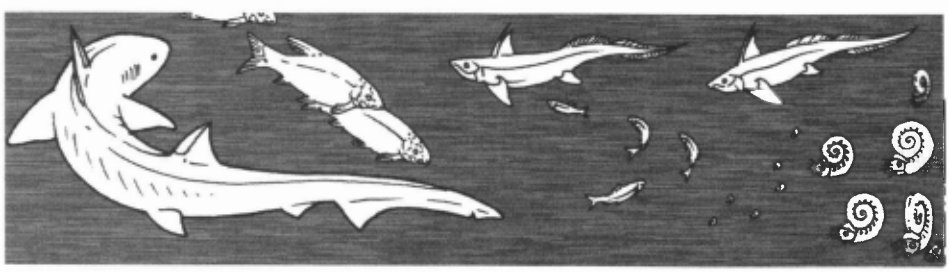
Sordes

ST: 3-4 **Speed/Dodge:** 12/7 **Size:** 1-2
DX: 14 **PD/DR:** 0/0 **Wt:** 3-8 lbs.
IQ: 3 **Damage:** 1d-4 cr
HT: 14/2-3 **Reach:** C **Habitats:** F, J, S
Time: Early to Middle Jurassic (213-194 mya)
Range: Asia **Discovered:** 1971

Sordes pilosus ("hairy devil") is a short-beaked long-tailed pterosaur, similar in appearance to *Rhamphorhynchus,* with a 2' wingspan. (Scientists are still debating the evidence that led the discoverer to conclude that it was hairy, but it's a reasonable assumption; small fliers would need some insulation to avoid losing body heat.) Its teeth are few and short, and its eyes large. It eats large insects and small reptiles, and may be a dusk feeder, occupying the niche now filled by bats or owls. If so, *Sordes* might be as gregarious as bats, with dozens living in a cave or tree. A "swarm" would be about a dozen *Sordes*, with a move of 8. It would do 1d of biting damage per turn; armor protects with its normal DR. It takes 8 hits to disperse a swarm of *Sordes*: see p. B143.

The Jurassic Oceans

Ocean levels rose during the Jurassic, and fish became more plentiful and diverse. Sharks, and other predatory fish, grew up to 30' long. Ammonites, squid and bony fish became more common, and marine reptiles – ichthyosaurs and plesiosaurs – evolved to feed on them.



Cryptocleidus

ST: 16-20 **Speed/Dodge:** 7/7# **Size:** 3-4
DX: 14 **PD/DR:** 1/1 **Wt:** 250-400 lbs.
IQ: 3 **Damage:** 1d+1 imp
HT: 14/10-20 **Reach:** C, 1 **Habitat:** SW
Time: Late Jurassic (163-145 mya)
Range: Europe **Discovered:** 1892

Cryptocleidus is a 13' long plesiosaur, an air-breathing marine reptile (not a dinosaur) with a long neck and large oar-like flippers. Its teeth are long, sharp and curved; they form a trap for catching small fish and shrimp, but also let it bite larger prey for 1d+1 impaling damage at up to 1-hex range.

Like most plesiosaurs, *Cryptocleidus* is built for maneuverability rather than speed. If it ever ventures onto land, which is unlikely (though it is possible that plesiosaurs, like modern sea turtles, came ashore to lay their eggs), its Speed would be ½ hex per *turn*.

Eurhinosaurus

ST: 16-20 **Speed/Dodge:** 11/6 **Size:** 2-3
DX: 12 **PD/DR:** 1/1 **Wt:** 100-250 lbs.
IQ: 3 **Damage:** 3d+3 imp#
HT: 11-14 **Reach:** C **Habitat:** SW
Time: Early Jurassic (210-180 mya)
Range: Europe

Eurhinosaurus is a 7' ichthyosaur with a snout like that of a modern sawfish. Its upper jaw is more than twice as long as its lower, and edged with sharp teeth. This saw is used for probing in sand or mud, and can also be an impressive weapon, slashing for 1d cutting damage. Given a 6-hex "running start," a *Eurhinosaurus* can do 3d+3 impaling damage – enough to hole a small boat.

Ichthyosaurus

ST: 16-20 **Speed/Dodge:** 11/6 **Size:** 2-3
DX: 12 **PD/DR:** 1/1 **Wt:** 100-400 lbs.
IQ: 3 **Damage:** 1d-1 cut
HT: 12-14 **Reach:** C **Habitat:** SW
Time: Early Jurassic – Early Cretaceous (210-115 mya)
Range: Europe **Discovered:** 1818

Ichthyosaurus ("fish lizard") is a streamlined, short-snouted marine reptile (not a dinosaur), 6' or 7' long – very similar to a modern dolphin, but with a vertical tail. It hunts small prey, mostly fish and squid; it has better senses than sharks (Vision-14, Hearing-14), and competes successfully with them. Riding (Ichthyosaur) defaults to Riding (Dolphin) at -3; they are far less intelligent and cooperative.

Hundreds of complete *Ichthyosaurus* skeletons have been discovered, including some killed at the moment of giving birth. Even their pigment cells have been fossilized, revealing that they are a dark reddish-brown color.

Liopleurodon

ST: 60-80 **Speed/Dodge:** 9/4 **Size:** 18-27
DX: 9 **PD/DR:** 2/2 **Wt:** 2-3 tons
IQ: 3 **Damage:** 4d+2 imp
HT: 15/40-70 **Reach:** C, 1 **Habitat:** SW
Time: Late Jurassic (163-145 mya)
Range: Europe **Discovered:** 1924

Liopleurodon is a pliosaur, a marine reptile descended from the plesiosaurs but with a much shorter neck, larger head, and better streamlining.

The 39' long *Liopleurodon* resembles a toothed whale with large flippers and a short tail, and chases its prey – mostly large squid and ammonites – into deeper waters than the surface-skimming plesiosaurs. It bites at close range for 4d+2 impaling damage.

Muraenosaurus

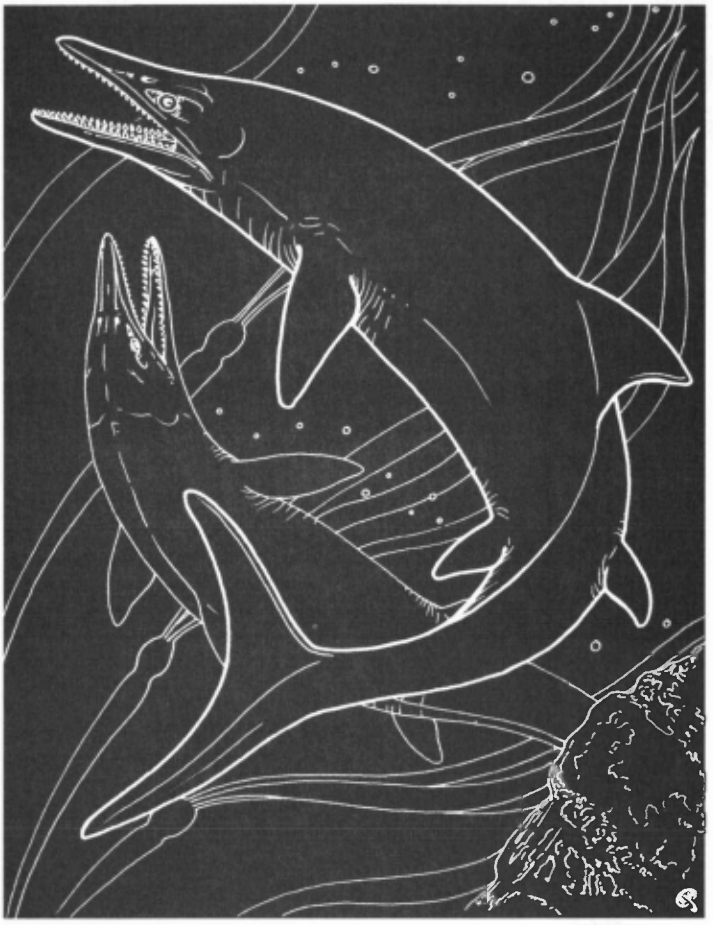
ST: 20-25 **Speed/Dodge:** 7/7# **Size:** 6-7
DX: 14 **PD/DR:** 1/1 **Wt:** 400-600 lbs.
IQ: 3 **Damage:** 1d imp
HT: 14/10-20 **Reach:** 1-3 **Habitat:** SW
Time: Late Jurassic (163-145 mya)
Range: Europe

Muraenosaurus is an early elasmosaur, a plesiosaur with an extremely long neck. Half of its 20' length is neck, though its head is only a foot long. *Muraenosaurus* bites at up to 3-hex reach, for 1d impaling damage.

Ophthalmosaurus

ST: 20-30 **Speed/Dodge:** 13/6 **Size:** 3-4
DX: 13 **PD/DR:** 1/1 **Wt:** 500-1,000 lbs.
IQ: 3 **Damage:** 1d cut
HT: 13/13-20 **Reach:** C **Habitat:** SW
Time: Late Jurassic (163-145 mya)
Range: America, Europe

Ophthalmosaurus is an ichthyosaur with superb streamlining and huge eyes – up to four inches across (Vision-16, Night Vision). It grows up to 12' long, and may be the fastest creature in the Jurassic seas. It is probably a night feeder, eating mostly squid and ammonites. It bites in close combat for 1d cutting damage.



Ichthyosaurs

Plesiosaurus

ST: 10-15 **Speed/Dodge:** 7/7 **Size:** 2-3
DX: 14 **PD/DR:** 1/1 **Wt:** 150-250 lbs.
IQ: 3 **Damage:** 1d-1 imp
HT: 14/10-15 **Reach:** C, 1 **Habitat:** SW
Time: Early Jurassic (210-180 mya)
Range: Europe **Discovered:** 1821

Plesiosaurus, one of the earliest plesiosaurs, is also one of the smallest: only 7' to 8' long including a very long neck. It bites at 1-hex range for 1d-1 impaling damage.

Temnodontosaurus

ST: 40-50 **Speed/Dodge:** 10/6 **Size:** 10-16
DX: 12 **PD/DR:** 1/1 **Wt:** 2-5 tons
IQ: 3 **Damage:** 2d-1 cut
HT: 12/35-45 **Reach:** C **Habitat:** SW
Time: Early Jurassic (210-180 mya)
Range: Europe

Temnodontosaurus is a 30' long ichthyosaur which cruises the coastal shallows hunting for large squid and ammonites. Its long, toothed beak bites for 2d-1 cutting damage in close combat.

4 CRETACEOUS

144 mya to 65 mya

The Cretaceous was the last and longest period of the Mesozoic. Land and sea temperatures rose during the first half of the period; there were tropical swamps in Africa, South America, India, Australia and Europe, coal swamps along the northern shore of Alaska, and hot deserts in Mongolia. Dinosaurs lived above the Arctic Circle and in the Antarctic, enduring the cold of the month-long nights.

The Cretaceous was much longer than the two preceding periods. As it began, Pangaea was separating into two smaller supercontinents: Laurasia (North America, Europe and Asia) and Gondwana (South America, Africa, India, Antarctica and Australia). These, in turn, broke up. By the end of the period, most of the continents were close to their present positions. Alaska and Siberia were joined by a land bridge, as were Canada, Greenland, and western Europe. Antarctica and Australia were still connected, India was still an island, Central America was a string of islands, and Europe and Africa were separated by the Tethys Sea. In North America, the Rocky Mountains formed, and sediments washed from the highlands were carried by rivers into a shallow mid-continental sea, forming a well-irrigated floodplain where dinosaurs and other animals flourished.

Flowering plants were prominent in the Cretaceous landscape. Forests of oak, hickory and magnolia spread across huge areas, with swamp cypresses and giant sequoias growing in the wetlands. Dinosaurs became more diverse, adapting to the wide range of environments and the new, tough-leaved plants. Herbivores became smaller, and predators more common. Many familiar modern species were widespread – including butterflies, bees, ants, termites, snakes, softshelled turtles, frogs, salamanders, gulls, wading birds, shrews, and opossums.

Oxygen content of the air during the Cretaceous may have been as high as 30%. This will make visitors Overconfident, with IQ rolls at -1; it will also hasten corrosion, and increase the risk of fire. Higher oxygen concentrations may also dry out their eyes; roll HT+2 every minute, with every failure reducing Vision by 1. Time travelers from a world with experience of space travel (late TL7+) can protect against this by wearing reducing respirators with goggles. GMs should ignore this if it interferes with play.

"Those which have feathers, and bite"

Though some paleontologists have depicted dinosaurs as furry or feathered, the only fossilized dinosaur skins discovered so far have had scaly hides. Some pterosaur fossils show impressions of what seems to be fur, and *Archaeopteryx* remains include unmistakable feathers. None of these fossils give any hint as to the animals' color. However, it is possible to make some intelligent guesses.

Many species of dinosaurs had large eyes, suggesting that they had color vision. As most plants were drab (dark greens and browns) until the Cretaceous, the only colorful things around would be other animals. Some dinosaurs may have used bright colors for courtship and ritual aggression, or stripes or spots as camouflage, as many species of birds and reptiles do today.

Some artists have assumed that dinosaurs and pterosaurs were colored or patterned like modern animals which fill the same role in a similar environment. Thus, a human-sized predator which lives in the forests and depends on stealth may be striped or spotted like one of the big cats. Arctic predators are usually white, as are many of the animals which try to hide from them; most desert animals are sandy-colored. Nocturnal hunters are often gray or black. The giant sauropods and theropods were too large to hide, and could have been any color, but smaller, defenseless herbivores may have been camouflaged – zebra or okapi stripes would have suited low-feeding hadrosaurs, while ankylosaurs and nodosaurs would have been better off looking like rocks (complete with lichens and moss). Ceratopsians were probably a rock-like gray from behind, but may have been as colorful as mandrills from the front, for similar reasons: some artists have even imagined gigantic eye-spots on their frills, to make them look more threatening. Similarly, the tail-clubs of the ankylosaurs may have been adorned with eye-spots, to fool predators into mistaking them for the heads of long-necked herbivores and attacking that less-vital end. Stegosaurs' plates would also have been more effective as a deterrent, or as a sexual display, if they were brightly colored; as the plates were also areas of high blood flow, they may well have been red.

The same guidelines are often used for pterosaurs; *Dimorphodon* is often shown with the colorful bill of a puffin, *Pteranodon* with the white underside of an albatross, etc.

GMs needn't worry about being consistent with these color schemes: after all, not all dinosaurs of the same genus need be the same color.

The Great Extinction

Dinosaurs, pterosaurs and plesiosaurs became extinct approximately 65 million years ago. This extinction has been blamed on an asteroid impact that created an iridium-rich layer at the Cretaceous/Tertiary (K/T) boundary and an impact crater near the Gulf of Mexico, but dinosaurs disappeared at different times around the world, and the details are still uncertain.

Dinosaurs apparently became extinct in Canada 150,000 years before the K/T, but mosasaurs existed in the same area right up to the boundary. In Europe and Asia, dinosaurs survived until much closer to the K/T; in Australia, dinosaur fossils have been found in rocks which may be above the boundary.

Evidence suggests that dinosaurs were declining long before the impact, which, at worst, hastened the process. The fossil record suggests that 75 million years ago there were 35 dinosaur genera; by 68 mya, this number had dropped to 25, and by the end of the Cretaceous, to only six. Many species of sharks, lizards, marsupials and plants also declined and became extinct during this time.

Dramatic changes in sea level during the late Cretaceous may have been responsible for this decimation. Land bridges may have enabled *Triceratops* and *T. rex* to dominate new areas, wiping out established species. Floods may have turned plains into swamps and hills into islands, preventing normal migration and trapping the dinosaurs in areas which could no longer support so many large animals.

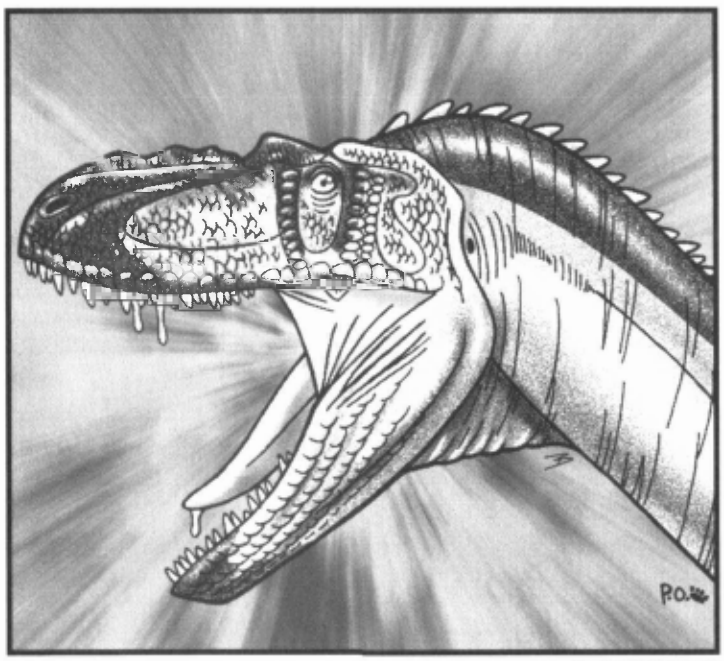
For GMs who want the dinosaurs to end with a bang, not a whimper, other (less likely) explanations of their disappearance include increased volcanic activity, cosmic rays, intelligent dinosaurs with guns, and alien hunters.

PREDATORS

Abelisaurus

Time: Late Cretaceous (73-65 mya)
Range: S. America **Habitats:** S, F
Discovered: 1985

Abelisaurus is a 22' long theropod, related to *Carnotaurus*. Use *Daspletosaurus* statistics.



Albertosaurus

Acrocanthosaurus

ST: 90-110 **Speed/Dodge:** 11/6 **Size:** 13+
DX: 13 **PD/DR:** 2/2# **Wt:** 3-5 tons
IQ: 3 **Damage:** 4d+2 imp#
HT: 14/40-50 **Reach:** C, 1 **Habitats:** P, F
Time: Early Cretaceous (115-105 mya)
Range: N. America **Discovered:** 1950

Acrocanthosaurus is a 40' long theropod with a 2' high ridge of bony spikes along its backbone (its name means "high-spined lizard"). These spikes help protect the spinal column (DR 6), and also anchor powerful neck, back and tail muscles.

Apart from the ridge on its back, and its lack of horns, *Acrocanthosaurus* closely resembles *Allosaurus*, from which it may have been descended. It claws in close combat for 1d cutting damage, tramples with its taloned hind-feet for 2d+1 crushing damage, or bites for 4d+2 impaling damage with a 1-hex reach.

Albertosaurus

ST: 70-90 **Speed/Dodge:** 13/7 **Size:** 14+
DX: 14 **PD/DR:** 2/2 **Wt:** 2-3½ tons
IQ: 3 **Damage:** 4d imp
HT: 14/35-40 **Reach:** C, 1 **Habitats:** P, F
Time: Late Cretaceous (76-68 mya)
Range: N. America **Discovered:** 1905

Albertosaurus sarcophagus ("flesh-eating lizard from Alberta") is an early tyrannosaurid. It is slightly smaller than *Tyrannosaurus rex*, growing to 32' long and standing up to 18' tall. Its hind limbs are long, and its build light, making it a faster

runner than most theropods. It may also be stealthier: Stealth-14. Its two-fingered forelimbs are slightly larger than those of *T. rex,* but still useless in combat; instead, it bites at 1-hex range for 4d impaling damage, using its taloned hind feet to pin down small prey (Contest of ST).

A solitary hunter, it preys mostly on hadrosaurs, hypsilophodonts and other medium-sized, fast-moving herbivores. It is also a strong swimmer, propelling itself with its powerful tail as crocodiles do; its Move in water is 7, Dodge 6.

Allosaurus see p. 29

Allosaurus died out at the end of the Jurassic in North America, but it seems to have survived for millions of years longer in Australia, well into the Early Cretaceous.

Baryonyx

ST: 70-80 **Speed/Dodge:** 11/7 **Size:** 13+
DX: 14 **PD/DR:** 2/2 **Wt:** 1-2 tons
IQ: 3 **Damage:** 4d+2 imp#
HT: 14/35-40 **Reach:** C, 1, 2 **Habitats:** P, S#
Time: Early Cretaceous (125-105 mya)
Range: Europe **Discovered:** 1983

Baryonyx ("heavy claw") is a 30' long theropod with a long, crocodile-like snout, twice as many teeth as most theropods, and larger-than-usual forelimbs ending in foot-long talons. It may be a fish-eater, living near rivers and using its talons to spear fish in the water as bears do. A slash with its claws does 4d+2 impaling at up to 2-hex range; it can also bite at up to 2-hex range for 4d cutting damage.

Borogovia

ST: 10-13 **Speed/Dodge:** 12/7 **Size:** 1-2
DX: 15 **PD/DR:** 0/1 **Wt:** 90-150 lbs.
IQ: 3-4 **Damage:** 1d-1 imp
HT: 10-11 **Reach:** C, 1 **Habitats:** P, F
Time: Late Cretaceous (80-70 mya)
Range: Asia **Discovered:** 1987

Borogovia (named after the borogoves from Lewis Carroll's *Jabberwocky*) is a lightly-built long-legged troodontid, 6' to 7' long. Like *Troodon,* it has a sharp sickle-like claw on each hind foot; however, this claw is not hinged to be held clear of the ground, and does only 1d-1 impaling damage. *Borogovia* is omnivorous, eating plant life, carrion and small prey.

Bruhathkayosaurus

ST: 120-180 **Speed/Dodge:** 9/6 **Size:** 40+
DX: 12 **PD/DR:** 2/2 **Wt:** 12-15 tons
IQ: 3 **Damage:** 6d+2 imp
HT: 15/80-90 **Reach:** C, 1, 2 **Habitat:** P
Time: Late Cretaceous (74-65 mya)
Range: India **Discovered:** 1987

Bruhathkayosaurus (from the Sanskrit word "bruhathkaya," meaning "huge body") may be the largest meat-eater ever to walk the earth – 60' to 65' long, and standing 30' tall, it dwarfs even *Spinosaurus* and *Tyrannosaurus.* Unfortunately, the only evidence of its existence is a few enormous leg bones first described in 1989, which might belong to a sauropod; it is included here as a "super-theropod" for cinematic campaigns.

Bruhathkayosaurus is more robust than *T. rex,* and is probably slower and less agile, but its size may enable it to attack such slow-moving but well-defended local herbivores as *Dravidosaurus* and the titanosaurids. It might also steal the kills of smaller theropods such as *Indosuchus.*

Carnotaurus

Carnotaurus

ST: 55-70 **Speed/Dodge:** 10/7 **Size:** 12+
DX: 14 **PD/DR:** 2/3 **Wt:** 1-2 tons
IQ: 3 **Damage:** 3d imp#
HT: 14/40-50 **Reach:** C, 1 **Habitats:** P, F
Time: Middle – Late Cretaceous (113-91 mya)
Range: S. America **Discovered:** 1985

Carnotaurus ("carnivorous bull") is a short-faced theropod with two short horns projecting over its eyes (similar to those of *Allosaurus,* but larger). The purpose of these horns is unknown, but they may be used in head-butting contests between males, or to give some protection to the eyes (which are set to give both peripheral vision and depth perception: Vision rolls at 14, other senses at 12).

Carnotaurus is 25' long, and stands about 10' tall. Its back legs are long, but its arms are even smaller and weaker than those of *Tyrannosaurus* (ST 6-7). Its hide is rough, and studded with small bony lumps (DR 3), which may give it a spotted appearance. *Carnotaurus* bites in close combat for 3d impaling damage, or head-butts for 3d crushing.

Daspletosaurus

ST: 70-80 **Speed/Dodge:** 9/7 **Size:** 13+
DX: 13 **PD/DR:** 2/2 **Wt:** 3-5 tons
IQ: 3 **Damage:** 3d+2 imp#
HT: 14/35-40 **Reach:** C, 1 **Habitats:** S, F, P
Time: Late Cretaceous (76-72 mya)
Range: N. America **Discovered:** 1970

Daspletosaurus ("frightful reptile") is a heavily-built 30' long theropod. It has large triangular bones above its eyes, and a smaller pair of horns behind them.

Daspletosaurus is a slower runner than the more lightly built *Albertosaurus.* Its two-clawed forelimbs are slightly longer than those of most Cretaceous tyrannosaurs, and rake for 1d cutting damage, but their main use is for grappling (see p. B111) its prey. It lives in the marshlands near streams and rivers, and ambushes slower-moving herbivores as they came to the water to drink – including ceratopsians, and the boneheaded pachycephalosaurs.

Deinocheirus

ST: 70-80 **Speed/Dodge:** 13/7 **Size:** 13+
DX: 14 **PD/DR:** 1/1 **Wt:** 1-2½ tons
IQ: 3 **Damage:** 4d+2 cut#
HT: 14/35-40 **Reach:** 1-3# **Habitats:** P, F
Time: Late Cretaceous (75-65 mya)
Range: Asia **Discovered:** 1970

Deinocheirus ("terrible hand") is a giant ornithomimid growing up to 40' long. Its arms are 8' long, and slender, and end in huge hands with three long claws. It slashes for 4d+2 cutting damage at up to 3-hex range.

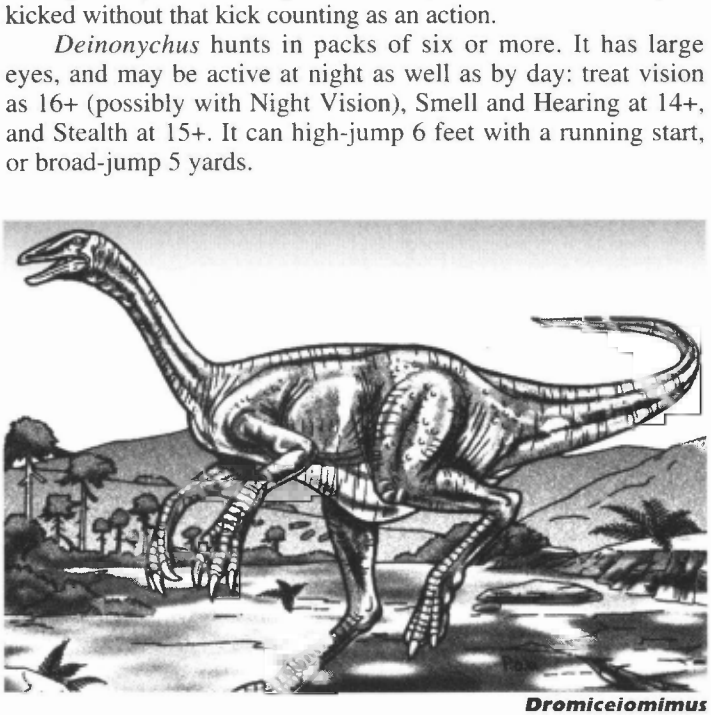
Deinonychus

ST: 14-17 **Speed/Dodge:** 13/8 **Size:** 2-3
DX: 16 **PD/DR:** 1/1 **Wt:** 120-200 lbs.
IQ: 3-4 **Damage:** 1d+2 imp#
HT: 13/12-14 **Reach:** C, 1, 2# **Habitats:** P, F
Time: Early Cretaceous (140-130 mya)
Range: Asia, N. America **Discovered:** 1964

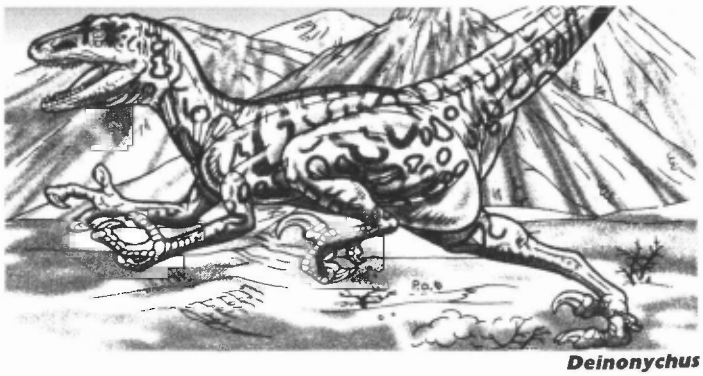
The discovery of *Deinonychus* ("terrible claw") by Dr. John Ostrom in 1964 was largely responsible for the modern concept of the hot-blooded dinosaur – fast, birdlike, and fairly intelligent. *Deinonychus* is only 8' to 10' long including a rigid tail, and stood around 3½ feet high, but it can bring down large prey such as *Tenontosaurus* by using pack tactics, speed, and the claws for which it was named.

Deinonychus has a 5" long sickle-shaped claw on the second toe of each hind foot, which is held up off the ground to keep it sharp. This claw does 1d+2 impaling damage at close or 1-hex range. *Deinonychus* attacks large prey by leaping at up to 2-hex range, increasing damage to 2d+1 impaling, and holding on with its teeth and foreclaws (1d cutting damage), then slashing with its hind feet. Against smaller opponents (such as time travelers), it stands on one leg to kick with the other, doing 1d+2 impaling damage. Anyone entering the *Deinonychus'* front hex may be kicked without that kick counting as an action.

Deinonychus hunts in packs of six or more. It has large eyes, and may be active at night as well as by day: treat vision as 16+ (possibly with Night Vision), Smell and Hearing at 14+, and Stealth at 15+. It can high-jump 6 feet with a running start, or broad-jump 5 yards.



Dromiceiomimus



Deinonychus

Deinonychus is often depicted as having tiger stripes or leopard spots. While there is no evidence for this (nor for the idea that it was covered with feathers or fur), such a color scheme would certainly suit its style. If it is a night hunter, something in basic black would be appropriate.

Dromaeosaurus

ST: 10-13 **Speed/Dodge:** 14/7 **Size:** 1-2
DX: 15 **PD/DR:** 0/1 **Wt:** 35-45 lbs.
IQ: 3-4 **Damage:** 1d+1 imp
HT: 10-11 **Reach:** C, 1 **Habitats:** P, F
Time: Late Cretaceous (76-72 mya)
Range: N. America **Discovered:** 1922

Dromaeosaurus ("swift-running lizard") is a 6' long relative of *Deinonychus,* with a 3" killing claw. Like *Deinonychus,* it is agile and fast, and may hunt in packs. Treat as a small *Deinonychus* in most respects.

Dromiceiomimus

ST: 14-17 **Speed/Dodge:** 18/7 **Size:** 2-3
DX: 15 **PD/DR:** 1/1 **Wt:** 200-225 lbs.
IQ: 3 **Damage:** 1d cr
HT: 14/13-15 **Reach:** C, 1 **Habitat:** P
Time: Late Cretaceous (75-70 mya)
Range: N. America **Discovered:** 1926

The ostrich-like *Dromiceiomimus* ("emu mimic") may be the fastest dinosaur on two legs, able to run at 40 mph: some paleontologists estimate its top speed at over 50 mph (Move 22). *Dromiceiomimus* has no other means of defense; its beak is toothless, its jaw muscles weak, its claws small, and its fingers lack the strength for grasping large prey. If threatened, it runs; if it has to fight, it can kick or bite for 1d crushing damage, or claw for 1d-3 cutting damage. It eats insects, eggs, mammals and reptiles small enough to swallow whole, and carrion.

Dromiceiomimus grows to 12' long, and stands 7' tall. Its head is small, but its eyes are nearly three inches wide (Vision-16). Some scientists think its pelvic structure indicates it gave birth to live young.

Dryptosaurus

ST: 50-65 **Speed/Dodge:** 12/7 **Size:** 9+
DX: 14 **PD/DR:** 2/2 **Wt:** ½-1½ tons
IQ: 3 **Damage:** 3d-1 imp#
HT: 14/40-50 **Reach:** C, 1 **Habitat:** P
Time: Late Cretaceous (70-65 mya)
Range: N. America **Discovered:** 1866

The first carnivorous dinosaur discovered in North America, *Dryptosaurus* ("tearing lizard," previously known as *Laelaps*) is a lightly-built 20' long theropod with unusually long forelimbs and at least one very large claw (over 9" long) on each hand. These claws may have been used for prying armor plates from ankylosaurids – a more useful tool for a scavenger than a predator. *Dryptosaurus* is also fast enough to run down hadrosaurids, and its claws are a formidable weapon.

Dryptosaurus can claw or bite in close combat or at 1-hex range for 3d-1 impaling damage. It stands 12' to 15' tall.

Estesia

ST: 16-20 **Speed/Dodge:** 9/7 **Size:** 4
DX: 14 **PD/DR:** 1/2 **Wt:** 200-300 lbs.
IQ: 3 **Damage:** 1d cut#
HT: 16/16-20 **Reach:** C **Habitats:** D, P
Time: Late Cretaceous (80-70 mya)
Range: Asia **Discovered:** 1993

The 12' *Estesia* is not a dinosaur but a varanid lizard, very similar to the modern Komodo dragon, with poison sacs like those of a Gila monster. Like a Gila monster, it has no hollow fangs, but has to bite and hold on for several seconds while venom flows out of its mouth and into the victim's bloodstream. Anyone bitten by an *Estesia* has 1d+1 seconds to pry open its jaws before the venom takes effect; this requires a regular Contest of ST. If this fails, the person bitten must make a roll against HT-6; a failed roll means that the victim takes 2d+2 damage, a critical failure means death. Anyone taking damage will also be nauseated and dizzy for 1d hours (-3 to all attribute checks and skills); anyone who makes their HT-6 roll takes no damage, but suffers from the side effects for 3d minutes.


Estesia

Gallimimus

ST: 18-22 **Speed/Dodge:** 17/7# **Size:** 4-6
DX: 15 **PD/DR:** 1/1 **Wt:** 400-500 lbs.
IQ: 3 **Damage:** 1d+2 cr
HT: 15/18-20 **Reach:** C, 1 **Habitats:** D, P
Time: Late Cretaceous (75-70 mya)
Range: Asia **Discovered:** 1930

Gallimimus ("chicken mimic") is a 13' to 17' long bird-like dinosaur, similar to *Dromiceiomimus* in appearance and lifestyle. It has a long, flexible neck and a very long toothless beak, and lives on large insects and small vertebrates rather than hunting large prey. It has good peripheral vision (Vision-16) but poor depth perception, and is hunted by medium-sized theropods. If cornered, it can kick or bite for 1d+2 crushing damage, or claw for 1d-4 cutting damage (its hands are even smaller than those of *Dromiceiomimus*).

Some paleontologists have speculated that *Gallimimus* may have been able to run at over 50 mph (Move 24).

Giant Crocodile (Phobosuchus)

ST: 48-58 **Speed/Dodge:** 8/6# **Size:** 14-17
DX: 13 **PD/DR:** 3/4# **Wt:** 5-10 tons
IQ: 3 **Damage:** 3d+2 cut
HT: 14/40-50 **Reach:** C, 1# **Habitat:** FW
Time: Late Cretaceous (80-65 mya)
Range: N. America

Phobosuchus ("Horror Crocodile," also known as *Deinosuchus*, "Terrible Crocodile") grows to a length of 50', with a 7' skull. It ambushes dinosaurs that come to the water to drink, biting for 3d+2 cutting damage with a 1-hex reach; its tail-whip does 4d crushing damage with a 4-hex reach. Treat it as a modern crocodile (p. 22) in most other respects.

Giganotosaurus

ST: 100-160 **Speed/Dodge:** 16/7# **Size:** 15+
DX: 14 **PD/DR:** 2/3 **Wt:** 5-9 tons
IQ: 3 **Damage:** 5d+3 imp
HT: 15/50-90 **Reach:** C, 1, 2 **Habitats:** P, F
Time: Late Cretaceous (100 mya)
Range: S. America **Discovered:** 1993

Tyrannosaurus rex has now been dethroned as the world's largest predatory dinosaur. The first, nearly-complete specimen of *Giganotosaurus* ("giant southern lizard") unearthed in Argentina was slightly bigger, and much more heavily built, than any *T. rex* yet found. *Giganotosaurus* lived 30 million years before *T. rex*. It seems to have been more closely related to *Allosaurus*, and probably looked like an enormous (46 feet!) version of that creature.

It stands 21' high; its skull has DR 4. Its three-clawed arms have ST 14-15. Treat it in other ways like a slightly bigger *T. rex*.

Indosuchus

Time: Late Cretaceous (70-65 mya)
Range: India **Habitats:** P, F
Discovered: 1917

Indosuchus ("Indian crocodile") is a 25' long theropod, similar to *Carnotaurus* in appearance and behavior. Use *Carnotaurus* statistics.

Madtsoia

ST: 20-24 **Speed/Dodge:** 4/6 **Size:** 7-11
DX: 13 **PD/DR:** 0/0 **Wt:** 100-250 lbs.
IQ: 3 **Damage:** 1d crushing
HT: 15/20-30 **Reach:** C **Habitats:** F, J
Time: Late Cretaceous (80-65 mya)
Range: Africa, S. America

Madtsoia is a large snake, 25' to 30' long when full grown. Like modern pythons, it attacks by constricting, "grappling" its prey (see p. B111), and then doing 1d crushing damage per turn with its coils until killed or forced off.

Ornithomimus

Time: Late Cretaceous (76-70 mya)
Range: N. America **Habitats:** S, F
Discovered: 1890

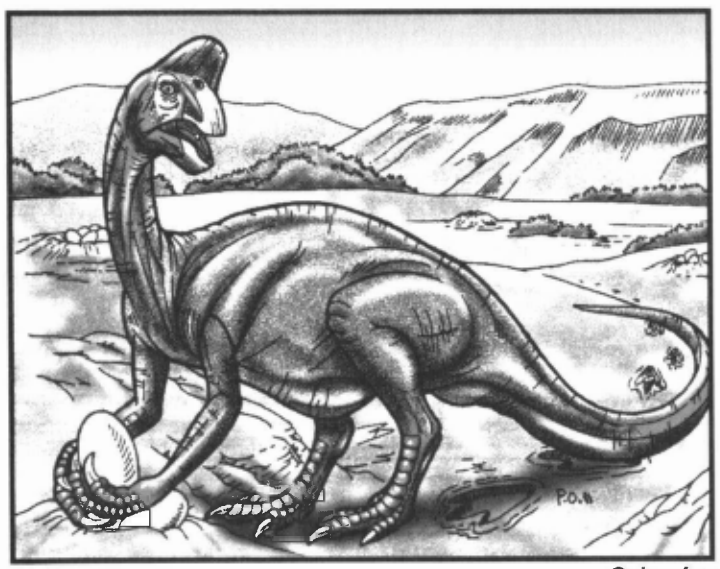
Ornithomimus ("bird mimic") is a 12' long bird-like dinosaur, similar to *Dromiceiomimus* in appearance and habits, but with larger, more nimble hands (1d-1 cutting damage). Treat as *Dromiceiomimus* in all other respects.

Oviraptor

ST: 9-12 **Speed/Dodge:** 13/7 **Size:** 1-2
DX: 15 **PD/DR:** 0/1 **Wt:** 80-100 lbs.
IQ: 3 **Damage:** 1d-1 cut#
HT: 9-10 **Reach:** C, 1 **Habitats:** D, P
Time: Late Cretaceous (88-70 mya)
Range: Asia **Discovered:** 1924

Oviraptor ("egg robber") is a very lightly-built 6' long dinosaur with a crested skull, large eyes, and a short, toothless beak. Its hands are large, with well-developed four inch claws that rake for 1d-1 cutting damage; its bite does 1d crushing damage, and can crack much tougher things than eggs.

Oviraptor eats small vertebrates, including fish and the young of other dinosaurs. While it also eats eggs when it can get them (most omnivores will), the famous fossilized eggs found near *Oviraptor* skeletons are now known to be *Oviraptor* eggs (not *Protoceratops* eggs, as is previously thought). And recent fossil discoveries show that *Oviraptor* guards its nests, sitting on the eggs to incubate them.



Oviraptor

Saurornithoides

Time: Late Cretaceous (85-65 mya)
Habitats: P, F, S **Range:** Asia
Discovered: 1924

Saurornithoides is a 6' long birdlike dinosaur, very similar to *Troodon.* Use *Troodon* statistics.

Saurornitholestes

ST: 6-8 **Speed/Dodge:** 15/7 **Size:** 1-2
DX: 15 **PD/DR:** 0/1 **Wt:** 30-50 lbs.
IQ: 4-5 **Damage:** 1d-3 imp
HT: 10/3-4 **Reach:** C, 1 **Habitats:** P, F
Time: Late Cretaceous (76-73 mya)
Range: N. America **Discovered:** 1924

The 6' long *Saurornitholestes* is similar to the better-known *Velociraptor* and *Dromaeosaurus,* with sickle claws on its hind feet and a rigid tail; however, it has a larger brain and a less developed sense of smell (Vision-16, Hearing-14, Smell-12).

Spinosaurus

ST: 100-150 **Speed/Dodge:** 11/6 **Size:** 15+
DX: 13 **PD/DR:** 2/3 **Wt:** 3-4 tons
IQ: 3 **Damage:** 5d imp#
HT: 15/50-80 **Reach:** C, 1, 2 **Habitats:** P, F, D
Time: Late Cretaceous (98-95 mya)
Range: Africa **Discovered:** 1915

Spinosaurus is a heavily-built theropod up to 40' long, with a huge sail on its back similar to that of *Dimetrodon.* This sail may be used to radiate excess heat (like the ears of elephants); it may also be used a sexual display, as a means of intimidating other theropods away from prey, or as a form of mimicry enabling *Spinosaurus* to mingle with the fin-backed herbivore *Ouranosaurus. Spinosaurus* is a scavenger rather than a predator; its sail is very vulnerable to attack and makes high-speed maneuvering very difficult, and its teeth lack serrated edges.

Spinosaurus is one of the largest theropods; only *Bruhathkayosaurus, Giganotosaurus* and some tyrannosaurs are bigger. Unlike *T. rex,* it has large forelimbs, that can grapple with its full strength. Its feet can pin down smaller or weakened prey (Contest of ST to pin; does 3d cutting damage), but its main attack is its bite, doing 5d impaling damage with a 2-hex reach.

Struthiomimus

ST: 14-17 **Speed/Dodge:** 15/7 **Size:** 3-4
DX: 15 **PD/DR:** 1/1 **Wt:** 250-300 lbs.
IQ: 3-4 **Damage:** 1d+1 cut#
HT: 14/13-15 **Reach:** C, 1 **Habitats:** P, F, J
Time: Late Cretaceous (76-70 mya)
Range: N. America **Discovered:** 1902

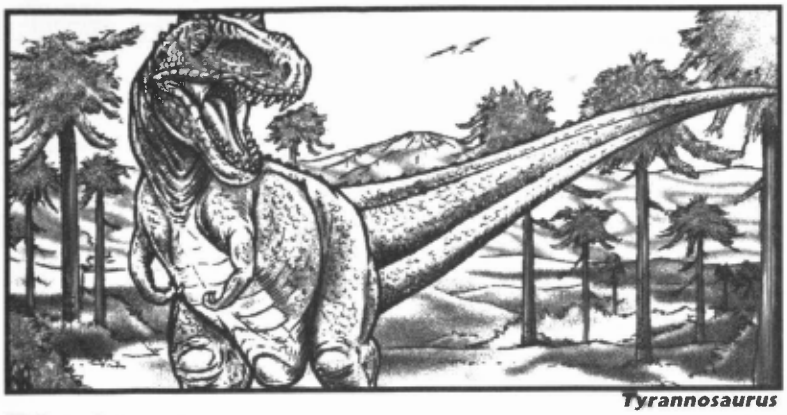
Struthiomimus ("ostrich mimic") is a 13' long dinosaur standing about 8' tall. It is very similar to *Dromiceiomimus* in appearance, with a long neck and small toothless head. Its forelimbs and fingers are longer and more powerful than those of *Dromiceiomimus,* with recurved claws able to inflict 1d+1 cutting damage. It can also kick or bite for 1d-1 crushing damage.

Therizinosaurus

ST: 30-40 **Speed/Dodge:** 6/5 **Size:** 9-12
DX: 11 **PD/DR:** 1/1 **Wt:** 2-2½ tons
IQ: 3 **Damage:** 3d imp#
HT: 15/30-40 **Reach:** C-3 **Habitats:** F, P
Time: Late Cretaceous (77-69 mya)
Range: Asia **Discovered:** 1948

Therizinosaurus ("reaper lizard") is a theropod with 8' arms which end in sickle-shaped claws. These claws, nearly a yard long, do 3d impaling damage. It can also bite for 2d impaling damage.

No complete skeletons are known, and its habits are still in dispute. Some paleontologists have suggested that its large claws could be used for fishing, or for tearing apart termite nests. Others think it was an omnivore, or even a herbivore which used its claws to pull down branches like the giant sloth.



Tyrannosaurus

Timimus

Time: Early Cretaceous (113-97.5 mya)
Range: Australia **Habitats:** S, F
Discovered: 1993

Timimus is a 10' long birdlike dinosaur, slightly smaller than *Dromiceiomimus* but otherwise similar in appearance and habits. Treat as *Dromiceiomimus* in all other respects.

Troodon

ST: 14-17 **Speed/Dodge:** 11/8 **Size:** 2-3
DX: 16 **PD/DR:** 1/1 **Wt:** 30-50 lbs.
IQ: 4-5 **Damage:** 1d+1 imp
HT: 13/12-14 **Reach:** C, 1 **Habitats:** P, F, S
Time: Late Cretaceous (75-65 mya)
Range: N. America, Asia **Discovered:** 1856

Troodon ("wounding tooth") is a man-tall, slender, nimble-fingered, rather birdlike omnivorous dinosaur. It resembles *Deinonychus* in having a razor-sharp sickle-like claw on each hind foot which it keeps off the ground, but is more closely related to the ornithomimids. It also has the largest brain-to-body-mass ratio of any Cretaceous creature, including the mammals it eats.

Troodon has huge eyes, turned forward like those of a human or cat. It may be a nocturnal hunter, stealthily taking eggs and young from herbivore nesting colonies while the adults are asleep (Night Vision, Vision-18, Stealth-16).

Canadian paleontologist Dr. Dale Russell chose *Troodon* as the most likely candidate for evolving into an intelligent "dinosauroid" – an australopithecine-sized biped with a large head, an erect stance, three-fingered hands with opposable thumbs, and no tail.

Tyrannosaurus

ST: 100-150 **Speed/Dodge:** 17/7# **Size:** 13+
DX: 14 **PD/DR:** 2/3 **Wt:** 4-6 tons
IQ: 3 **Damage:** 5d+2 imp
HT: 15/50-80 **Reach:** C, 1, 2 **Habitats:** P, F
Time: Late Cretaceous (68-65 mya)
Range: N. America, Asia **Discovered:** 1902

Tyrannosaurus rex ("King of the Tyrant Lizards") is one of the most famous of dinosaurs, thanks largely to its major roles in films including *Fantasia*, *Jurassic Park* and *Caveman*. It was also one of the most widespread, and one of the last to become extinct. It grows up to 40' long, and stands 20' high; its massive skull (DR 4) is over 4' long, with 6" saw-edged teeth, and its jaw is well-muscled, allowing it to rip off 500 pounds of meat in a bite. Its arms are less than three feet long, ending in two claws (not used in combat), and have ST 14-15. Its long and powerful hind legs and bird-like feet let it outrun most herbivores, and may also be used to pin down small or weak prey (Contest of ST to pin; does 3d cutting damage). It bites for 5d+2 impaling damage.

Tyrannosaurus has well-developed stereoscopic vision and good hearing, and probably an excellent sense of smell; make all sense rolls at 14.

A huge *Tyrannosaurus* skeleton found in South Dakota in 1990 showed claw and tooth wounds that had healed, suggesting that *T. rex* is an aggressive hunter and killer, not merely a scavenger. It preys mostly on hadrosaurs and ceratopsians, and often chases smaller theropods away from their kills as lions do to hyena. *Tyrannosaurus* travel in small family groups, at least for part of the year.

Estimates of *Tyrannosaurus* running speeds vary from a conservative 15 mph to Bob Bakker's 50 mph (Move 24!). Lessem and Horner, in *The Complete T. Rex*, point out that a *Tyrannosaurus* running at 25 mph (Move 12) can catch any Cretaceous herbivore big enough to bother with, and that moving any faster increases the risk of falling and being unable to get up again. Jim Farlow has calculated that a *Tyrannosaurus* might survive a fall at 34 mph, but not 45 mph. As a 20' tall *Tyrannosaurus* falling onto hard ground would take 6d-12 damage. GMs may assume that *Tyrannosaurus* can move faster than 34 mph (Move 17), but rarely do.

Utahraptor

ST: 30-35 **Speed/Dodge:** 13/7 **Size:** 6-7
DX: 15 **PD/DR:** 1/1 **Wt:** 600-800 lbs.
IQ: 3-4 **Damage:** 3d+1 imp#
HT: 15/30 **Reach:** C, 1, 2 **Habitat:** P
Time: Early Cretaceous (125-119 mya)
Range: N. America **Discovered:** 1991

Utahraptor is very like *Deinonychus* in all respects but size; 20' long and standing 8' tall, with 15" toe claws, it is the perfect dinosaur for a ***Horror*** adventure – a killing machine small enough to hide in alleys, sewers and subways.

Utahraptor's killing claw is held up off the ground to keep it sharp, and does 3d+1 impaling damage at up to 2-hex range. Against small opponents, it stands on one leg to kick with the other; large prey are brought down with a flying strike doing 4d-1 impaling damage. A small pack of *Utahraptor* can easily disembowel the largest sauropods.

Velociraptor

ST: 7-9 **Speed/Dodge:** 15/7 **Size:** 1-2
DX: 15 **PD/DR:** 0/1 **Wt:** 35-40 lbs.
IQ: 3-4 **Damage:** 1d-1 imp
HT: 12/5-6 **Reach:** C, 1 **Habitats:** P, F
Time: Late Cretaceous (85-80 mya)
Range: Asia **Discovered:** 1924

Velociraptor ("swift robber") is a 6' long predator. Like the slightly larger *Deinonychus*, to which it is related, it has a large, sickle-shaped claw on each hind foot, which is held up off the ground to keep it sharp. This "raptor claw" does 1d+1 impaling damage at close or 1-hex range; *Velociraptor* attacks by grappling

with its sharp teeth and foreclaws (1d cutting damage), then slashing with its raptor claws. It can open its jaws wide enough to bite or swallow large prey; one fossilized *Velocirap-tor* was found locked in combat with a *Protoceratops* more than twice its weight.

Dangerous as it is, *Velociraptor* is smaller and probably slower-moving than the raptors of *Jurassic Park,* and there is no evidence to suggest that it is as intelligent as an ape; in fact, it has a smaller brain for its size than most other dromaeosaurs.

Velociraptor

HERBIVORES

CERATOPSIANS

The ceratopsians ("horn-faces") are large, short-necked, strictly quadrupedal herbivores, distinguished by the huge bony frills that adorn their heads and anchor their neck and jaw muscles. Most have at least one horn large enough to deter, and possibly injure or kill, theropods. Though ceratopsian skeletons have been found with wounds inflicted by jousting with other ceratopsians, the only fossil evidence of a fight between ceratopsians and carnivorous dinosaurs is a *Velociraptor* discovered grappling with a hornless *Protoceratops.*

The ceratopsians' short necks are powerful and extremely mobile, enabling them to use their horns in close combat like a spiked shield. Their strong leg muscles enable them to run at high speeds, at least in short bursts. A hornface's charge might be intended as a bluff; like modern rhinos, they probably have difficulty hitting moving targets. Being small-brained, if they miss their intended victim, they might well forget them immediately – unless their young are endangered. Male ceratopsians also duel with each other, and might be very dangerous during the mating season, mistaking ATVs for rivals and charging them, doing considerable damage to both the vehicles and themselves.

A ceratopsian must make a roll against HT when it butts a smaller target (such as a *Troodon* or time traveler), at +5 if it is moving at less than 3 hexes a turn. If it fails, the ceratopsian is stunned; on a critical fail, it can break its horn(s). It takes no actual damage unless it head-butts a target of similar or larger size, such as another ceratopsian or a car; in that case, it takes damage only if loses a Contest of ST by 10 or more points. Damage taken is equal to half the damage normally done by the animal it is butting heads with, or half the damage it normally does itself if it butts an inanimate object such as a car.

Centrosaurus

A ceratopsian's horns can get stuck (see p. B96) if it makes a successful charge at a large target, but most ceratopsians will make their ST rolls to unstick it automatically. A smaller target impaled in a charge may get stuck on the horns, and – assuming he survives and remains conscious – have to remove himself. If this fails, the ceratopsian will try to remove his body by bashing him against a tree (treat as trampling damage) until the body falls to pieces, or some similarly gentle method.

Ceratopsians travel in herds, and migrate great distances, especially when the weather begins to cool in the Late Cretaceous. Anything in the path of a stampeding herd of ceratopsians would take damage first from the head butts (crushing rather than impaling, unless the hornfaces are actually targeting them) and then, after being knocked down, half normal trampling damage from every ceratopsian to pass through that hex. See p. 32 for Stampeding rules.

Anchiceratops

ST: 100-150 **Speed/Dodge:** 10/6 **Size:** 8-14
DX: 12 **PD/DR:** 2/2# **Wt:** 2-3 tons
IQ: 3 **Damage:** 2d+2 imp#
HT: 16/40-55 **Reach:** C **Habitats:** S, P
Time: Late Cretaceous (73-70 mya)
Range: N. America **Discovered:** 1914

The swamp-dwelling *Anchiceratops* ("horns near eyes") is a medium-sized ceratopsian with a long, rectangular frill, the edge of which is adorned with large bony knobs. Its brow horns are curved outwards, and much longer than its nose horn. It is smaller than *Triceratops,* growing to 19' long.

Its frill gives its head, neck and shoulders an effective PD 3 and DR 5. In close combat, its head butt can do 2d+2 impaling damage; it also Blocks as though its shield skill were 12.

An *Anchiceratops* can charge at up to 25 mph, but its outwardly curving horns are at -6 to hit. On a DX roll, it hits with its nose horn for 5d crushing damage; it needs DX -6 to stab a smaller target with its brow horns for 5d impaling damage. It can also trample for 2d+1 crushing damage, or bite in close combat for 4d crushing damage at -4 to hit.

Arrhinoceratops

Time: Late Cretaceous (72-68 mya)
Range: N. America **Habitat:** P
Discovered: 1925

Arrhinoceratops is a three-horned ceratopsian growing up to 19' long. Its skull is 5' long, but its brow horns are relatively small. Use *Anchiceratops* statistics.

Centrosaurus

ST: 100-130 **Speed/Dodge:** 10/6 **Size:** 6-12
DX: 12 **PD/DR:** 1/2 **Wt:** 2-3 tons
IQ: 3 **Damage:** 2d+2 imp#
HT: 16/35-50 **Reach:** C **Habitat:** P
Time: Late Cretaceous (76-72 mya)
Range: N. America **Discovered:** 1876

Centrosaurus ("sharp pointed lizard") is a 20' long, heavily-built ceratopsian. It has an 18" nasal horn, and two very small horns above its eyes. Its frill is broad and extremely elaborate, scalloped and studded with sharp pieces of bone around the edges; like *Chasmosaurus,* it has two hide-covered "windows" in its frill, but they are smaller and protected by two horn-like growths protruding downwards from the top of the frill. The frill gives head, neck and shoulders an effective PD of 3 and DR of 5. In close combat, its nose horn can do 2d+2 impaling damage, and the edge of its frill 1d+1 cutting damage; it also Blocks as though its Shield skill were 12.

A *Centrosaurus* receives no penalty to hit when it charges, and does 5d impaling damage with its nose horn. It can trample for 2d+1 crushing damage, or bite in close combat for 4d crushing damage at -4 to hit.

Chasmosaurus

ST: 80-125 **Speed/Dodge:** 11/6 **Size:** 6-12
DX: 13 **PD/DR:** 1/2# **Wt:** 2-3 tons
IQ: 3 **Damage:** 2d+1 imp#
HT: 16/30-45 **Reach:** C **Habitat:** P
Time: Late Cretaceous (76-70 mya)
Range: N. America **Discovered:** 1901

Chasmosaurus is another medium-sized ceratopsian, growing to 17' long with a 5' skull, with longer, thinner legs than the larger ceratopsians. It is one of the earliest ceratopsians, and very widespread.

Chasmosaurus' lightweight frill looks impressive, but the bone is thin and perforated by two enormous openings (hence its name, "chasm lizard"). Its head has PD 3 and DR 5, but its neck and shoulders have PD 2, DR (1d-1, minimum 2). This frill cannot be used to Block attacks. *Chasmosaurus'* skin is dotted with small knobs of bone, which may give it a spotted appearance.

There are four species of *Chasmosaurus,* the main differences being in the proportions of their three horns. Some have very small horns, doing only 2d+1 crushing damage in close combat, but most have either a large nasal horn or long brow horns which can inflict 2d+1 impaling.

A *Chasmosaurus* can charge at up to 25 mph, with no penalty to hit. Small-horned individuals do 4d+2 crushing damage; long-horns do 4d+2 impaling. It can trample for 2d+1 crushing damage, or bite in close combat for 3d crushing damage at -4 to hit.

Monoclonius

Monoclonius is a scientific name formerly assigned to skeletons with a single nose horn and fairly plain frill. Most paleontologists now believe that the "Monoclonius" skeletons represent the young of other ceratopsian species, who apparently did not develop their elaborate horns and frills until full maturity.

Montanoceratops

ST: 20-30 **Speed/Dodge:** 9/6 **Size:** 2-3
DX: 13 **PD/DR:** 1/1# **Wt:** 400-600 lbs.
IQ: 3 **Damage:** 1d-1 imp#
HT: 15/25-30 **Reach:** C **Habitat:** P
Time: Late Cretaceous (73-70 mya)
Range: N. America **Discovered:** 1942

Montanoceratops is only 6' to 7' long, and stands about 2' high – slightly smaller than the better known *Protoceratops,* but more robust. Unlike other very small ceratopsians, it has a prominent nose horn, which inflicts 1d-1 impaling damage in close combat. Its frill protects its head and neck, giving it PD 2, DR 4.

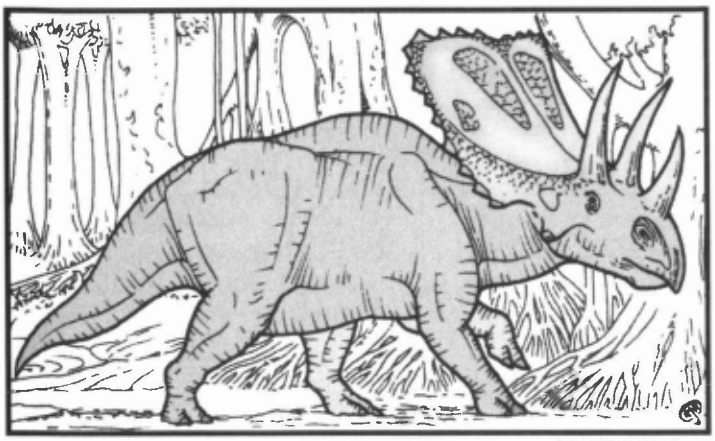
Montanoceratops will run or hide from large theropods, but males joust with each other, and they might charge small predators in defense of their nests. Its charge does 2d-2 impaling damage, with no penalty to hit; it bites in close combat for 1d+2 crushing damage.

Montanoceratops is small enough to hide in undergrowth and dash out without warning, presenting a very small target (-2 to hit). If it seems harmless compared to its larger relatives, think of it as a wild boar wearing football pads – less crafty, but just as short-tempered.

Pentaceratops

ST: 200+ **Speed/Dodge:** 10/6 **Size:** 15+
DX: 12 **PD/DR:** 2/2# **Wt:** 4-5 tons
IQ: 3 **Damage:** 3d imp#
HT: 17/50-75 **Reach:** C **Habitat:** P
Time: Late Cretaceous (75-65 mya)
Range: N. America **Discovered:** 1923

The 26' long *Pentaceratops* is one of the largest ceratopsians, and one of the most impressive looking. Despite its name ("five horn face"), it has only two brow horns and a nasal horn, all of them long; the other "horns" are protruding cheek bones. Its heart-shaped frill is 7½' long, fringed with lumps of bone, and lightened with two long, narrow "windows:" its head and neck have PD 4 and DR 6, but its shoulders have PD 3, DR (1d, minimum 2). This frill can be used to Block attacks as though its Shield skill were 12. In close combat, any of its horns can do 3d impaling damage, and the edge of its frill 1d+1 cutting.



Pentaceratops

A *Pentaceratops* receives no -2 penalty to hit when it charges, and does 6d impaling damage with any horn. On a critical hit, it impales its target with two horns, inflicting damage on two locations, plus any other critical hit effects. On a critical hit against a large target – tyrannosaurs, ATVs, other ceratopsians – it impales with all three horns. It can also trample, or bite in close combat, for 4d crushing damage at -4 to hit. A larger *Pentaceratops* may qualify for the special trampling damage rules (see p. 32).

Protoceratops

ST: 15-25 **Speed/Dodge:** 10/6# **Size:** 2-3
DX: 13 **PD/DR:** 1/2 **Wt:** 300-500 lbs.
IQ: 3 **Damage:** 2d-2 cr#
HT: 15/25-30 **Reach:** C **Habitats:** P, D
Time: Middle – Late Cretaceous (120-77 mya)
Range: Asia, Australia **Discovered:** 1923

Protoceratops ("first horned face") is an 8' long primitive ceratopsian. Despite its name, it has no horns, though males have a bump where later ceratopsians grew a nasal horn. Normally a slow-moving quadruped standing 2' high, it can run at high speed on its hind legs for short distances – its best defense against large theropods. Its frill protects its head and neck, giving it PD 2, DR 4.

Protoceratops males joust with each other, charging for 2d-2 crushing damage with no penalty to hit. They can also bite in close combat for 1d+2 crushing damage.

Styracosaurus

ST: 120-150 **Speed/Dodge:** 9/6 **Size:** 7-13
DX: 12 **PD/DR:** 1/2 **Wt:** 2-3 tons
IQ: 3 **Damage:** 2d+1 imp#
HT: 16/40-60 **Reach:** C **Habitat:** P
Time: Late Cretaceous (77-73 mya)
Range: N. America **Discovered:** 1913

Styracosaurus ("spike lizard") is an 18' long heavily built ceratopsian with a long nasal horn, and two very small horns above its eyes. Its frill is 6½' long, edged with long spikes, and made lighter by two rather small, hide-covered "windows." This frill gives head, neck and shoulders an effective PD of 3 and DR of 5. In close combat, its nose horn does 2d+1 impaling damage, and the edge of its frill 2d+1 cutting damage; it can also Block as though its shield skill were 12.

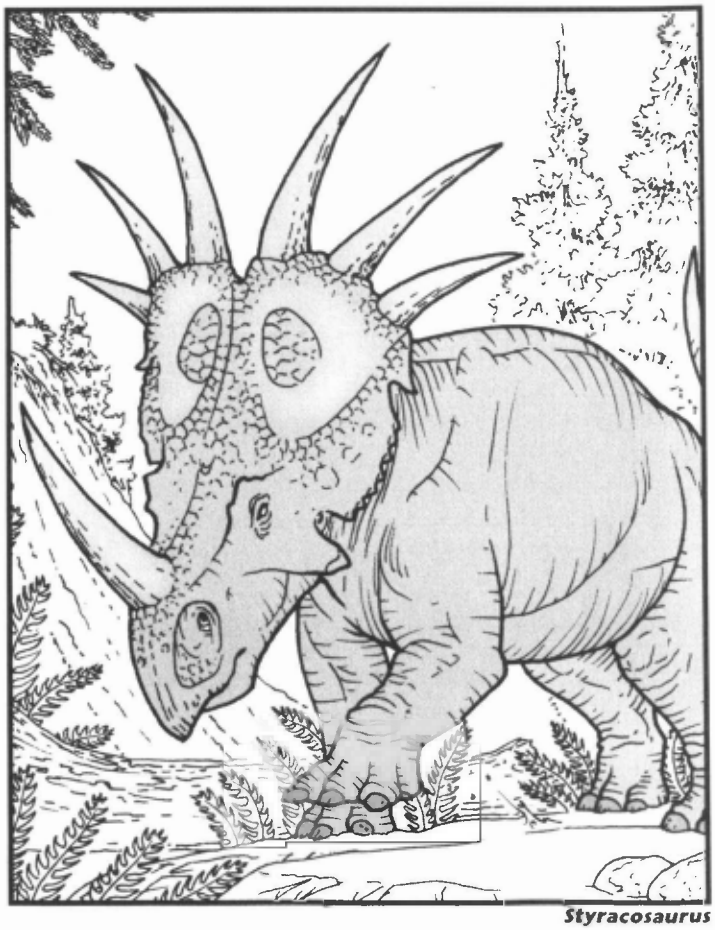
A *Styracosaurus* receives no penalty to hit when it charges, and does 4d+2 impaling damage with its nose horn. It can trample for 2d+1 crushing damage, or bite in close combat for 4d crushing damage at -4 to hit.

Torosaurus

ST: 200+ **Speed/Dodge:** 10/6 **Size:** 15+
DX: 12 **PD/DR:** 2/2# **Wt:** 5-6 tons
IQ: 3 **Damage:** 3d+2 imp#
HT: 17/50-75 **Reach:** C **Habitat:** P
Time: Late Cretaceous (70-65 mya)
Range: N. America **Discovered:** 1891

Torosaurus is one of the largest and most heavily built ceratopsians, and its wedge-shaped skull is 8½' long – the largest of any land-dwelling animal known. As with most long-frilled ceratopsians, the frill is lightened by two small "windows;" it gives the *Torosaurus'* head, neck, shoulders and upper back PD 3 and DR 6.

Like the more common and better-known *Triceratops*, *Torosaurus* has two long, forward-pointing brow horns and a much smaller nasal horn. In close combat, its head butt does 3d+2 impaling damage with either horn; it also Blocks as though its shield skill were 12. When it charges, its brow horns does 7d impaling damage, but *Torosaurus* is at -3 to hit small targets (such as humans) with this type of attack. It tramples for 3d crushing damage, or bites for 5d crushing damage at -4 to hit. *Torosaurus* may qualify for the special trampling damage rules (see p. 32).



Styracosaurus

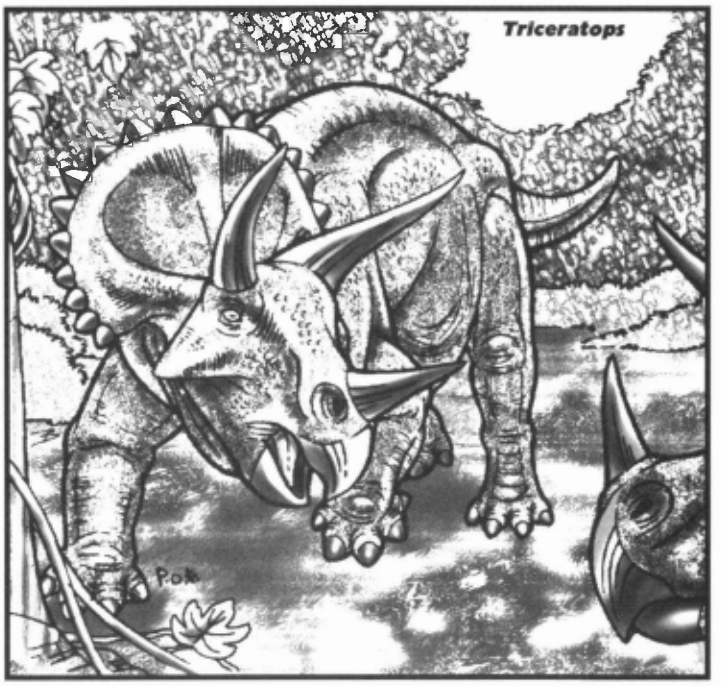
Triceratops

ST: 200+ **Speed/Dodge:** 10/6 **Size:** 15+
DX: 12 **PD/DR:** 2/2# **Wt:** 6-7 tons
IQ: 3 **Damage:** 5d imp#
HT: 17/50-75 **Reach:** C **Habitat:** P
Time: Late Cretaceous (68-65 mya)
Range: N. America **Discovered:** 1889

Largest, last and best known of the ceratopsians, *Triceratops horridus* ("rough three horn face") was the most common large herbivore in North America at the end of the Cretaceous era; more than 70% of the large dinosaur fossils from the end of the era are *Triceratops* remains. An adult *Triceratops* grows from 25' to 30' in length, with brow horns more than 3' long. Its head, neck and shoulders are protected by a solid bony frill, up to 7' wide, with PD 4 and DR 6. In close combat, its head butt does 3d+2 impaling damage with either brow horn; it also Blocks as though its shield skill were 12.

A *Triceratops* can charge at up to 25 mph, doing 7d impaling damage, but is at -3 to hit a human-sized target with this type of attack. Its trample does 3d crushing damage with no penalty to hit. Larger specimens may qualify for the special trampling damage rules (see p. 32). Unlike most ceratopsians, *Triceratops* has blade-like teeth, which shear through palm fronds and cycads and do 5d cutting damage (at -4 to hit).

With its long horns and solid shield, a *Triceratops* would be an excellent mount for an alternate-world Hannibal. It can carry up to Medium encumbrance (1 ton!) on its back, and its brow horns might be augmented with metal points, increasing damage by 1 point per die. The riders would be 7' to 10' above any infantry, out of range of any hand weapon except polearms, and the howdah could be well stocked with ranged weapons: miniguns would be ideal, but slings and bows would do.



NODOSAURS AND ANKYLOSAURS

The ceratopsians may have been the best-armed herbivores of the Mesozoic, but the nodosaurs and ankylosaurs were the best armored. Ankylosaurs were also armed with massive tail clubs, and some were festooned with spikes, making an approach from any angle hazardous. Nodosaurs lacked any method of defense apart from their armor and their ability to trample small predators, but they lived in swamps, forests and highlands where large theropods were less common. Ankylosaurs seem to have been mostly solitary creatures, and there is no evidence that they migrated.

Ankylosaurus

ST: 40-50 **Speed/Dodge:** 6/0 **Size:** 20+
DX: 11 **PD/DR:** 4/6 **Wt:** 3-6 tons
IQ: 3 **Damage:** 3d cr
HT: 15/40-45 **Reach:** 1, 2 **Habitats:** M, F, S
Time: Late Cretaceous (68-65 mya)
Range: N. America **Discovered:** 1908

Ankylosaurus ("curved lizard") is the largest of the ankylosaurs, and was the last to become extinct. It grows up to 30' long and 8' wide, standing 6' high at the hips. Like most ankylosaurs, it is not built for dodging; Dodge is 0. Its back is completely covered in bony armor plates, and even its eyelids are heavily armored.

If attacked, *Ankylosaurus* hunkers down and tries to keep its attackers behind it. The last third of its tail is reinforced, and ends in a heavily-armored shamrock-shaped club which can be swung into any back hex, or any hex adjacent to the back hex, for 3d crushing damage – enough to knock down most theropods, and large theropods find it very difficult to get up again.

Edmontonia

ST: 30-40 **Speed/Dodge:** 7/0 **Size:** 12-15
DX: 11 **PD/DR:** 3/5# **Wt:** 3-5 tons
IQ: 3 **Damage:** 2d cut#
HT: 15/30-35 **Reach:** C **Habitats:** M, F, S
Time: Late Cretaceous (76-68 mya)
Range: N. America **Discovered:** 1928

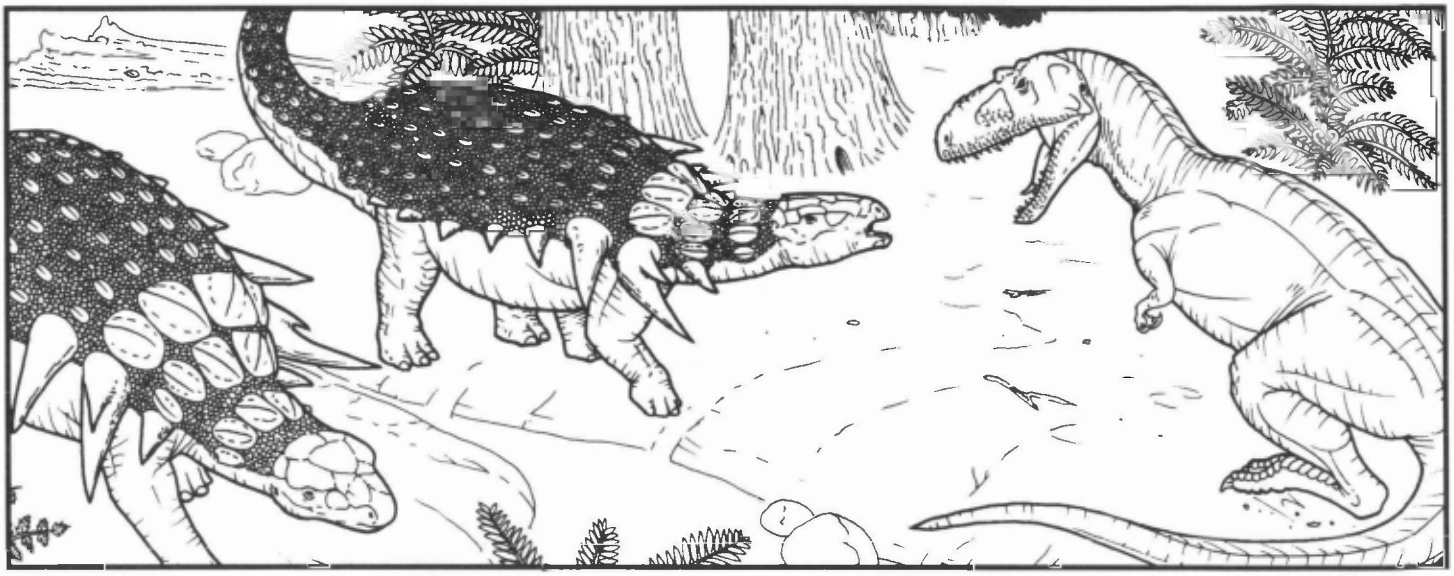
Edmontonia is a 23' long nodosaurid, with no tail club. Its back is well armored (PD 3, DR 5), and adorned with horizontal spikes near the shoulders; these do 2d cutting damage to anyone it sideswipes. *Edmontonia's* only other form of defense is to trample for 2d+1 crushing damage.

As with most nodosaurids, *Edmontonia's* legs and belly aren't armored; PD 2, DR 2.

Euoplocephalus

ST: 25-35 **Speed/Dodge:** 5/0 **Size:** 10-12
DX: 12 **PD/DR:** 3/5 **Wt:** 2-4 tons
IQ: 3 **Damage:** 2d+1 cr
HT: 15/25-30 **Reach:** 1, 2 **Habitats:** M, F, S
Time: Late Cretaceous (70-65 mya)
Range: N. America **Discovered:** 1908

Euoplocephalus ("well protected head") is a 16½' long, 6' wide ankylosaur with an enormous tail club that can inflict 2d+1 crushing damage to any target in the back hex or any hex adjacent



to the back hex. Its back, sides, head, shoulders, tail and limbs are armored with bony plates and occasional spikes (PD 3, DR 5); only its underside is unarmored (PD 2, DR 2). It is very similar to *Ankylosaurus,* and may have been its ancestor. It is also the most common North American ankylosaur.

Hylaeosaurus

ST: 20-30 **Speed/Dodge:** 6/0 **Size:** 5-7
DX: 12 **PD/DR:** 3/5# **Wt:** 2-4 tons
IQ: 3 **Damage:** 1d+1 cut#
HT: 15/20-25 **Reach:** C **Habitats:** F, S
Time: Early Cretaceous (135-119 mya)
Range: Europe **Discovered:** 1833

Hylaeosaurus is a fairly small but heavily-armored nodosaur, only 13' to 15' long and 4' high. It has seven pairs of spikes protruding horizontally from its neck, shoulders and back, a heavy bony plate over its back, and slabs of bone down its tail. Its legs and underside aren't armored (PD 2, DR 2). Its spikes do 1d+1 cutting damage to anyone it sideswipes, and it can trample for 2d crushing damage.

Minmi

ST: 15-20 **Speed/Dodge:** 7/6 **Size:** 4-5
DX: 12 **PD/DR:** 2/3# **Wt:** 700-1,500 lbs.
IQ: 3 **Damage:** 1d+1 cr
HT: 15/15-20 **Reach:** 1 **Habitats:** F, S
Time: Early Cretaceous (120-113 mya)
Range: Australia **Discovered:** 1964

Minmi is a lightly-built ankylosaur from Australia, 6' to 10' long. Its legs are longer than those of most other ankylosaurs, and it has small plates of armor on its belly as well as its back, head and tail. It was thought to be a nodosaur until a more complete skeleton, with a tail club, was found in 1992. Its tail club does 1d+1 crushing damage with a 1-hex reach.

Nodosaurus

ST: 25-35 **Speed/Dodge:** 6/0 **Size:** 7-10
DX: 12 **PD/DR:** 4/6# **Wt:** 1-4 tons
IQ: 3 **Damage:** 2d cr
HT: 15/30-40 **Reach:** - **Habitats:** M, F, S
Time: Early Cretaceous (113-98 mya)
Range: N. America **Discovered:** 1889

Nodosaurus ("lumpy lizard") is a powerfully-built 20' long herbivore with no tail club, spikes, or other forms of defense except for its armor: PD 4, DR 6 on its back and tail, PD 2, DR 3 elsewhere. It can trample for 2d crushing damage.

Pinacosaurus

ST: 20-30 **Speed/Dodge:** 7/0 **Size:** 5-7
DX: 12 **PD/DR:** 2/4 **Wt:** ½-1 ton
IQ: 3 **Damage:** 1d+2 cr#
HT: 15/20-25 **Reach:** C **Habitats:** D, P
Time: Late Cretaceous (85-81 mya)
Range: Asia **Discovered:** 1933

Pinacosaurus is a relatively slender ankylosaur, 12' to 18' long. Unlike most ankylosaurs, it lives in deserts, has an acute sense of smell (16) which helps it find food and water, and travels in family groups of 12 or more. Its tail club does 1d+2 crushing damage with a 1-hex reach.

Saichania

ST: 30-40 **Speed/Dodge:** 6/0 **Size:** 12-15
DX: 11 **PD/DR:** 3/5# **Wt:** 2-4 tons
IQ: 3 **Damage:** 2d+2 cr
HT: 15/30-35 **Reach:** 1, 2 **Habitat:** D
Time: Late Cretaceous (79-75 mya)
Range: Asia **Discovered:** 1977

Saichania (Mongolian for "beautiful") is a 23' long heavily armored ankylosaur with small spikes on its flanks. Like *Pinacosaurus,* it lives in the arid Gobi desert, and has an acute sense of smell. Its armor gives it PD 3 DR 5 on its head, back and tail; PD 2 DR 4 on its belly. Its club can be swung into any back hex, or any hex adjacent to the back hex, for 2d+2 crushing damage.

Sauropelta

ST: 25-35 **Speed/Dodge:** 6/0 **Size:** 7-10
DX: 12 **PD/DR:** 4/6# **Wt:** 1-3 tons
IQ: 3 **Damage:** 2d-1 cut
HT: 15/30-40 **Reach:** - **Habitats:** M, F, S
Time: Early Cretaceous (116-91 mya)
Range: N. America **Discovered:** 1970

Sauropelta ("shield lizard") is a fairly common 19' long nodosaurid. Its back, neck and head are well armored (PD 4, DR 6), and adorned with a horizontal spikes near the shoulders, which does 2d-1 cutting damage to anyone it sideswipes. The rest of its body is only lightly armored; PD 2, DR 2.

Tarchia

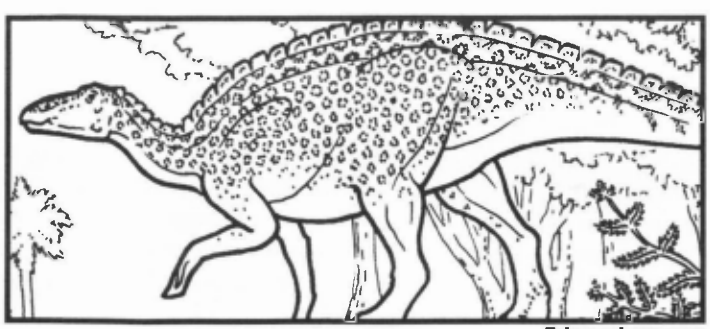
ST: 40-50 **Speed/Dodge:** 6/0 **Size:** 20+
DX: 10 **PD/DR:** 4/6 **Wt:** 3-5 tons
IQ: 3 **Damage:** 3d+1 cr
HT: 15/40-45 **Reach:** 1, 2 **Habitats:** D, P
Time: Late Cretaceous (78-69 mya)
Range: Asia **Discovered:** 1956

Tarchia gigantea is the last and largest of the Asian ankylosaurs. It grows from 18' (use *Euoplocephalus* statistics) to 29' long, and has a heavily armored back fringed with small spikes, an unusually large skull (its name is Mongolian for "brainy") with bull-like horns, and a particularly large tail club which does 3d+1 crushing damage to any predator foolish enough to come within range (back hex, or any hex adjacent to the back hex).

HADROSAURS

Hadrosaurs were the most abundant of mid-to-late Cretaceous herbivores, migrating across the plains of Asia and North America in huge herds. Though popularly known as "duckbilled dinosaurs" and often depicted as web-footed swamp-dwellers or diving animals, hadrosaurs lived on dry land. The broad "bills" of most species were hidden by jaw muscles, their crests were not usable as snorkels, their broad toes were too short for useful webs, and their tails were too rigid for swimming.

Most hadrosaurs grew from 25' to 33' long, stood about 18' high, and weighed two to three tons: the main difference between genera is in the shape of their skulls. They usually walked on four legs, but could run on two. They had little natural armor, relying on their speed and the size of their herds to protect them from predators. All had Peripheral Vision, but would have relied more on smell and hearing.



Edmontosaurus

Typical Hadrosaur

ST: 30-50 **Speed/Dodge:** 11/7 **Size:** 16-20+
DX: 14 **PD/DR:** 1/1# **Wt:** 1-2½ tons
IQ: 3 **Damage:** 2d cr
HT: 15/25-35 **Reach:** - **Habitats:** P, F

Anatotitan

ST: 40-60 **Speed/Dodge:** 12/7 **Size:** 20-25+
DX: 14 **PD/DR:** 1/1# **Wt:** 2-3 tons
IQ: 3 **Damage:** 2d-1 cr
HT: 15/30-40 **Reach:** - **Habitats:** F, P
Time: Late Cretaceous (68-65 mya)
Range: N. America

Previously known as *Trachodon* and *Anatosaurus*, *Anatotitan* ("duck giant") is a lightly-built 30' to 40' hadrosaur, up to 8' high at the hip. The front half of its broad snout is toothless, and (unlike the snouts of most "duckbilled dinosaurs") clearly resembles the bill of a duck.

Corythosaurus

Time: Late Cretaceous (76-72 mya)
Range: N. America **Habitats:** F, P
Discovered: 1914

Corythosaurus is a typical hadrosaur, growing up to 30' long. Its crested skull resembles a Corinthian helmet, hence its name. This hollow crest is connected to the nasal passages, giving it an acute sense of smell and a loud, low-pitched voice (Smell-16, Vision and Hearing-14). Adult males have larger crests than females or juveniles.

Corythosaurus' hide is dotted with small armor plates of various shapes, which give it a spotted appearance and may be more decorative than defensive. Treat it as having PD/DR of 1d-2, minimum 1.

Edmontosaurus

ST: 50-75 **Speed/Dodge:** 11/7 **Size:** 20-25+
DX: 14 **PD/DR:** 1/1# **Wt:** 3-4 tons
IQ: 3 **Damage:** 2d+1 cr
HT: 15/35-45 **Reach:** - **Habitats:** F, P
Time: Late Cretaceous (73-65 mya)
Range: N. America **Discovered:** 1917

Edmontosaurus is a large (40' long) late hadrosaur. It has no crest, but there is a low frill down the spine, along the back and tail, and its skin is studded with horny bumps (PD/DR 1d-2, minimum 1). It lives in forests, eating conifer needles and twigs.

Gryposaurus

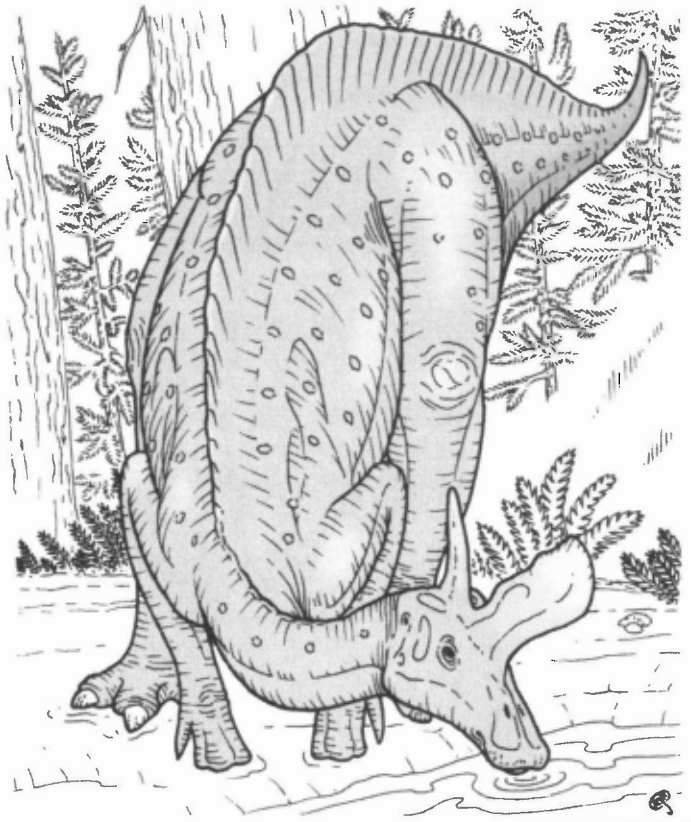
Time: Late Cretaceous (76-72 mya)
Range: N. America **Habitats:** F, P
Discovered: 1914

Gryposaurus is a typical hadrosaur, growing up to 25' long. It has no crest, but there is a bony hump on its nose which may be used in head-butting contests with rival males (1d+2 crushing damage). Its skin is smooth (PD 1, DR 1), apart from small plates on its tail.

Hadrosaurus

Time: Late Cretaceous (76-73 mya)
Range: N. America **Discovered:** 1858

Hadrosaurus, a typical hadrosaur, is known only from a headless skeleton. This was the first (almost) complete dinosaur skeleton ever found.



Lambeosaurus

Lambeosaurus

ST: 70-90	**Speed/Dodge:** 11/6	**Size:** 20-25+
DX: 13	**PD/DR:** 1/1#	**Wt:** 3-10 tons
IQ: 3	**Damage:** 3d cr (trampling)	
HT: 15/55-65	**Reach:** -	**Habitats:** F, P

Time: Late Cretaceous (76-72 mya)
Range: N. America **Discovered:** 1923

Lambeosaurus ranges in size from 30' long to giants 51' long standing 23' high: statistics above are for the largest (use typical hadrosaur statistics for smaller individuals). Its crest resembles a plow blade, with a long spike at the back; shape varied by age and sex. Its hide is randomly dotted with large bony bumps (PD/DR of 1d-3, minimum 1), and its backbone is protected with a ridge of spines up to 19" long (shorter on the neck). Smell-17, Vision and Hearing-14.

Maiasaura

Time: Late Cretaceous (77-73 mya)
Range: N. America **Habitat:** P
Discovered: 1979

Maiasaura, the "good mother lizard," is a 30' long typical hadrosaur with a small, solid crest.

Migratory *Maiasaura* herds seem to have returned to the same nesting area annually, guarded their nests, and regurgitated food to feed their young as many birds do today. John R. Horner and his team discovered the fossil remains of a herd of at least ten thousand *Maiasaura* buried by a volcanic eruption.

Parasaurolophus

Time: Late Cretaceous (76-65 mya)
Range: N. America **Habitats:** P, F
Discovered: 1922

Parasaurolophus is a 33' long typical hadrosaur with a curved crest six feet long (females have smaller, but still obvious crests), containing two hollow tubes that loop back to the nostrils. These tubes can be used as to produce low-frequency sounds as a warning (low-frequency sounds travel farther, and are harder for theropods to home in on), and also give *Parasaurolophus* an acute sense of smell (Smell-18, Vision-13, Hearing-15).

Saurolophus

Time: Late Cretaceous (72-68 mya)
Range: Asia, N. America **Habitats:** P, F
Discovered: 1912

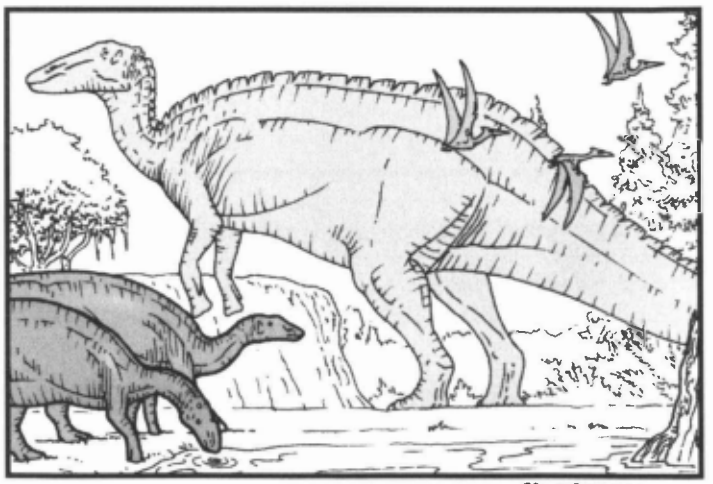
Saurolophus, probably the most common herbivorous dinosaur of late Cretaceous Asia, is a typical hadrosaurid which grows to 32' long. It has a solid, spikelike crest that protrudes backwards from its face. Its eyes are remarkably small; it is probably poor-sighted by day, and near-blind at night (Vision-10, Hearing-12, Smell-14).

Shantungosaurus

ST: 80-100	**Speed/Dodge:** 10/6	**Size:** 25+
DX: 12	**PD/DR:** 1/1#	**Wt:** 3-10 tons
IQ: 3	**Damage:** 3d cr (trampling)	
HT: 15/65-75	**Reach:** -	**Habitats:** P, F

Time: Late Cretaceous (83-73 mya)
Range: Asia **Discovered:** 1923

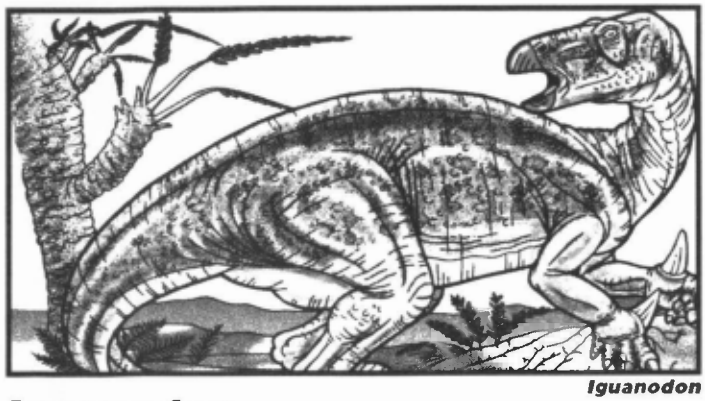
The heavily-built *Shantungosaurus giganteus* grows to at least 51' long, and is one of the largest animals ever to walk on two legs. Apart from its size, it is very similar to *Edmontosaurus* (above).



Shantungosaurus

IGUANODONTIDS

Like the hadrosaurs, iguanodontids were herbivores and are able to walk bipedally or on all fours. They are best known for their large spiked thumbs, which were used as weapons in close combat.



Iguanodon

Iguanodon

ST: 30-50 **Speed/Dodge:** 10/7 **Size:** 17-22
DX: 14 **PD/DR:** 1/2 **Wt:** 1-5 tons
IQ: 3 **Damage:** 2d+1 imp#
HT: 15/30-40 **Reach:** C, 1 **Habitats:** P, S, F, D
Time: Early Cretaceous (135-110 mya)
Range: America, Asia, Europe **Discovered:** 1822

Iguanodon, the second dinosaur ever described, was also one of the most widespread; its footprints and remains have been found in North America, Europe and Asia, from wetlands to deserts. Six species are known, with adults ranging from 20' to 33' in length: all have spiked thumbs and rather horse-like heads. On its hind legs and leaning on its tail, *Iguanodon* can stand up to 16' high; it is normally slow-moving, but can run on its hind legs at Speed 10 for short distances.

If threatened, *Iguanodon* stabs with its thumbs for 2d+1 impaling at 1-hex range, or bites for 2d+1 crushing.

Muttaburrasaurus

ST: 40-50 **Speed/Dodge:** 8/7 **Size:** 18-22
DX: 14 **PD/DR:** 1/1 **Wt:** 3-4 tons
IQ: 3 **Damage:** 2d+2 imp#
HT: 15/35-40 **Reach:** C, 1 **Habitats:** P, S
Time: Early Cretaceous (113-97 mya)
Range: Australia **Discovered:** 1963

Muttaburrasaurus is a 24' to 33' long iguanodontid with a large bump between its snout and eyes (Smell-16). Its thumb spikes are larger than those of *Iguanodon* (2d+2 impaling damage at up to 1-hex range), and its sharp-edged teeth do 2d+1 cutting damage. It may eat carrion as well as plants, and possibly even catches prey.

Ouranosaurus

ST: 30-40 **Speed/Dodge:** 9/7 **Size:** 16-20+
DX: 14 **PD/DR:** 1/1 **Wt:** 1-2 tons
IQ: 3 **Damage:** 1d+2 imp#
HT: 15/22-30 **Reach:** C **Habitats:** P, D
Time: Early Cretaceous (115-98 mya)
Range: Africa **Discovered:** 1976

Ouranosaurus is a lightly built 24' long iguanodontid. Its most distinctive feature is the large sail on its back, which may be used to radiate excess heat, as a sexual display, or to intimidate predators. *Ouranosaurus* shares Cretaceous North Africa with the sail-backed theropod *Spinosaurus,* which may take advantage of the resemblance to sneak up on *Ouranosaurus* juveniles or into nesting grounds.

Ouranosaurus' thumb spike is smaller and more delicately constructed than that of *Iguanodon*, doing 1d+2 impaling damage at 1-hex range. Its long, narrow beak does 1d+1 cutting damage.

PACHYCEPHALOSAURS

Pachycephalosaurs – literally "thick-headed reptiles" – had very thick domed skulls protecting remarkably small brains. They behaved in much the same way as modern sheep and goats – grazing on the hills and mountains in small groups, with males defending their flocks or competing for females by butting heads.

Pachycephalosaurs were bipedal, with forelimbs much smaller than their hind legs; when charging each other, they held their heads face-down, and their necks, backs and stiff tails horizontal to cushion the blow on their spines. A pachycephalosaur must make a roll against HT when it butts its opponent; if it fails, it is stunned. It takes damage only if it butts a surface with the same or higher DR and loses a Contest of ST by 10 or more points. Damage taken is equal to half the damage normally done by the animal it is butting heads with, or half the damage it normally does itself if it butts an inanimate object such as a rock or ATV. Pachycephalosaurs are probably smart enough to aim at their opponents' softer areas, rather than their heads.

Smaller pachycephalosaurids (up to 4' long) have also been found in Africa and Europe, but they were not common anywhere. Use *Homalocephale* statistics.

Goyocephale

Time: Late Cretaceous (85-80 mya)
Range: Asia **Habitat:** M
Discovered: 1982

Goyocephale ("decorated head") is a 10' long pachycephalosaur with a thick, bumpy head and remarkably large teeth for a herbivore. Use *Stegoceras* statistics.

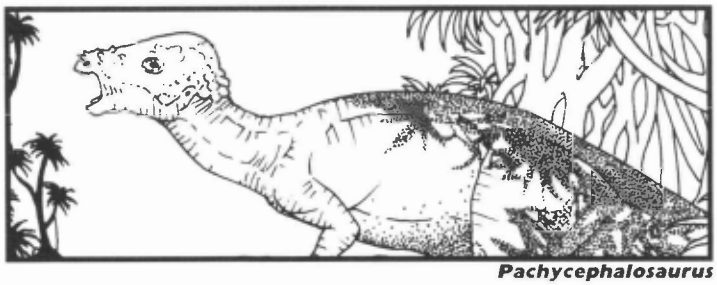
Ouranosaurus

Homalocephale

ST: 9-12 **Speed/Dodge:** 10/7 **Size:** 1-2
DX: 15 **PD/DR:** 0/1# **Wt:** 70-100 lbs.
IQ: 3 **Damage:** 2d-2 cr
HT: 9-10 **Reach:** C **Habitat:** M
Time: Late Cretaceous (80-70 mya)
Range: Asia **Discovered:** 1974

Homalocephale ("flat-head") grows to 5' long, with a 5½" wide skull housing a tiny brain. Its charge does 2d-2 crushing damage, with no penalty to hit a human-sized target, and will probably connect in Location 11-14. Such an attack might cripple a small predator's leg, leaving it helpless.

Homalocephale's skull has PD 2, DR 3; the rest of its body is PD 0, DR 1.



Pachycephalosaurus

Pachycephalosaurus

ST: 25-30 **Speed/Dodge:** 10/5 **Size:** 5-8
DX: 11 **PD/DR:** 1/1# **Wt:** 1,000-1,500 lbs.
IQ: 3 **Damage:** 4d cr#
HT: 13/30-35 **Reach:** C **Habitat:** M
Time: Late Cretaceous (68-65 mya)
Range: N. America **Discovered:** 1931

The 15' long *Pachycephalosaurus* is the largest of the boneheads. Its skull is 2' long, fringed with small bony spikes and topped with a dome of 8" thick solid bone. *Pachycephalosaurus'* braincase has PD 4, DR 8; elsewhere, its hide gives it PD 1, DR 1.

Pachycephalosaurus attacks by charging, doing 4d crushing damage. Because it has to lower its head to charge, it is at -3 to hit a human-sized target, and -5 to hit something as small as another *Pachycephalosaurus'* head. A six-foot human would probably be hit in Location 9 or 10.

In close combat, *Pachycephalosaurus'* head butt does 2d crushing damage; it is -1 to Dodge, and -3 to block, and cannot be parried. It can also trample for 1d+1 crushing damage.

Prenocephale

ST: 13-16 **Speed/Dodge:** 10/6 **Size:** 2-3
DX: 12 **PD/DR:** 1/1# **Wt:** 100-200 lbs.
IQ: 3 **Damage:** 2d+2 cr#
HT: 13/12-14 **Reach:** C **Habitat:** M
Time: Late Cretaceous (77-69 mya)
Range: Asia **Discovered:** 1974

Prenocephale ("face downwards head") is a 7' long bonehead with a thick skull (PD 3, DR 5) and very large, forward-facing eyes (Vision-16). Its charge does 2d+2 crushing damage, with no penalty to hit a human-sized target, and would probably connect in Location 11-14. In close combat, its head-butt does 1d+1 crushing damage.

Stegoceras

ST: 14-17 **Speed/Dodge:** 10/6 **Size:** 3-4
DX: 12 **PD/DR:** 1/1# **Wt:** 80-120 lbs.
IQ: 3 **Damage:** 2d+2 cr#
HT: 13/12-14 **Reach:** C **Habitat:** M
Time: Late Cretaceous (76-65 mya)
Range: N. America **Discovered:** 1918

Stegoceras, one of the best known boneheads, reaches 6½' long. Its charge does 2d+2 crushing damage, with no penalty to hit a human-sized target, and will probably connect in Location 10-11. In close combat, its head-butt does 1d+1 crushing damage; it can also bite for 1d crushing damage.

Stegoceras' thick skull has PD 3, DR 4; the rest of its body is PD 1, DR 1.

Stygimoloch

ST: 14-17 **Speed/Dodge:** 10/6 **Size:** 2-3
DX: 12 **PD/DR:** 1/1# **Wt:** 100-200 lbs.
IQ: 3 **Damage:** 2d+2 imp#
HT: 13/12-14 **Reach:** C **Habitat:** M
Time: Late Cretaceous (68-65 mya)
Range: N. America **Discovered:** 1983

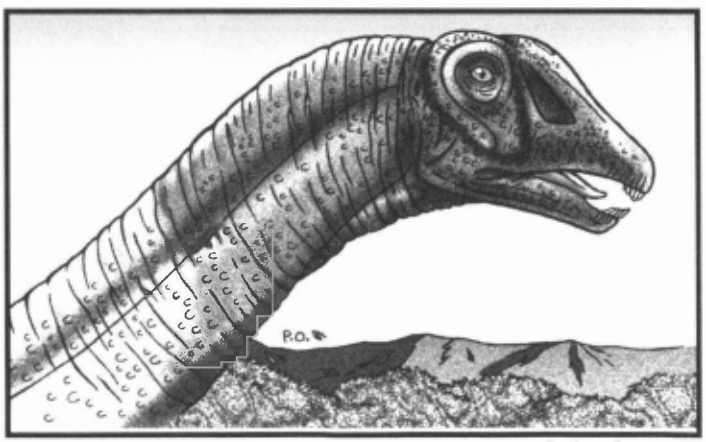
The 7' long *Stygimoloch* (named after the River Styx and the demon Moloch) is a bonehead with branching 4" horns and smaller spikes crowning its head. These do 2d+2 impaling damage in a charge, with no penalty to hit a human-sized target, and would probably connect in Location 11-14. In close combat, it gores for 1d+1 impaling damage.

SAUROPODS

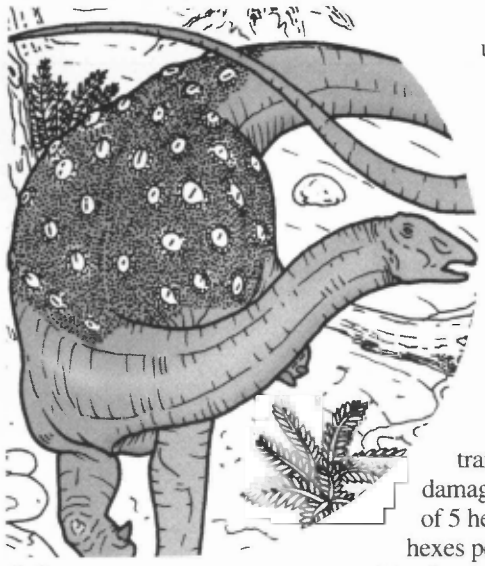
Many Cretaceous sauropods – though not all – were *titanosaurs*, a group with armor plating over parts of their bodies. All are too large to get a Dodge roll, except for their heads, which Dodge at 4.

Alamosaurus

ST: 300+ **Speed/Dodge:** 5/0# **Size:** 30-40+
DX: 9 **PD/DR:** 2/3# **Wt:** 10-30 tons
IQ: 3 **Damage:** 4d-2 cr
HT: 17/100 **Reach:** 1-5 **Habitats:** F, P
Time: Late Cretaceous (73-65 mya)
Range: N. America **Discovered:** 1922



Antarctosaurus



Saltasaurus

Alamosaurus grows up to 70' long, and is very much like *Apatosaurus* in its build, though with a shorter tail. Rearing up on its massive hind legs, it can reach 50' up into the trees. It travels in small herds or family groups. *Alamosaurus'* bulk enables it to trample for 6d crushing damage. Its tail has a reach of 5 hexes and can swing 5 hexes per turn (movement is measured by the tip of the tail). The tail automatically hits anything more than 5' tall; anyone within the affected area must make a Dodge roll to avoid being hit for 4d-2 crushing damage. Assess knockback as from a slam: fallen predators can then be trampled. *Alamosaurus* would qualify for the special trampling damage rules (see p. 32).

No armor plates have been found with *Alamosaurus* fossils; if it has them, its DR on its sides is 1d-1 (minimum 3); elsewhere, DR is 3.

Amargasaurus

ST: 180+ **Speed/Dodge:** 5/0 **Size:** 20+
DX: 9 **PD/DR:** 2/2 **Wt:** 6-8 tons
IQ: 3 **Damage:** 2d cr*
HT: 16/60 **Reach:** 1-5 **Habitats:** P, F
Time: Early Cretaceous (131-125 mya)
Range: S. America

Amargasaurus is a 33' long diplodocid, similar to *Dicraeosaurus* in appearance except for having two rows of tall spines along its neck, back and tail. These spines may support two parallel sails, smaller than but otherwise similar to that of *Spinosaurus*, making it one of the most bizarre-looking of dinosaurs. Use *Dicraeosaurus* statistics (p. 33).

Argentinosaurus

ST: 400+ **Speed/Dodge:** 5/0# **Size:** 70+
DX: 10 **PD/DR:** 2/3# **Wt:** 50-70 tons
IQ: 3 **Damage:** 7d cr
HT: 17/150-200 **Reach:** - **Habitats:** F, P
Time: Late Cretaceous (83-65 mya)
Range: S. America **Discovered:** 1916

Argentinosaurus is a 100' long titanosaur, with the short tail of a brachiosaur, the long hind legs and arched back of a diplodocid, and a much longer and wider torso and gut than most sauropods. Its only form of attack is to trample for 5d crushing damage, and would qualify for the special trampling damage rules (see p. 32). If it is armored, the DR on its sides is 1d (minimum 3); elsewhere, DR is 3. It is widespread through South America during the late Cretaceous.

Hypselosaurus

ST: 30-50 **Speed/Dodge:** 5/5 **Size:** 4-10
DX: 10 **PD/DR:** 1/1# **Wt:** 6-10 tons
IQ: 3 **Damage:** 2d-2 cr
HT: 15/25-40 **Reach:** - **Habitats:** F, P
Time: Late Cretaceous (73-65 mya)
Range: Europe **Discovered:** 1869

Hypselosaurus is a fairly small titanosaur, 27' to 35' long. It can trample for 2d crushing damage, but has no other form of attack. DR on its back and sides is 1-4 (1d-2, minimum 1); elsewhere, DR is 1. *Hypselosaurus* is best known for its half-gallon eggs, which are 1' long and 10" wide, and usually laid in clusters of five.

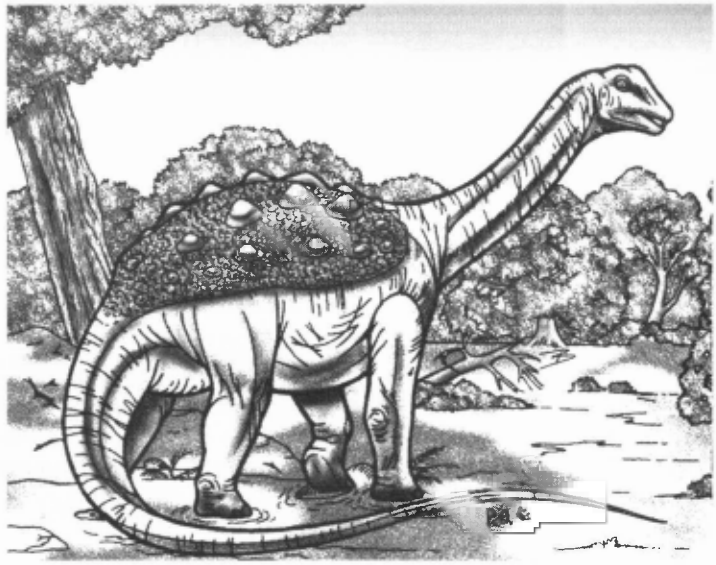
Saltasaurus

ST: 40-50 **Speed/Dodge:** 5/0 **Size:** 10-14
DX: 10 **PD/DR:** 1/1# **Wt:** 10-12 tons
IQ: 3 **Damage:** 2d cr
HT: 15/35-45 **Reach:** 1-4 **Habitats:** F, P
Time: Late Cretaceous (83-65 mya)
Range: S. America **Discovered:** 1893

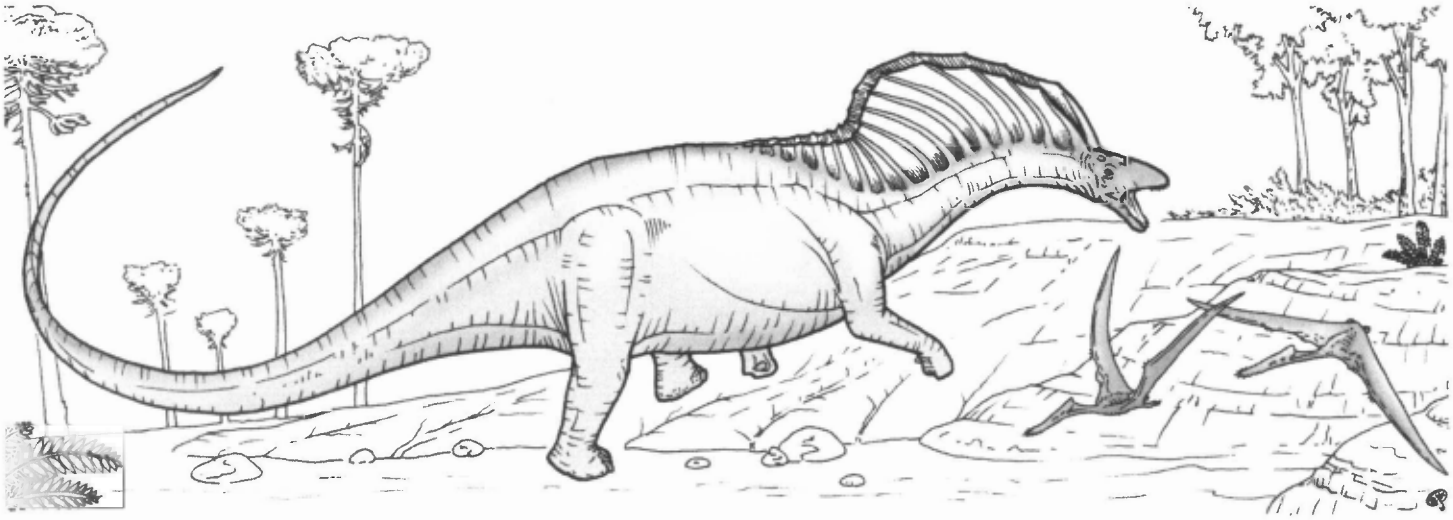
Saltasaurus is a lightly-built and lightly-armored titanosaur, 40' long. Its back and sides are covered with small bumps of bone and occasional 4" plates, which give it a spotted appearance. Treat it as having a PD of 2 and a DR of 1d-1 (minimum 1) on its back and sides; PD 1, DR 1 elsewhere. Its tail-whip does 2d crushing damage with a four-hex reach; it can also trample for 2d crushing damage. By rearing up on its hind legs and balancing itself with its tail, it can reach branches more than 20 feet from the ground.

Titanosaurus

ST: 220+ **Speed/Dodge:** 6/0 **Size:** 25+
DX: 10 **PD/DR:** 2/2# **Wt:** 10-12 tons
IQ: 3 **Damage:** 4d cr
HT: 17/70 **Reach:** - **Habitats:** F, P
Time: Late Cretaceous (83-65 mya)
Range: Africa, Asia, Europe, India, S. America
Discovered: 1877



Titanosaurus



Amargasaurus

Titanosaurus is a heavily built 40' long sauropod with a lightly armored back. Treat it as having a PD of 2 and a DR of 1d-1 (minimum 2) on its back and sides; PD 2, DR 2 elsewhere. It can trample for 4d crushing damage, has no other form of attack, and would qualify for the special trampling damage rules (see p. 32).

HYPSILOPHODONTS

Hypsilophodonts are small, bipedal herbivores, which depend on their running speed for protection. They ranged worldwide through the Cretaceous and late Jurassic.

Hypsilophodon

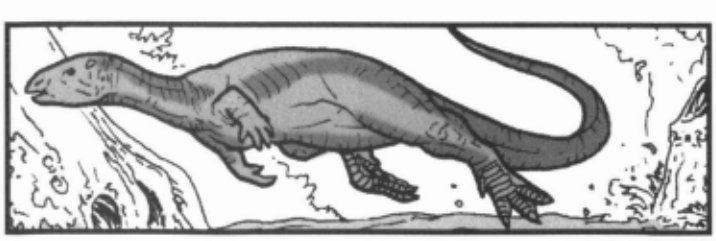
ST: 9-12 **Speed/Dodge:** 13/7 **Size:** 1-2
DX: 15 **PD/DR:** 0/1 **Wt:** 80-100 lbs.
IQ: 3-4 **Damage:** 1d-1 cr
HT: 10-11 **Reach:** C, 1 **Habitats:** P, F
Time: Early Cretaceous (125-115 mya)
Range: Europe, N. America **Discovered:** 1869

Hypsilophodon is a small, lightly-built biped, growing up to 7½' long and 2' high at the hips. Faster than most theropods, it would probably run if threatened, but can bite for 1d-1 crushing.

Leaellynasaura

Time: Early Cretaceous (115-110 mya)
Range: Australia **Habitats:** P, A
Discovered: 1989

Leaellynasaura grows up to 10' long, with enormous eyes (Vision-16, Night Vision) and a large brain – for a herbivorous dinosaur, at least. It lived below the Antarctic circle, where it was dark for three months each year. Use *Hypsilophodon* statistics.



Hypsilophodon

Orodromeus

Time: Late Cretaceous (77-73 mya)
Range: N. America **Habitats:** F, S
Discovered: 1988

Orodromeus grows up to 8' long, and may eat insects as well as plants. *Orodromeus* nests in colonies, like modern penguins, and lays 6" eggs in clutches of 12, hidden in underbrush. Use *Hypsilophodon* statistics.

OTHER HERBIVORES

Camptosaurus see p. 36

Wuerhosaurus

ST: 40-60 **Speed/Dodge:** 4/4 **Size:** 10
DX: 10 **PD/DR:** 2/4 **Wt:** 2-3 tons
IQ: 3 **Damage:** 4d-2 imp#
HT: 15/40-50 **Reach:** 1, 2 **Habitats:** P, F, S
Time: Early Cretaceous (138 to 125 mya)
Range: China **Discovered:** 1973

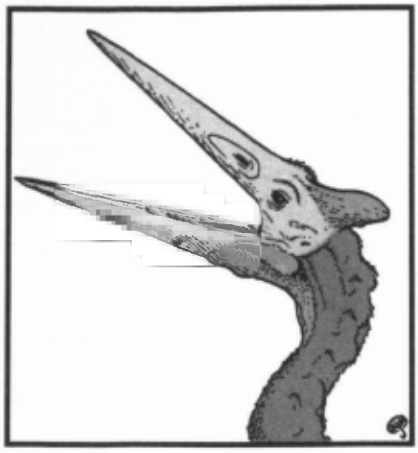
Wuerhosaurus is a 26' long stegosaur, standing about 7' high at the tip of the highest plate. Its back is protected by two rows of triangular plates, which become spikes above the hips and down along the tail. On a roll of 12 or less (modified for the opponent's size), all four tail spikes hit for 4d-2 damage; on a 13-14, 2 spikes for 2d-1; on a 14, one for 1d. Anything in any back hex, or hex adjacent to the back hexes, may be hit.

Tenontosaurus

ST: 30-40 **Speed/Dodge:** 9/7 **Size:** 16-20+
DX: 14 **PD/DR:** 1/1 **Wt:** 1,500-2,000 lbs.
IQ: 3 **Damage:** 1d+2 cr
HT: 15/22-30 **Reach:** C **Habitat:** S
Time: Early Cretaceous (116 mya-113 mya)
Range: N. America **Discovered:** 1970

Tenontosaurus is a 23' long herbivore, with more than half of that length being a semi-rigid tail. Its forelimbs are relatively long and powerful, enabling to walk bipedally or on all fours, and its head resembles that of an *Iguanodon*. It lives in swamps, and is a favorite prey of packs of *Deinonychus*.

Pterosaurs and Birds



Like many other archosaur families, pterosaurs grew to their greatest size towards the end of the Cretaceous – the most famous of these being *Quetzalcoatlus*, which may have had a wingspan of more than 50 feet. Most of the pterosaurs known from this time were still shore-dwelling fish-eaters, but similar species may have lived inland, hunting small vertebrates. Most species lacked tails, and many also saved weight by having no teeth (though the best-known birds from this time, the tern-like *Ichthyornis* and the small-winged diver *Hesperornis*, had quite impressive teeth; they died out towards the end of the era).

There may also have been small pterosaurs adapted to eating the parasites that plagued the dinosaurs (as modern tick-birds do for herbivores). These pterosaurs needed long thin beaks, for probing into wounds and between teeth; an angry swarm would do 1d-1 impaling damage per turn, have a Move of 8, and take six hits per hex to disperse.

All pterosaurs had Vision-16 (other senses at 12), and many were probably brightly colored, like modern birds.

Most types of modern birds had appeared by the end of the Cretaceous, including waterfowl, woodpeckers, kingfishers, owls, cranes, shorebirds, raptors (birds of prey), ratites (flightless birds), vultures, pelicans and flamingos.

Cearadactylus

ST: 4-6 **Speed/Dodge:** 14/7# **Size:** 6
DX: 14 **PD/DR:** 0/0 **Wt:** 25-50 lbs.
IQ: 3 **Damage:** 1d-2 imp
HT: 14/10-25 **Reach:** C **Habitat:** SW#
Time: Middle Cretaceous (125-100 mya)
Range: S. America **Discovered:** 1985

Cearadactylus atrox has an 18' wingspan and a 2' skull bristling with long, sharp front teeth. These are used for spearing fish, but can give a powerful bite (1d-2 impaling) to predators or time travelers. Like most pterosaurs, they live near sea coasts.

Criorhynchus

ST: 4-6 **Speed/Dodge:** 14/7# **Size:** 5-6
DX: 14 **PD/DR:** 0/0 **Wt:** 20-40 lbs.
IQ: 3 **Damage:** 1d-3 cut
HT: 14/10-25 **Reach:** C **Habitat:** SW#
Time: Early – Late Cretaceous (141-89 mya)
Range: Europe **Discovered:** 1919

Criorhynchus ("ram-snout") has a 16' to 18' wingspan and a 20" skull. Its bill is spoon-shaped, with small and widely-spaced teeth that do 1d-3 cutting damage. They live near beaches, and eat mostly fish.

Dsungaripterus

ST: 4-6 **Speed/Dodge:** 12/6# **Size:** 1-3
DX: 13 **PD/DR:** 0/0 **Wt:** 15-30 lbs.
IQ: 3 **Damage:** 1d-3 imp
HT: 14/4-6 **Reach:** C **Habitat:** #
Time: Early – Middle Cretaceous (155-110 mya)
Range: Africa, Asia, S. America **Discovered:** 1973

Dsungaripterus has a wingspan of 10' and a 17" skull with small crests. Its beak is curved, with a sharp tip, and blunt teeth used for cracking shellfish. If threatened, or disturbed in its nest, it pecks for 1d-3 impaling damage. It lives near large lakes and seas.

Pteranodon

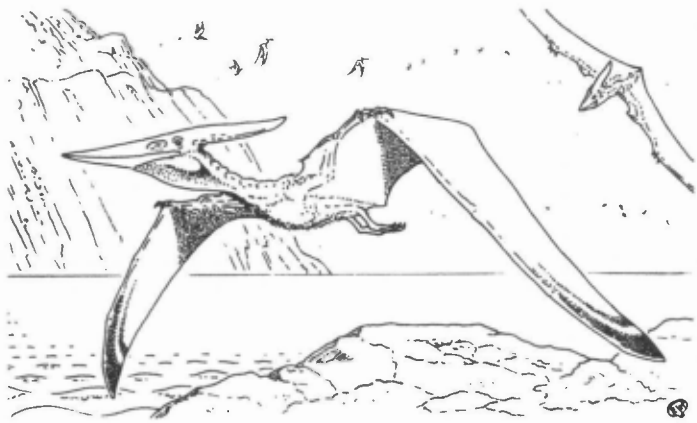
ST: 3-6 **Speed/Dodge:** 14/7# **Size:** 4-6
DX: 14 **PD/DR:** 0/0 **Wt:** 30-50 lbs.
IQ: 3 **Damage:** 1d-1 cr
HT: 14/10-25 **Reach:** C **Habitat:** SW#
Time: Early – Middle Cretaceous (213-194 mya)
Range: America **Discovered:** 1871

Pteranodons ("winged and toothless") have wingspans of up to 30'. They have huge, rudderlike crests on their skulls, which reach up to 6' long. They are very lightly built, and lack tails and teeth.

Pteranodons may be encountered over a hundred miles out to sea, soaring like albatross and catching fish near the surface.

Pterodaustro

ST: 3-4 **Speed/Dodge:** 10/7# **Size:** 1-2
DX: 14 **PD/DR:** 0/0 **Wt:** 3-10 lbs.
IQ: 3 **Damage:** -
HT: 14/2-3 **Reach:** - **Habitats:** SW, S#
Time: Early Cretaceous (147-130 mya)
Range: S. America **Discovered:** 1970



Pteranodon

Pterodaustro is one of the strangest-looking pterosaurs known. It has a 4' wingspan and a 9" skull. Its long, curved beak is lined with hundreds of bristly teeth, so that it resembles a brush and acts like a sieve. It feeds on small crustaceans in shallow waters. It would be reasonable for GMs to describe it as bright pink, assuming that it absorbs the pigments from its food as modern flamingos do.

Quetzalcoatlus

ST: 7-9 **Speed/Dodge:** 12/7# **Size:** 15#
DX: 14 **PD/DR:** 0/0 **Wt:** 50-190 lbs.
IQ: 3 **Damage:** 1d cut
HT: 11-13 **Reach:** C, 1 **Habitats:** P, F, S
Time: Late Cretaceous (75-65 mya)
Range: N. America **Discovered:** 1971

Quetzalcoatlus northropi (named after an Aztec god and an aircraft company) is the largest flying creature ever discovered. It has a wingspan of 40' to 50', larger than some light aircraft, and soars and glides over great distances in search of food. B-movies to the contrary, it is not strong enough to carry Raquel Welch, or any other adult human.

Unlike most pterosaurs, *Quetzalcoatlus* lives hundreds of miles from the sea-coast. It is probably a scavenger, using its long, narrow, toothless beak and long, flexible neck for reaching into bodies (like the marabou stork of Africa). It may also eat small prey that it could kill with a single crunch.

Quetzalcoatlus may have been the last of the pterosaurs: it survived until the end of the Cretaceous, keeping company with the very large *T. rex* and *Triceratops*. It is ungainly on the ground; Move 1, Dodge 5, Size 1.

Remains of long-necked Cretaceous pterosaurs, similar to *Quetzalcoatlus* in size and appearance, have been found in Russia and Senegal (*Azhdarcho,* named after a dragon from Russian legend; 105-88 mya) and Jordan (*Arambourgiania,* formerly known as *Titanopteryx*, "titanic wing," 94-85 mya).

The Cretaceous Oceans

Marine reptiles thrived until the end of the Cretaceous, often reaching enormous size. Mosasaurs, plesiosaurs and pliosaurs dominated the seas, though larger sharks were taking over the niche of the ichthyosaurs.

Archelon

ST: 30-40 **Speed/Dodge:** 10/5 **Size:** 7-8
DX: 10 **PD/DR:** 2/4# **Wt:** 1-5 tons
IQ: 3 **Damage:** 1d+2 cr
HT: 16/30-40 **Reach:** C **Habitat:** SW
Time: Late Cretaceous (80-65 mya)
Range: America **Discovered:** 1896

Archelon ("ruling turtle") is a sea turtle, similar to the modern leatherback, but reaching up to 15 feet in length. Its shell is covered with thick, rubbery skin, rather than hard horn, giving it PD 2, DR 4 on its back and belly. Its head has PD 2, DR 2; its powerful flippers, PD 1, DR 1. Impressive as *Archelon* looks, it is relatively inoffensive; it uses its beak to crush the huge clams of the Cretaceous ocean, and may vary its diet with octopi and jellyfish. If attacked, it could do 2d crushing damage in close combat..

If necessary, *Archelon* can be ridden, in much the same manner as an TL8 aquasled; its shell provides adequate handholds, a single human would not encumber it, and it doesn't have a long enough neck to attack something on its own back. Steering, however, would require a contest of ST or some equivalent of a carrot on a stick. Riding (*Archelon*) defaults to Swimming or Riding (other marine animal) at -3.

Elasmosaurus

ST: 20-30 **Speed/Dodge:** 7/7 **Size:** 10-16
DX: 14 **PD/DR:** 1/1 **Wt:** 1-2 tons
IQ: 3 **Damage:** 1d+1 imp
HT: 14/15-25 **Reach:** 1-8 **Habitat:** SW
Time: Late Cretaceous (80-65 mya)
Range: Asia, N. America **Discovered:** 1868

Elasmosaurus is the plesiosaur taken to (or beyond) its logical extreme – a 46' long reptile with a 26' long neck. The neck contains 71 vertebrae, making it flexible enough to wrap around its own body.

Elasmosaurus swims near the surface of the ocean, with its neck held high, looking down on the water and snapping up prey – fish, squid and ammonites – that come within its 8-hex range. It won't attempt to pluck an adult human from a boat – it isn't that strong, nor is its head or neck wide enough to swallow man-sized prey – but it might well mistake a man in a boat for a rival, and attack, biting for 1d+1 impaling damage.

Ichthyosaurus see p. 39

Kronosaurus

ST: 70-90 **Speed/Dodge:** 14/7 **Size:** 20-28
DX: 9 **PD/DR:** 2/3 **Wt:** 15-20 tons
IQ: 3 **Damage:** 5d imp
HT: 15/50-80 **Reach:** C, 1, 2 **Habitat:** SW
Time: Early Cretaceous (115-90 mya)
Range: Australia **Discovered:** 1924

The 42' long pliosaur *Kronosaurus queenslandicus* is perhaps the most formidable marine reptile ever discovered. Its

skull alone is 9' long, twice as large as that of *Tyrannosaurus rex,* and filled with 10" teeth. It can bite for 5d impaling damage with a 2-hex reach.

Like *Liopleurodon* (p. 39), *Kronosaurus* has a short, thick neck, a streamlined body, and extremely efficient flippers, enabling it to chase fast-moving prey – mostly fish, squid and ammonites, but also smaller ichthyosaurs and plesiosaurs. It lives in the warm, shallow inland seas that covered much of Cretaceous Australia.

MOSASAURS

Mosasaurs are not dinosaurs, but true lizards, closely related to modern varanids such as the Komodo dragon. They are more snakelike than most ichthyosaurs, with long tails and smaller fins; they swim by undulating their entire bodies, using their small flippers for steering.

Platecarpus

ST: 25-35 **Speed/Dodge:** 13/6 **Size:** 4-5
DX: 13 **PD/DR:** 1/1 **Wt:** 1,000-1,500 lbs.
IQ: 3 **Damage:** 2d-1 imp
HT: 14/12-25 **Reach:** C **Habitat:** SW
Time: Late Cretaceous (80-65 mya)
Range: Europe, N. America

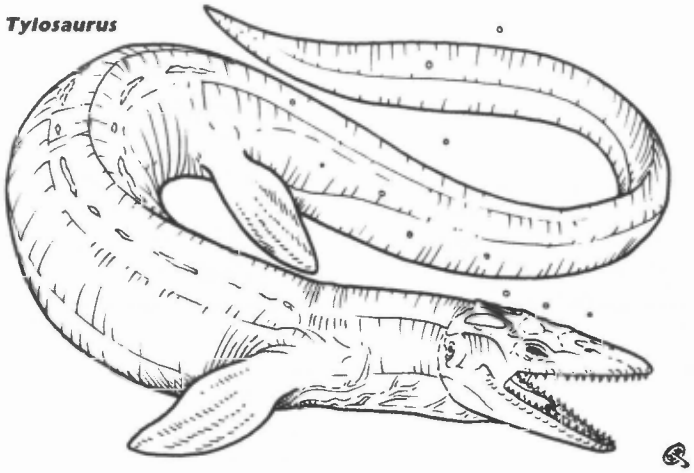
Platecarpus is a fairly common 14' mosasaur. Its jaws are long, and its teeth sharp, enabling it to bite for 2d-1 impaling. It lives in shallow waters, preying on ammonites and fish.

Tylosaurus

ST: 40-60 **Speed/Dodge:** 12/6 **Size:** 7-10
DX: 10 **PD/DR:** 1/2* **Wt:** 3-6 tons
IQ: 3 **Damage:** 4d-1 imp
HT: 15/30-45 **Reach:** C, 1 **Habitat:** SW
Time: Late Cretaceous (80-65 mya)
Range: North America, New Zealand

Tylosaurus is a very large mosasaur, growing to 29' long with a huge skull. It bites for 4d-1 impaling damage, at up to 1-hex range, and eats ammonites and large vertebrates - including small plesiosaurs, sharks, and other large fish. Like a snake, it can dislocate its lower jaw to swallow prey weighing as much as 800 lbs. Bony plates protect the top of its head, giving it PD 2, DR 3. Elsewhere, it is covered with large scales (PD 1, DR 2).

Tylosaurus



DINOSAUR INTELLIGENCE

Even staunch dinosaur-lovers have to admit that most dinosaurs were stupid, compared to many modern animals. Not all were as small-brained as the pin-headed herbivores of the Jurassic, the sauropods and stegosaurs, but very few had a higher brain-mass-to-body-mass ratio than modern crocodiles – hardly intellectual giants. Even the dinosaurs with the largest brains for their body size, *Saurornitholestes* and *Troodon,* were probably no smarter than intelligent birds.

In a "lost realm," of course, dinosaurs would have had an extra 65 million years to develop larger brains and more intelligence. Whether or not they would have done so is debatable. While the brains of birds and mammals have grown enormously over the eons – most modern birds have brains twice as large as their Cretaceous counterparts, and modern cats are twice as brainy as the sabertooths of only 30 million years ago – the brain-mass-to-body-mass ratio of reptiles has not increased in 300 million years. There is no evidence that intelligence is an inevitable, or even likely, end-product of evolution – or even, in the long run, much of a survival trait – but as dinosaur bodies evolved fairly quickly (the average life of a species is four million years), 65 million years might be enough to produce dinosaurs as smart as cats, apes or dolphins . . . or possibly even smarter than humans.

Whether or not intelligent dinosaurs would have become tool-makers is debatable; chimps and humans invented tools because they lacked natural weaponry, and the same can hardly be said for *Troodon,* much less *Tyrannosaurus.*

Dinosaurs as PCs

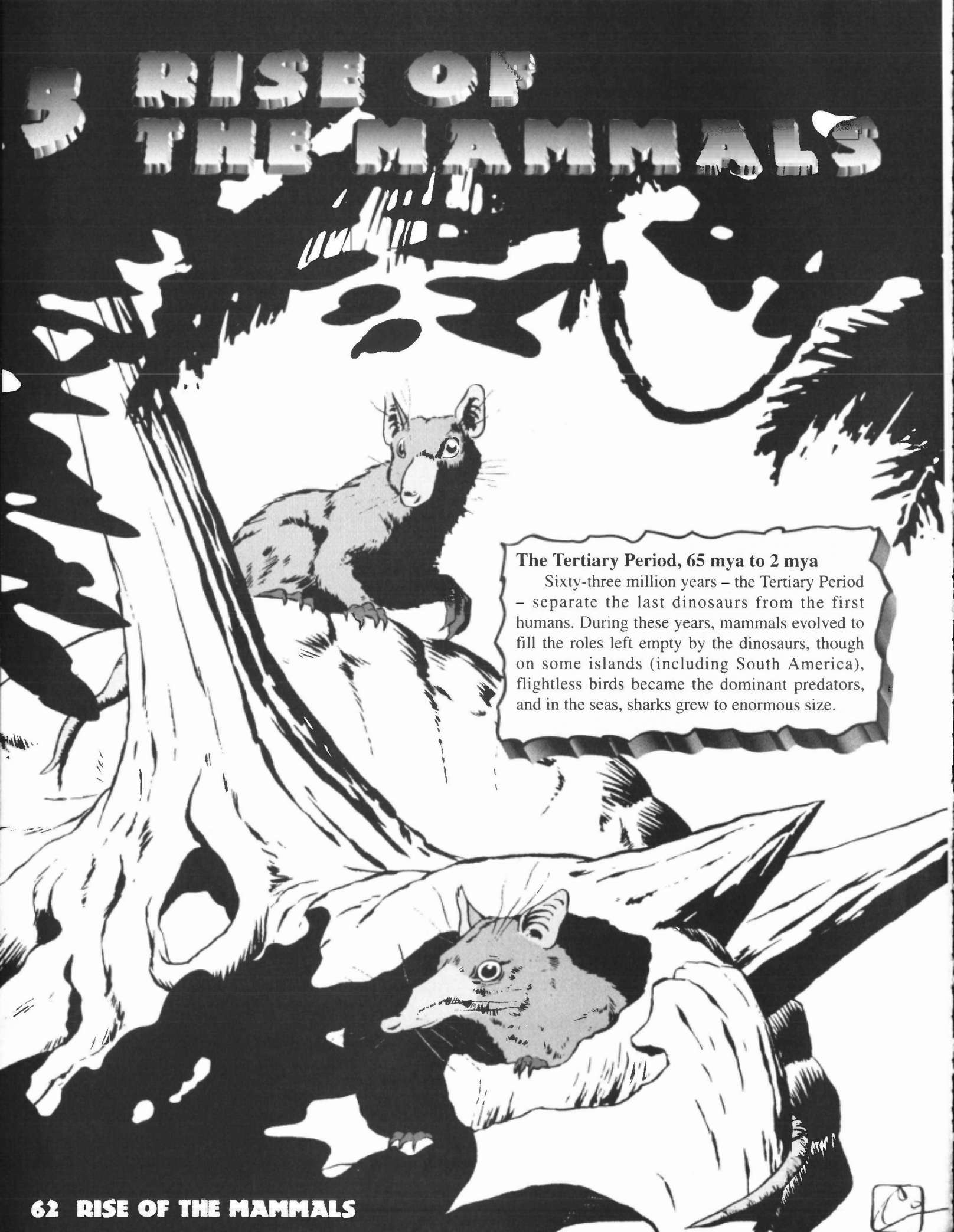
Because of their low IQs, dinosaur PCs may seem better suited to the slapstick style of ***Toon*** than to ***GURPS*** . . . but this is not an insurmountable obstacle.

In a "lost realm" campaign, of course, dinosaurs can be as smart as the GM allows. Intelligent reptiles from fiction include the Yilane, descended from marine tylosaurs, from Harry Harrison's *Eden* series; the Mahar, evolved from pterosaurs, in Edgar Rice Burroughs' *At the Earth's Core*; the Silurians, from *Doctor Who*; and the Quintaglio, five-fingered dwarf tyrannosaurs with artificially-boosted intelligence, from Robert Sawyer's *Quintaglio* series.

A dinosaur with human intelligence would be suitable for a ***Supers*** campaign. ***GURPS Wild Cards*** gives the statistics for Kid Dinosaur, able to transform into a *Deinonychus* or *Quetzalcoatlus*. A 500-point *Tyrannosaurus*-man would need Transformation, Growth (Maximum size only), Enhanced ST, Damage Resistance, Extra Hit Points, Discriminatory Smell, Super Running, Talons, and Short Arms (-10; can still use handguns). Appropriate disadvantages would include Appearance (Unattractive to Hideous) and a reaction penalty (bad breath). Breathing fire (Flame Jet) is an optional extra; being purple and singing to children should be considered an Odious Personal Habit.

Psionics (Telecontrol), Magic (Shapeshift or Rider Within) and the Mental Projection method of time travel can also be used as an excuse to play dinosaurs with human intelligence.

3 RISE OF THE MAMMALS



The Tertiary Period, 65 mya to 2 mya

Sixty-three million years – the Tertiary Period – separate the last dinosaurs from the first humans. During these years, mammals evolved to fill the roles left empty by the dinosaurs, though on some islands (including South America), flightless birds became the dominant predators, and in the seas, sharks grew to enormous size.

The Paleocene, the first epoch of the Tertiary, was warmer and more humid than our own time, though cooler than the Cretaceous. Common plants included ferns, palms, conifers, oaks, elms, magnolias and sycamores, and the first grasses appeared. Few mammals grew larger than modern sheep until the next epoch, the Eocene, when giants such as *Andrewsarchus*, *Diatryma* and *Uintatherium* appeared. Bats were common, and reptiles and amphibians surprisingly rare, despite the tropical climate.

Most modern mammal groups had appeared by the Oligocene, replacing many of the Eocene species. The climate was dryer than in the Eocene, with forests dwindling and arid grasslands spreading across much of the world, and camouflage became less useful than speed.

The Miocene was a time of volcanic eruptions and upheavals, as the continents came closer to their present positions. Africa collided with Europe, forming the Alps, Carpathians and Atlas mountains. Volcanic eruptions gave rise to the Hawaiian islands and the Andes. Japan split from China, Baja from Mexico, and Africa from Arabia. Ice caps formed on both poles, but the weather in Europe and North America remained wet and warm.

Most of the animals described in this chapter became extinct before human beings appeared . . . but they will be of interest to time travelers, and a potential problem in lost realms.

Paleontologists as PCs

In any adventure involving modern man and prehistoric animals, a paleontologist is as essential as a high-powered rifle and Climbing skill. Fortunately, most paleontologists who have done fieldwork are used to living off the land, and have a variety of other useful abilities. They are also likely to venture into poorly-explored and dangerous territory in search of fossils, and may be given access to areas off limits to most people – an excellent cover for spies. Paleontologists make particularly suitable characters for ***Old West*** and ***Cliffhangers*** campaigns.

Advantages: Absolute Direction; Acute Vision; High Pain Threshold; Luck; Reputation. Many 19th-century paleontologists were also Wealthy.

Disadvantages: Jealousy (other paleontologists); Obsession; Bad Reputation (other paleontologists). Roy Chapman Andrews (who led the 1922 Gobi expedition and inspired the character of Indiana Jones) was so notorious for hasty work that a specimen damaged by the collector is still referred to as "RCAed." Pacifism was a common disadvantage among Old West paleontologists such as Edwin Drinker Cope and Joseph ("Man Who Picks Up Bones While Running") Leidy; others, such as Othniel Charles Marsh, went fossil-hunting equipped with Winchester rifles, Colt revolvers and Bowie knives.

Skills: Zoology (Specialization: Paleozoology); Survival; Geology; Area Knowledge; Diplomacy; Research; Botany (Specialization: Paleobotany); Climbing; Riding; Driving; Artist; Photography; Languages; Guns. Paleontologists interested in the more recent past will also have Archaeology and Anthropology, and one, John Bell Hatcher, funded his expeditions with Gambling and Fast-Draw.

Carnivores

Amphicyon (Bear-Dog)

ST: 30-36 **Speed/Dodge:** 8/6 **Size:** 2-3
DX: 12 **PD/DR:** 1/2 **Wt:** 700-1,500 lbs.
IQ: 4 **Damage:** 2d-1 cut
HT: 14/24-30 **Reach:** C, 1# **Habitats:** F, P
Time: Middle Oligocene – Late Pliocene (30-2 mya)
Range: Europe, N. America

Amphicyon giganteus, the largest of the "bear-dogs," resembles a grizzly-sized bear with the head and tail of a wolf. It is less omnivorous than modern bears, preying mostly on the slow-moving herbivores of its time. Its claws are short and rather blunt, but it can slap for 2d+2 crushing damage at 1-hex reach, or bite for 2d-1 cut. Its hearing is poor for a carnivore (10) but its sense of smell acute (16).

Andrewsarchus

ST: 45-55 **Speed/Dodge:** 7/5 **Size:** 6+
DX: 11 **PD/DR:** 2/2 **Wt:** 1½-2½ tons
IQ: 3 **Damage:** 2d+2 imp
HT: 13/48-60 **Reach:** C, 1 **Habitats:** J, F, P
Time: Late Eocene (45-38 mya)
Range: Asia **Discovered:** 1924

The omnivorous *Andrewsarchus* is the largest mammalian predator to have walked the Earth – 19' long, and standing 8' tall at the shoulder. Its skull alone is 3' long and 2' wide, giving it a 1-hex reach; its teeth are very large and sharp, doing 2d+2 impaling damage. It seems to have been an ancestor of modern whales.

Andrewsarchus is too heavily-built for speed, but so are many Eocene herbivores, and it is powerful enough to attack even the largest. It also eats carrion, and intimidates smaller predators away from their kills as lions do. It is not a quiet or graceful creature; assume its Stealth skill is 10.

Basilosaurus

ST: 50-60 **Speed/Dodge:** 8/5 **Size:** 20-30+
DX: 10 **PD/DR:** 1/1# **Wt:** 5-10 tons
IQ: 3 **Damage:** 3d imp
HT: 16/55-65 **Reach:** C **Habitat:** SW
Time: Late Eocene (44 to 38 mya)
Range: Atlantic Ocean **Discovered:** 1834

Basilosaurus is a thin, small-headed early whale, 80 feet long, similar in appearance to the reptilian mosasaurs. It swims like a snake, undulating its cylindrical body and tail. Its head is only 5' long, and its beak-like mouth is filled with sharp saw-edged teeth. It can't swallow a human whole, but bites for 3d impaling damage. Once bitten, prey must make a ST roll to escape from the teeth; this inflicts a further 1d cutting damage. *Basilosaurus* feeds on fish and squid, like modern sperm whales.

Basilosaurus

Bears

Agriotherium

SEE P. 74

Hemicyon

ST: 15-19 **Speed/Dodge:** 8/6 **Size:** 2
DX: 13 **PD/DR:** 1/1 **Wt:** 300-800 lbs.
IQ: 4 **Damage:** 1d cr#
HT: 14/16-20 **Reach:** C **Habitats:** P, F
Time: Miocene (25-5 mya) **Range:** Asia, Europe, N. America

Hemicyon ("half-dog") is lightly built for a bear, with powerful legs, feet adapted for fast running, and a dog-like head and long tail. It grows to 5' long.

Hemicyon hunts by day, possibly using pack tactics to run down large herbivores. Like modern bears, it strikes with its claws for 1d crushing damage, or bites for 1d cutting damage.

Borhyeana

ST: 16-20 **Speed/Dodge:** 7/6 **Size:** 2
DX: 12 **PD/DR:** 1/1 **Wt:** 300-800 lbs.
IQ: 3 **Damage:** 1d cut
HT: 14/16-20 **Reach:** C **Habitats:** P, F
Range: S. America
Time: Late Oligocene to Early Miocene (30-20 mya)

Borhyeana was one of the most successful predators in South America for millions of years. It resembles a flat-footed bear the size of a wolf (about 5' long plus a long tail). A slow runner, it hunts from ambush; it also eats carrion, and intimidates smaller, faster predators away from their kills. It bites for 1d cutting damage.

Creodonts

Hyaenodon

ST: 18-22 **Speed/Dodge:** 7/6 **Size:** 2
DX: 12 **PD/DR:** 1/1 **Wt:** 250-350 lbs.
IQ: 3 **Damage:** 1d+1 cut
HT: 13-16 **Reach:** C **Habitats:** F, P
Time: Late Eocene – Early Miocene (44-20 mya)
Range: Africa, Europe, N. America, Asia
Discovered: 1838

Sarkastodon

ST: 40-50 **Speed/Dodge:** 6/5 **Size:** 3-4
DX: 11 **PD/DR:** 2/2 **Wt:** 1,500 lbs.-2 tons
IQ: 3 **Damage:** 2d+1 cut
HT: 13/40-50 **Reach:** C **Habitats:** F, P
Time: Late Eocene (44-38 mya)
Range: Asia

Creodonts had smaller brains and more primitive ears (Hearing rolls at 10) than modern carnivores, and are slower runners, but they were the dominant flesh-eating mammals throughout the northern hemisphere for some 30 million years. They range in size from weasel-like creatures to the enormous *Sarkastodon.*

Hyaenadon horridus ("rough hyena tooth") is slightly larger than a modern hyena, with longer hind legs. It probably behaved much like a hyena, using pack tactics to run down its prey, and eating carrion when available.

Sarkastodon grows up to 10' long, and resembles a bear with short claws and a long bushy tail. Its teeth are similar to those of a grizzly bear, suggesting that it eats fish and fruit as well as preying on brontotheres, rhinos and other large herbivores. *Sarkastodon* bites for 2d+1 cutting damage, or claws for 2d+2 crushing at 1-hex reach.

Eusmilus

ST: 20-25 **Speed/Dodge:** 5/6 **Size:** 2-3
DX: 13 **PD/DR:** 1/1 **Wt:** 180-240 lbs.
IQ: 3 **Damage:** 1d+1 imp
HT: 15/14-17 **Reach:** C **Habitats:** D, F, P
Time: Oligocene (38-25 mya)
Range: Europe, N. America

Eusmilus ("genuine knife") is an early "stabbing cat" with short legs and an elongated 8' body. It is not a fast runner, and stalks or ambushes brontotheres and other large, thick-skinned, slow-moving (and slow-thinking) prey (Stealth-16). It is a good climber, able to drop from trees onto its prey as leopards do.

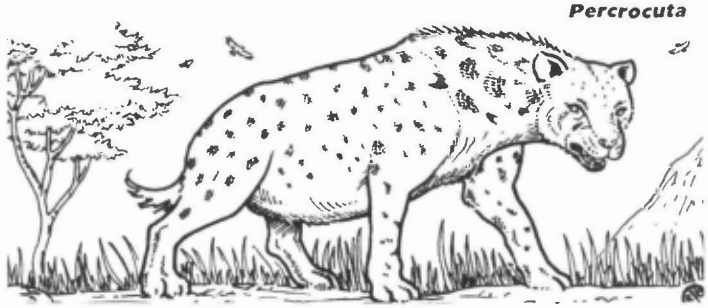
Hyena

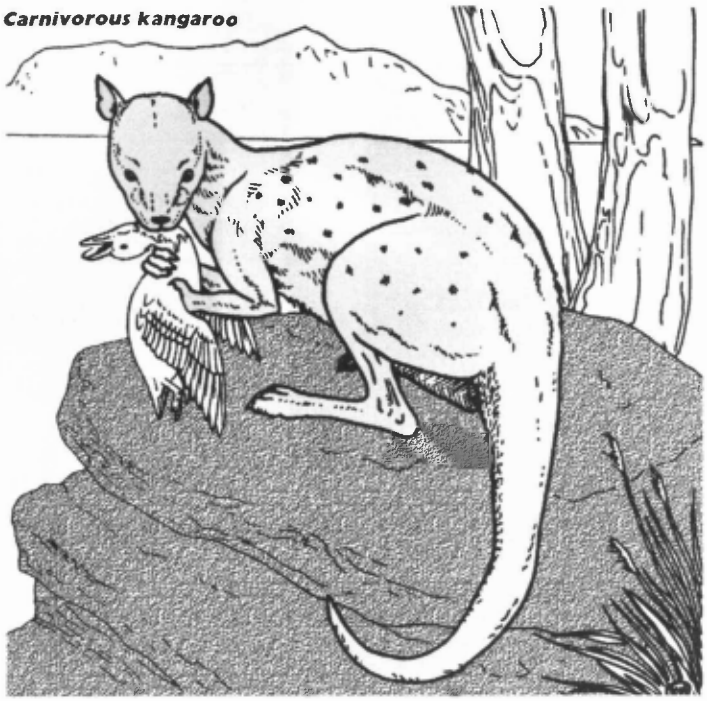
Percrocuta (Giant Hyena)

ST: 24-30 **Speed/Dodge:** 10/6 **Size:** 2-3
DX: 13 **PD/DR:** 1/1 **Wt:** 400-600 lbs.
IQ: 4 **Damage:** 2d-2 cut
HT: 15/30 **Reach:** C **Habitats:** P, D, J, F
Time: Middle – Late Miocene (20-5 mya)
Range: Africa, Asia, Europe

Percrocuta gigantea is similar to the modern hyena (*Crocuta crocuta*) in appearance and habits, but as large as a lion. See *Hyena*, p. 74.

Percrocuta





Carnivorous kangaroo

Kangaroo, Carnivorous

ST: 10-12 **Speed/Dodge:** 15/7 **Size:** 2
DX: 15 **PD/DR:** 1/1 **Wt:** 100-175 lbs.
IQ: 4 **Damage:** 1d+1 cut#
HT: 13-16 **Reach:** C **Habitats:** P, F, D, M
Time: Pliocene – Pleistocene (5-2 mya)
Range: Australia

The carnivorous marsupial *Propleopus* resembles an ordinary medium-sized (5' to 6' tall) kangaroo, except for its teeth – stabbing incisors, slicing premolars, and bone-snapping molars. It is larger and faster than the other predatory marsupials *Thylacoleo* (see below) and the "Tasmanian tiger" *Thylacinus,* and unlike *Megalania,* it is capable of prolonged chases. It might be a solitary hunter like the cheetah, or use pack tactics to run down diprotodonts and similar prey, but it is unlikely to be as gregarious as herbivorous kangaroos, who travel in groups (called troops or mobs) of a hundred or more. It is nocturnal, resting during the heat of the day.

When traveling at speed, kangaroos leap using their hind legs only, the tail acting as a balance and rudder. Kangaroos have been seen to leap 14 yards and over 9' fences (as well as over moving cars and motorcycles), but jumps of 9 yards across and 5' high are more common. A kangaroo's tail is strong enough to support its whole weight when necessary, enabling it to kick out with its hind feet for 1d+1 cutting damage. Carnivorous kangaroos also have sharp foreclaws, doing 1d cutting damage; their bite does 1d-1 cutting.

Megalania

ST: 20-30 **Speed/Dodge:** 9/6 **Size:** 8+
DX: 13 **PD/DR:** 1/2 **Wt:** 1,200-1,300 lbs.
IQ: 3 **Damage:** 1d+2 cut#
HT: 15/20-30 **Reach:** C# **Habitats:** P, D, F
Time: Pliocene – Pleistocene (5-2 mya)
Range: Australia

Megalania ("great ripper") is a giant monitor lizard growing up to 26' long – the largest known predator of Cenozoic Australia, and the only solitary hunter able to attack diprotodonts, giant kangaroos and dromornids. It resembles an enormous Komodo dragon, and probably hunts in the same fashion – waiting in ambush near water or a game trail, then charging out and biting any prey that passes by. Its tail can be used to knock down opponents (Contest of ST) in its back hexes, doing 1d+2 crushing damage to their legs.

Like Komodo dragons and large snakes, *Megalania* spends several days sleeping off large meals (which include carrion and eggs as well as fresh prey).

Megalodon

ST: 50-70 **Speed/Dodge:** 9/5 **Size:** 30-40+
DX: 10 **PD/DR:** 1/1# **Wt:** 10-25 tons
IQ: 2 **Damage:** 4d cut
HT: 12/55-65 **Reach:** C **Habitat:** SW
Time: Miocene – Pleistocene (20-2 mya)
Range: Worldwide

Carcharocles megalodon, commonly called by its species name (meaning "huge tooth") is a shark growing to 45' long; it preys on baleen whales, and apparently became extinct during the Ice Age.

Megalodon will eat anything that isn't big enough to eat it, including other sharks. The taste of blood in the water causes it to Berserk (p. B24), all-out attacking every turn until there is nothing left to eat . . . and sharks can scent blood from 1,000 yards away (Smell/Taste rolls at 16; Vision and Hearing rolls at 9). See *Shark*, p. 16.

An excellent set of *Megalodon* jaws can be seen in the Smithsonian.

Megantereon see p. 75

Pristichampus

ST: 16-20 **Speed/Dodge:** 3/7# **Size:** 4
DX: 14 **PD/DR:** 3/4# **Wt:** 200-300 lbs.
IQ: 3 **Damage:** 1d cut
HT: 14/14-18 **Reach:** C **Habitats:** F, P
Time: Eocene (55-38 mya)
Range: Europe, N. America

Pristichampus is a 10' long, heavily-armored land-dwelling crocodile with a long narrow snout like that of a gavial, saw-edged teeth similar to those of *Tyrannosaurus,* and blunt toes adapted for running: Speed 3 on land, sprints at 6. It preys on mammals small enough for it to swallow whole, and its habits are similar to those of the modern Komodo dragon. In other respects, treat it as a smallish crocodile (p. 22).

Megalania

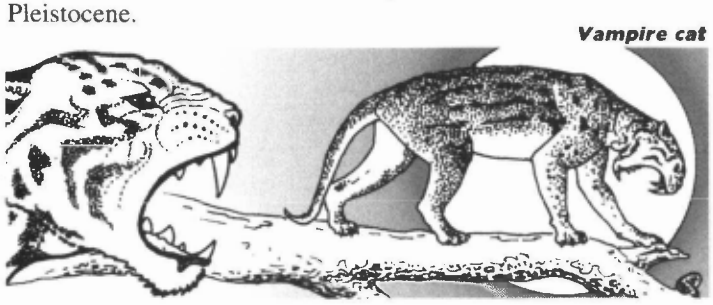
Purrusaurus

Time: Middle Miocene (15-12 mya)
Range: S. America **Habitat:** FW

Purrusaurus is an enormous Amazonian caiman, similar in size and behavior to *Phobosuchus* (p. 45). Use *Phobosuchus* statistics.

Quinkana

Quinkana is a land-dwelling crocodile very similar to *Pristichampus.* It survived in Australia – where there were few carnivorous mammals to compete with – well into the Pleistocene.



Terror Cat

ST: 10-16 **Speed/Dodge:** 6/6 **Size:** 1-2
DX: 12 **PD/DR:** 1/2 **Wt:** 75-150 lbs.
IQ: 3-4 **Damage:** 1d+2 imp
HT: 15/16-20 **Reach:** C **Habitat:** P
Time: Late Eocene – Middle Pleistocene (40 -.28 mya)
Range: Africa, N. America, Asia, Europe **Habitats:** P, D

There are two species of carnivore with the name "terror cat" – the African *Nimravus dinictis,* which survived from 40 mya-5 mya; and *Dinofelis abeli,* which spread across Africa, Europe, North America and Asia during the late Pliocene (4 mya), surviving until the mid-Pleistocene in Africa and until the early Pleistocene elsewhere. Though not closely related (*Nimravus* is not actually a cat, but a more primitive carnivore), they are very similar: both grow to about 4' long, and both are "false sabertooths," with canines shorter than those of the stabbing cats but longer than those of modern "biting cats."

Terror cats prey mostly on small mammals and birds, but they can drop from trees to attack larger prey – including australopithecines and *Homo habilis.*

Thylacosmilus

ST: 26-32 **Speed/Dodge:** 8/6 **Size:** 2
DX: 12 **PD/DR:** 1/1 **Wt:** 400-600 lbs.
IQ: 3 **Damage:** 2d+1 imp
HT: 14/20-24 **Reach:** C **Habitats:** P, F, D
Time: Late Miocene – Early Pliocene (12-4 mya)
Range: S. America **Discovered:** 1933

Thylacosmilus closely resembles a saber-toothed cat with a stubby tail and non-retractile claws. However, it is a carnivorous marsupial, adapted (like the stabbing cats) to preying on large, thick-skinned herbivores, and probably behaves much like *Smilodon* (p. 76).

Vampire Cat

ST: 20-25 **Speed/Dodge:** 9/7 **Size:** 2
DX: 14 **PD/DR:** 1/1 **Wt:** 180-240 lbs.
IQ: 4 **Damage:** 1d+1 imp
HT: 15/14-17 **Reach:** C **Habitats:** D, F, P
Time: Middle Miocene (15-12 mya)
Range: Africa **Discovered:** 1970

Vampirictys vipera ("vampire cat, viper") is a leopard-sized carnivore with narrow stiletto-like fangs and razor-sharp slicing molars. It is closely related to *N. dinictis*, and preys primarily on antelope. Its habits are probably similar to those of a modern leopard.

Herbivores

Except where noted, mammalian herbivores have Peripheral Vision, with Hearing-16, Smell-14 and Vision-12, and detect motion more easily than shapes: they probably won't notice humans who stand still or move very slowly. However, some may have Combat Reflexes, making them difficult to surprise.

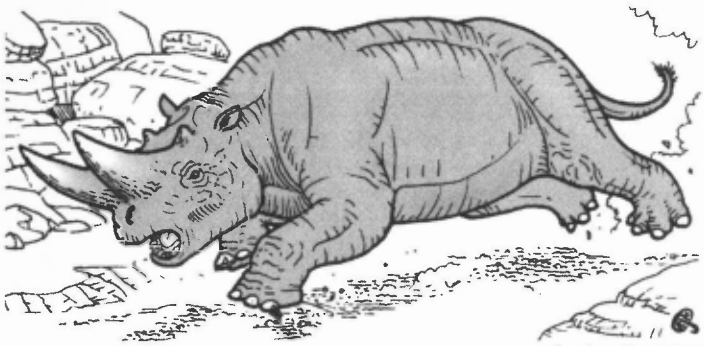
Ambelodon

ST: 175-200 **Speed/Dodge:** 8/0 **Size:** 10
DX: 12 **PD/DR:** 2/2 **Wt:** 3-5 tons
IQ: 3-4 **Damage:** 3d cr
HT: 17/30-40 **Reach:** - **Habitats:** P, S
Time: Late Miocene (12-5 mya)
Range: N. America

Ambelodon is a "shovel-tusker," an elephant-like mammal with a trough-like lower jaw more than 3' long, used for dredging plants from rivers and swamps. Its trunk is flattened to form an upper lip. Apart from this, it resembles a modern elephant, standing up to 10' high at the shoulder, and probably eats as much. If threatened, it can trample for 3d crushing damage, or slam with its shovel-tusk at one-hex range for 2d crushing damage.

Anancus see p. 77

Antelope see p. 77



Arsinotherium

Arsinotherium

ST: 120-150 **Speed/Dodge:** 11/5 **Size:** 8
DX: 9 **PD/DR:** 1/2 **Wt:** 1-2 tons
IQ: 3 **Damage:** 2d-1 cr#
HT: 17/30-40 **Reach:** C **Habitats:** F, P
Time: Early Oligocene (38-33 mya)
Range: Africa **Discovered:** 1920

Arsinotherium is nearly 12' long, stands 6' high at the shoulder, and resembles a rhinoceros with two huge, side-by-side conical horns covering the front half of its snout – though it is not closely related to rhinos, and its massive "horns" are hollow. Males use them for head-butting contests, and charge at potential threats as a bluff. They have difficulty hitting moving targets, and, being small-brained, if they miss their intended victim, they might well forget them immediately. They seem to be less aggressive than rhinos or other horned herbivores such as the uintatheres and brontotheres.

Arsinotherium's head butt does 2d-2 crushing damage in close combat; if it charges at Speed 10 or more, it does 4d-2 crushing, but must make a HT roll to avoid being stunned. If it loses a contest of ST by 10 or more points, it takes half the damage done by the animal with which it is butting heads (or, if it tries to butt an object such as an ATV, half the damage it would normally inflict). *Arsinotherium* can also trample for 2d crushing damage.

Brontothere

ST: 250+ **Speed/Dodge:** 9/5 **Size:** 15
DX: 10 **PD/DR:** 2/3# **Wt:** 4-7 tons
IQ: 3 **Damage:** 3d cr#
HT: 17/55-70 **Reach:** C **Habitat:** F#
Time: Eocene (38-25 mya)
Range: Africa, Asia, Europe, N. America
Discovered: 1887

Brontotheres ("thunder beasts") were huge, heavily built, small-brained herbivores that dominated the forests of the northern hemisphere for more than 13 million years, until the climate became drier and plains replaced the forests. The statistics above are for the largest, last and best known of the brontotheres, all 15' to 20' long and standing 8' high at the shoulder. Earlier (Eocene) species are smaller and hornless, from the 18" high *Eotitanops* to the 4' high *Dolichorhinus.*

Brontops is a North American brontothere with two round, bony knobs on its snout. It lives in swamps and forests. Males butt heads with each other, and several skeletons have been found with broken ribs from these battles.

Brontotherium is another North American species, with a huge Y-shaped blunt horn at the end of its snout. It lives in the forested foothills of the Rockies (then a highly volcanic area).

Embolotherium lives in the deserts and scrub of Mongolia. Its head is protected by a saddle-shaped plate of bone, which covered the face and back of the skull (rather like the frill of a ceratopsian) and curved up in front into a massive single 'horn' on the nose.

A brontothere's head butt does 3d crushing damage in close combat; if it charges at Speed 10 or more, it does 6d crushing, but must make a HT roll to avoid being stunned. If it loses a contest of ST by 10 or more points, it takes half the damage done by the animal with which it is butting heads (or, if it tries to butt an object such as an ATV, half the damage it would normally inflict). Brontotheres can also trample for 3d crushing damage.

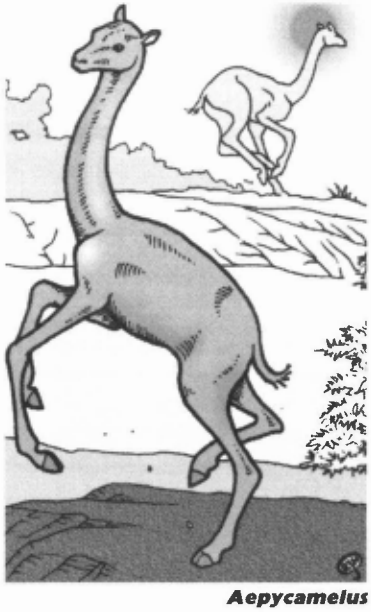
Camels

Aepycamelus (Alticamelus)

ST: 40-50 **Speed/Dodge:** 7/4 **Size:** 3
DX: 9 **PD/DR:** 1/1 **Wt:** 1,000-1,500 lbs.
IQ: 3 **Damage:** 1d+1 cr#
HT: 13/13-18 **Reach:** C, 1# **Habitats:** P, F
Time: Middle – Late Miocene (18-10 mya)
Range: N. America **Discovered:** 1887

Titanotylopus

ST: 50-60 **Speed/Dodge:** 7/4 **Size:** 3-4
DX: 9 **PD/DR:** 1/1 **Wt:** 1-2 tons
IQ: 4 **Damage:** 1d+2 cr#
HT: 13/15-21 **Reach:** C, 1# **Habitats:** P, F
Time: Pliocene to Pleistocene (2 mya-12,000 ya)
Range: N. America **Discovered:** 1924



Aepycamelus

Camels are usually associated with the African deserts, but they were only introduced there a paltry 2,500 years ago. They first evolved in late Eocene times, about 40 million years ago, in the temperate forests of North America. Their descendants migrated into Eurasia and South America less than five million years ago, and survived in North America until about 12,000 years ago.

Aepycamelus (previously known as *Alticamelus,* "high camel") is similar to a modern dromedary, but with longer legs and a longer neck; it stands up to 10'

Chapalmalania

high. It lives in forests, and lacks the fatty hump of desert-dwelling camels; its lifestyle is more like that of a giraffe. It can trample for 1d+1 crushing damage, or bite for 1d crushing with a 1-hex reach.

Titanotylopus is a gigantic camel, standing 11' to 12' high. It lives in grasslands and scrub; apart from lacking a hump, it is very similar to modern camels in appearance. It can trample for 1d+2 crushing damage, or bite for 1d+1 crushing with a 1-hex reach.

Whether or not these early camels can be domesticated and ridden like modern camels is up to the GM. A modifier of -2 to Riding skill because of the greater size seems appropriate.

Chalicotherium

ST: 50-60 **Speed/Dodge:** 5/4 **Size:** 3-4
DX: 8 **PD/DR:** 0/0 **Wt:** 1-1½ tons
IQ: 4 **Damage:** 2d cr#
HT: 13-16 **Reach:** C, 1 **Habitat:** F
Time: Miocene (25-5 mya)
Range: Europe, Asia

Chalicotherium has a head and body rather like those of a draft horse, but its legs are heavy and inflexible and end in curved claws like those of an anteater. Its forelimbs are longer than its hind legs, with larger claws. If attacked, it rakes with these claws for 2d crushing damage, being too slow to outrun predators. Its bite does only 1 point of crushing damage, its teeth being suited for soft leaves.

Chalicotherium grows up to 10' long and stands nearly 7' tall at the shoulder, its back sloping down to its hips. This, and its low speed, make it less than ideal as a riding or pack animal for time travelers: unfortunately, most horses of the time are only 3' to 4' high at the shoulder (see *Hipparion,* p. 69). Riding (*Chalicotherium*) skill defaults to Riding (Horse or Camel) at -2.

Chalicotheres may have survived into recent times; their likenesses appear in Siberian tombs from the 5th century BC. They may also be responsible for African legends of the "Nandi Bear."

Chapalmalania

ST: 15-19 **Speed/Dodge:** 7/6 **Size:** 2
DX: 13 **PD/DR:** 1/1 **Wt:** 200-700 lbs.
IQ: 4 **Damage:** 1d cr#
HT: 14/16-20 **Reach:** C **Habitat:** M
Time: Late Pliocene (3-2 mya)
Range: S. America

Chapalmalania is a raccoon the size of a medium-sized bear – about 5' long, without tail. It is similar in habits and general appearance to the giant panda, with an almost entirely herbivorous diet. If threatened, it strikes with its claws or bites for 1d crushing damage.

Cuvieronius see p. 79

Deinotherium see p. 79

Dinohyus

ST: 40-50 **Speed/Dodge:** 8/6 **Size:** 4
DX: 12 **PD/DR:** 2/3 **Wt:** 1,600-2,000 lbs.
IQ: 3 **Damage:** 2d+1 cut
HT: 15/44-55 **Reach:** C **Habitats:** F,P
Time: Miocene (25-5 mya) **Range:** N. America

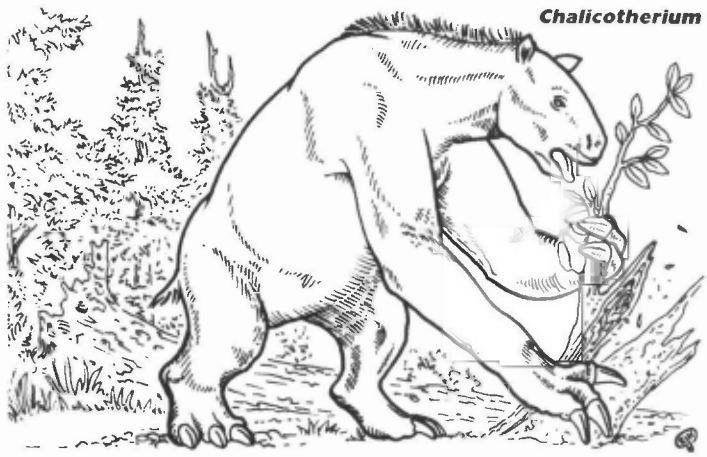
Dinohyus resembles a wild boar the size of a hippopotamus: 10' to 12' long, and 6' high. It is distantly related to pigs, and like the pig, it is omnivorous. It certainly eats carrion, and some scientists think it was an active hunter. It tramples for 1d+1 crushing damage, or slashes with its tusks for 2d+1 cutting.

Diprotodon see p. 79

Doedicurus (Glyptodont)

ST: 25-35 **Speed/Dodge:** 3/4 **Size:** 11
DX: 9# **PD/DR:** 4/7 **Wt:** 2,500-4,500 lbs.
IQ: 3 **Damage:** 2d-2 imp
HT: 17/25-30 **Reach:** 1 **Habitats:** P, F
Time: Oligocene – Late Pleistocene (38 mya-50,000 ya)
Range: S. America **Discovered:** 1839

Glyptodonts, ancestors of the armadillo, are the most heavily-armored mammals known. *Doedicurus* is one of the largest, and one of the best-defended, with a morningstar-like spiked



Chalicotherium

Gigantopithecus

end to its tail. It is 6' high, 15' long (including a 4' tail), 6' wide, and completely covered in fused hexagonal plates of bone: even its skull is protected by a bony "toupee." This armor weighs up to 900 pounds – roughly a fifth of the creature's weight – and is impregnable to any contemporary carnivore, even the saber-toothed *Thylacosmilus.*

If threatened, *Doedicurus* withdraws into its bony shell and swings its tail for 2d-2 imp (1-hex reach into all back hexes) until any attackers retreated. For most purposes, DX is 9, but for the tail-swing, DX is 12.

Left to itself, *Doedicurus* is a slow-moving, solitary, nocturnal herbivore. It has no biting teeth (only molars), and its powerful claws are used only for digging up roots and tubers.

Elasmotherium see p. 82

Gigantopithecus

ST: 25-30 **Speed/Dodge:** 9/6 **Size:** 1
DX: 12 **PD/DR:** 1/1 **Wt:** 500-700 lbs.
IQ: 5-6 **Damage:** 1d+1 cut, 2d cr#
HT: 15/20-30 **Reach:** C, 1 **Habitats:** F, M
Time: Late Miocene – Middle Pleistocene (12-1 mya)
Range: Asia

Gigantopithecus is an enormous ground-dwelling ape, similar in habits and appearance to the modern gorilla but standing 10' tall. Its diet is mostly vegetarian, but it probably eats small mammals and reptiles occasionally (as chimpanzees do).

Like modern apes, *Gigantopithecus* is gregarious, living in family groups of 5 to 20, and communicates with gestures. If provoked, it will try to bluff (Intimidation-15 because of its strength and height); if the attacker persists, *Gigantopithecus* will slam or grapple him (pp. B111-112) and bite for 1d+1 cutting damage.

A berserk *Gigantopithecus* might grapple an opponent's head with both hands and try to snap his neck: roll a Contest of the victim's ST or HT (whichever is greater), plus Toughness or natural DR, against the *Gigantopithecus'* "skill" of ST-4. If the victim wins or ties, he takes no damage. If the *Gigantopithecus* wins, he does swing/crushing damage (×1.5) to the victim's neck, potentially crippling it.

If *Gigantopithecus* is a tool-user like the chimpanzee, he can also throw rocks and other objects (thrust is 2d+2), or use improvised clubs (5d+1 crushing damage; default skill is only 7). An "uplifted" *Gigantopithecus* would be a formidable soldier, though the logistics of feeding it would be a major problem.

Ground Sloths

Glossotherium

ST: 30-40 **Speed/Dodge:** 7/6 **Size:** 1-4#
DX: 12 **PD/DR:** 1/1* **Wt:** ½-2 tons
IQ: 3 **Damage:** 2d cut
HT: 15/20-30 **Reach:** C, 1 **Habitats:** D, F
Time: Pliocene – Pleistocene (5 mya-11,000 ya)
Range: America

Megatherium

ST: 80-100 **Speed/Dodge:** 3/4 **Size:** 13
DX: 9 **PD/DR:** 1/1* **Wt:** 7-9 tons
IQ: 3 **Damage:** 4d cut
HT: 16/50-60 **Reach:** C, 1, 2 **Habitats:** D, F, P
Time: Pleistocene (2 mya-11,000 ya)
Range: America **Discovered:** 1856

Ground sloths are similar in appearance to modern tree sloths, down to the long tongue, enormous claws, and the algae that grow on their fur. However, they are much larger (up to 20' long), live in a much wider range of environments, have scutes (bony plates) embedded in their skin like many dinosaurs, and are able to eat almost any sort of plant.

Glossotherium is a 13' long ground sloth, heavily built with a large head. It walks on its knuckles, like a gorilla; if attacked, it rears up on its hind legs (becoming a 1-hex creature) and slashes with its long curved claws, doing 2d cutting damage at 1-hex range. Bony plates give it a DR of 1d-3 (minimum 1).

Megatherium is the largest of the ground sloths, able to rear up on its hind feet to reach leaves 20 feet from the ground. It has no biting teeth, only molars, but can use its huge claws to defend itself from *Thylacosmilus* and other predators, doing 3d cutting damage up to a 2-hex reach. Its scutes give it a DR of 1d-2 (minimum 1). It originated in South America, spreading north into the U.S. when a land bridge was formed.

Hipparion

ST: 15-20 **Speed/Dodge:** 8/5 **Size:** 2
DX: 10 **PD/DR:** 1/1 **Wt:** 400-500 lbs.
IQ: 3 **Damage:** 1d-2 cr
HT: 10-12 **Reach:** C, 1 **Habitat:** P
Time: Middle Miocene – Pleistocene (15-2 mya)
Range: N. America, Asia, Europe, Africa

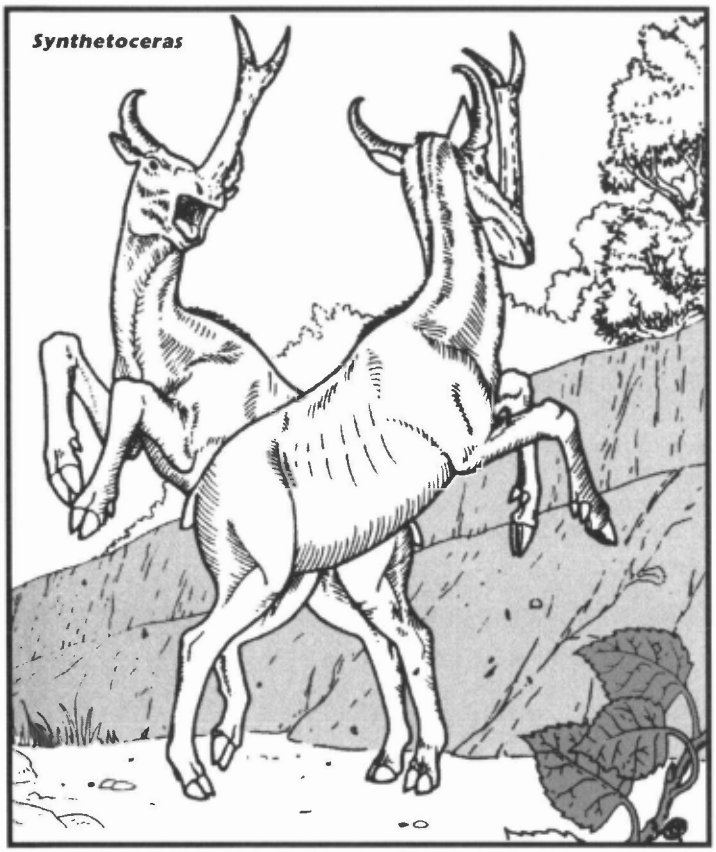
Hipparion, the largest of the Miocene horses, stands up to 4'6" high at the shoulders (the size of a small donkey; 13-2 hands for purists). Unlike modern horses, it has three toes on

each foot, though two of these are vestigial and do not touch the ground. Though lightly built, it might be domesticated as a pack animal by time travelers.

Hipparion's ancestors *Merychippus,* which roams the prairies of North America in the Middle to Late Miocene, and *Parahippus,* an Early Miocene forest-dweller, are similar but smaller (3'3" at the shoulder). Use *Hipparion* statistics, with ST 6-15; damage 1d-3 cr; HT 11/6-8.

Horse

see p. 80



Indricotherium

ST: 300+ **Speed/Dodge:** 6/0 **Size:** 15-20
DX: 9 **PD/DR:** 2/2 **Wt:** 16-20 tons
IQ: 3 **Damage:** 4d cr#
HT: 17/100 **Reach:** - **Habitats:** F, P
Time: Oligocene (38-25 mya)
Range: Asia

Indricotherium (also known as *Baluchitherium*) is the largest land mammal yet discovered – 26' long, nearly as tall, and weighing twice as much as the heaviest mammoth. Its skull alone is over 4' long, with large strong teeth, but it never deliberately bites anything as small as a human. Like a giraffe, it eats the topmost leaves of trees, and has difficulty lowering its head to the ground. Its only defense against predators is to trample for 4d crushing damage. The special trampling damage rules would apply here (see p. 32).

Mastodon

see p. 81

Moropus

Time: Early – Middle Miocene (25-15 mya)
Range: N. America **Discovered:** 1873

Moropus is a chalicothere, very similar to *Chalicotherium.* Use *Chalicotherium* statistics.

Platybelodon

Time: Late Miocene (11-5 mya)
Range: Africa, Asia, Europe **Habitats:** P, S

Platybelodon is a shovel-tusker, very similar to *Ambelodon* (p. 66). Use *Ambelodon* statistics.

Synthetoceras

ST: 20-25 **Speed/Dodge:** 12/7 **Size:** 2
DX: 15 **PD/DR:** 1/2 **Wt:** 500-700 lbs.
IQ: 4 **Damage:** 1d+1 imp#
HT: 14/13-16 **Reach:** C **Habitats:** M, F, S
Time: Late Miocene – Early Pliocene (11-4 mya)
Range: N. America **Discovered:** 1932

Synthetoceras is the largest and last of the protocerids ("first horns"), deer-like herd animals closely related to camels. It has a long, shallow skull, topped by two curved brow horns. Males also have a long, forked horn at the snout, used for sparring and display. Unlike deer antlers, they have strong cores of bone, and are not shed.

Synthetoceras makes an ideal cavalry animal for a caveman slapstick adventure, with its y-shaped nose horn serving as a slingshot (does thrust/crushing damage; other statistics as for Sling. Skill is P/E; defaults to DX-4 or Bow-2).

Herds of smaller protocerids (use antelope or ibex statistics) grazed the brushlands of North America from the late Eocene to the early Pliocene.

Toxodon

ST: 40-50 **Speed/Dodge:** 6/6 **Size:** 3-4
DX: 12 **PD/DR:** 2/3 **Wt:** 1-2 tons
IQ: 3 **Damage:** 1d+2 cr
HT: 15/44-55 **Reach:** -# **Habitats:** P, F
Time: Pliocene – Pleistocene (2.8 mya-15,000 ya)
Range: S. America **Discovered:** 1840

Toxodon is a heavily-built browser and grazer the size of a small rhinoceros, but hornless. It is a slow runner, as its hind legs are longer than its forelimbs and its hooves rather small. If attacked, its only defense is to trample, for 1d+2 crushing damage, or to bite, for 1d crushing.

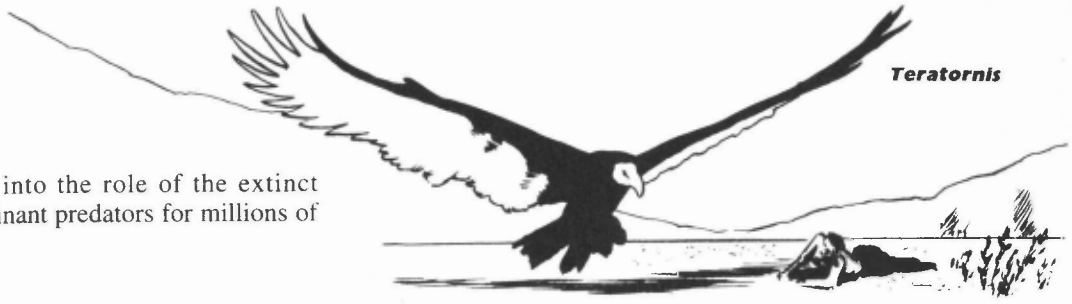
Uintatherium

ST: 100-125 **Speed/Dodge:** 6/4 **Size:** 10
DX: 8 **PD/DR:** 2/3 **Wt:** 3-5 tons
IQ: 3 **Damage:** 3d cr#
HT: 16/32-40 **Reach:** C **Habitat:** P
Time: Late Eocene (44-38 mya)
Range: Asia, N. America **Discovered:** 1872

Uintatherium is 10' to 12' long and 5' at the shoulder, roughly the size of a modern rhino. Six blunt, bony "horns" protrude from the top of its head, and sabrelike tusks jut down from its upper jaw. Its head butt does 3d crushing damage in close combat; it can also trample small predators for 3d crushing damage.

Birds

Birds were widespread and varied by the beginning of the Tertiary period. Most were similar to modern species in both appearance and behavior, but in many places, flightless birds stepped into the role of the extinct carnosaurs, and remained the dominant predators for millions of years.



Argentavis

ST: 13-16 **Speed/Dodge:** 14/7 **Size:** 9#
DX: 12 **PD/DR:** 1/1 **Wt:** 170-240 lbs.
IQ: 3 **Damage:** 1d+1 cut#
HT: 13-16 **Reach:** C **Habitats:** M, P
Time: Late Miocene (10-5 mya)
Range: S. America

Argentavis magnificens, the largest flying bird known, has a wingspan of eight yards and weighs almost as much as an ostrich. Standing on the ground, it is a one-hex animal nearly 6' tall.

Argentavis flies like a modern condor, gliding on thermals and rarely flapping its wings. It is a predator, not a scavenger, with powerful clawed feet and a deep hooked beak like that of a giant eagle. Fortunately for time-travelers, it can't swallow lumps more than six inches in diameter, and preys on the hare-sized herbivores that graze the pampas. On a swooping dive, it does 2d+2 impaling damage with its beak and claws, and does 1d+1 cutting damage in close combat when defending the nest. On the ground, its Speed is 2, and its Dodge is 5.

Diatryma

ST: 30-38 **Speed/Dodge:** 14/7 **Size:** 1
DX: 14 **PD/DR:** 1/1 **Wt:** 500-700 lbs.
IQ: 3 **Damage:** 2d+1 imp#
HT: 16/24-30 **Reach:** C, 1 **Habitat:** P
Time: Early Eocene (55-50 mya)
Range: Europe, N. America

The flightless *Diatryma gigantea* stands 7' tall, and has a head as large as a horse's. Its neck is short and thick, its wings useless foot-long stubs, but its powerful legs end in great clawed feet. It is the dominant predator of its time, hunting by day in packs, and intimidating smaller carnivores away from their kills. A *Diatryma's* massive beak does 2d+1 impaling damage; a kick does 2d impaling damage. Both have a 1-hex reach.

Diatrymas can be used as mounts by insanely courageous lost-worlders: give the rider or trainer a -4 to any training, Riding or Animal Handling roll.

Dromornis

ST: 45-50 **Speed/Dodge:** 6/5 **Size:** 1
DX: 10 **PD/DR:** 1/1 **Wt:** 800-1,200 lbs.
IQ: 3 **Damage:** 2d cr
HT: 16/30-35 **Reach:** C, 1 **Habitat:** F
Time: Miocene (25-5 mya)
Range: Australia

Dromornis is a 10' tall flightless bird, possibly the largest that ever lived. It has minuscule wings, a small beak, no talons on its feet, and apart from its sheer size and strength, is largely defenseless, though it can kick at 1-hex range for 2d crushing damage.

Moa (Dinornis)

ST: 35-40 **Speed/Dodge:** 10/7 **Size:** 1
DX: 14 **PD/DR:** 1/1 **Wt:** 500-700 lbs.
IQ: 3 **Damage:** 2d-1 imp
HT: 16/24-30 **Reach:** C, 1 **Habitat:** F
Time: Early Pleistocene – Recent (2 mya-200 ya)
Range: New Zealand

The moa *Dinornis maximus* is the tallest bird known to have existed – at 11½', it is more than 18" taller than the largest *Phorusrhacus* or elephant bird. It is more lightly built and faster than *Dromornis,* with taloned feet capable of a vicious kick. It lives mostly in forests, where it browses for seeds and fruit.

Phorusrhacus

ST: 30-38 **Speed/Dodge:** 14/7 **Size:** 1
DX: 14 **PD/DR:** 1/1 **Wt:** 500-700 lbs.
IQ: 3 **Damage:** 2d+1 imp#
HT: 16/24-30 **Reach:** C, 1 **Habitat:** P
Time: Early Miocene – Early Pleistocene (25-1.5 mya)
Range: S. America

Phorusrhacus ("terror crane") is a flightless predator, similar to *Diatryma* in appearance and behavior. Species range in height from 5' to 10' tall, with heads up to 18" long.

Teratornis

ST: 4-6 **Speed/Dodge:** 15/7 **Size:** 7
DX: 14 **PD/DR:** 0/0 **Wt:** 30-60 lbs.
IQ: 4 **Damage:** 1d-3 cut
HT: 13/5-7 **Reach:** C **Habitats:** P, M
Time: Late Miocene – Recent (11 mya-4,000 ya)
Range: America

Teratornis ("monster bird") is a giant vulture with a seven-yard wingspan. Standing on the ground (Speed 1, Dodge 6), it is a one-hex creature about 5' tall. Its habits are similar to those of modern vultures; assume that it won't attack humans unless they're trapped or on the verge of death. Remains of several have been discovered in the La Brea tar pits.

6 PLIOCENE AND PLEISTOCENE

5 mya to 100,000 years ago

The first hominids appeared on the southern African savannah during the Pliocene. The world was cooling and becoming drier, and grasslands were replacing the forests, creating a niche for apes who could walk upright, looking over the high grasses. The hominids – australopithecines, *Homo habilis* and early *Homo erectus* – were confined to the savannah by the uninhabitable Sahara desert, until the world cooled still further in the mid-Pleistocene, and the hominids expanded into Europe and Asia. About 200,000 years later, the Gunz glacial period began.

Although the world of the Pleistocene Ice Ages was a challenging environment, it was not a barren one. Europe, Asia and North America, where the earth wasn't covered by ice, were forested with tall stands of pine, spruce and fir. During the short summers, raspberry and rose bushes, horsetails and mosses thrived underneath the trees. Between the groves were meadows of grass, wild oats, wheat, clover and alfalfa. Along the banks of the icy streams and lakes grew cattails and rushes; in them swam salmon, trout, sturgeon, cod and pike. And everywhere there were wildflowers – infinite in color and variety.

These fields and woodlands teemed with game, crowded together by the advancing glaciers. Vast herds of reindeer, horses, aurochs, mammoths and ibex thrived, in addition to more solitary animals like the woolly rhinoceros and the herbivorous cave bear. The ice age environment was also home to many smaller animals, including rabbits, lemmings, marmots, porcupines, squirrels and field mice. Waterfowl and other birds were also common. Many predators, large and small, competed for food: the dire wolf, cave lion, sabertoothed cat, lynx, eagle, owl, weasel, fox, badger and bear.

When the long winters began, most herd animals migrated south where foraging was easier. Predators, including man, followed them. However, there was no escaping the harsh weather which killed the weak, the very young and the old. Where moist sea air met air chilled by the great glaciers, the snow fell heavy and often. As the cold killed off the plants and snow covered the ground, food for deer, horses and other herd animals became scarce. As they died, so did those species which preyed upon them. Only the strongest survived until the spring thaw, when plains and forests would once again be inundated with plant and animal life.

At first glance, humans seem ill-equipped to meet the challenges of this harsh world. They lacked the thick fur of the cave bear, the tough hide of the woolly rhinoceros, or the sharp claws and teeth of the lion. To ward off cold and starvation they had only their dextrous hands and intellect. Yet, while the rest of the animal world could only adapt to the environment, humans could – and did – adapt the environment to their advantage. They fashioned tools from stone, wood and bone to replace the sharp teeth and claws they lacked. They learned to cure and work the hides from the animals they killed, and made warm clothing and blankets. Nothing went to waste. Eventually humans learned to build their own shelters from wood, stone, moss and hides. The tents and huts they constructed eliminated the need to find caves in which to shelter – the original denizens of which were often dangerous and not disposed to move.

Perhaps most important, humans knew how to cooperate as no other animal could. They developed tactics for herding and killing large numbers of animals, so that a few hunters could feed and supply a large tribe.

Humans of the Pleistocene knew the habits and life cycles of the creatures they hunted, and exploited them. They studied the changing of the seasons and discovered the best game during each. They drove migrating reindeer into rivers where the animals were hampered by the deep water. Horse and ibex herds were chased into box canyons where they could be slaughtered. They waited patiently for the annual migrations upstream of Atlantic salmon, and the seals that would follow them. Cooperative effort even extended beyond a single family or tribe; two or more bands would occasionally join forces to tackle a particularly large job, such as hunting an entire mammoth herd.

All of these strategies for survival were passed on from generation to generation through the tribal culture. By listening to stories told around the campfire on long winter nights and watching dances which reenacted the events of a hunt, young children learned about their environment and the ways for dealing with it. The social ties which bound the tribe together were reinforced by religious ceremonies. These ceremonies, always involving the entire tribe, emphasized the importance of kinship and cooperation.

Humankind's long climb from unthinking animal to master of adaptive technology was not accomplished in a few thousand years, or even a few hundred thousand – it was a process lasting at least three and a half million years. For much of that time, progress was slow. When confronted with the onslaught of the Pleistocene ice ages, however, humans had to develop rapidly if they were to survive.

The animals described below were familiar to the earliest humans, and are an essential part of any Pleistocene or Pliocene campaign.

Carnivores

Bears

Agriotherium

ST: 27-33 **Speed/Dodge:** 7/6 **Size:** 3#
DX: 12 **PD/DR:** 1/2 **Wt:** 1,000-1,500 lbs.
IQ: 4 **Damage:** 2d-2 cr#
HT: 14/24-30 **Reach:** C **Habitats:** M, P
Time: Late Miocene – Pleistocene (12-2 mya)
Range: Africa, Asia, Europe

Brown Bear

ST: 15-19 **Speed/Dodge:** 7/6 **Size:** 2#
DX: 13 **PD/DR:** 1/1 **Wt:** 200-700 lbs.
IQ: 5 **Damage:** 1d cr#
HT: 14/16-20 **Reach:** C **Habitats:** F, M, S
Time: Early Pleistocene (2 mya) to Present
Range: Asia, Europe, N. America

Cave Bear

ST: 27-33 **Speed/Dodge:** 7/6 **Size:** 3#
DX: 12 **PD/DR:** 1/2 **Wt:** 1,200-1,600 lbs.
IQ: 5 **Damage:** 2d-2 cr#
HT: 14/24-30 **Reach:** C **Habitats:** M, P
Time: Early Pleistocene – Recent (2 mya-2,000 ya)
Range: Europe, N. America

Bears are omnivores, and most eat more plants than meat. They avoid humans if possible, but can be dangerous if surprised. Make a reaction roll to determine whether the bear is hungry or aggressive, or just gets out of the way. Mother bears protecting their cubs react to humans at -8.

Bears strike with their claws for crushing damage, or bite for the same amount of cutting damage. Cave bears can also "bear-hug," grappling in close combat and then biting.

A bear walking on all fours is a 2-hex or 3-hex animal. When standing on its rear legs to fight, it occupies only 1 hex.

Agriotherium is an omnivorous primitive bear, slightly larger than the modern Kodiak bear, with a rather wolf-like face. The cave bear is gregarious, almost completely herbivorous, and only goes into caves during its winter hibernation. There is no evidence that it hunted early humans, but humans certainly hunted it.

Cave Lion

ST: 34-42 **Speed/Dodge:** 9/6 **Size:** 2-4
DX: 12 **PD/DR:** 2/2 **Wt:** 500-700 lbs.
IQ: 4 **Damage:** 2d cut
HT: 15/24-30 **Reach:** C **Habitats:** M, P
Time: Early Pleistocene – Recent (2 mya-2,000 ya)
Range: Europe, N. America

These, the largest cats ever known, were frequently hunted by humans: despite this, they survived in the Balkans until approximately 2,000 years ago. Their likenesses were painted on cave walls, but little is known about their habits. Assume that they behave like modern lions, with similar sense rolls (including Combat Reflexes) though they may not have learned to fear humans.

Cheetah

ST: 16-20 **Speed/Dodge:** 30/10 **Size:** 2
DX: 14 **PD/DR:** 0/0 **Wt:** 110-160 lbs.
IQ: 4 **Damage:** 1d cut
HT: 13-16 **Reach:** C **Habitats:** P, D
Time: Pleistocene – Present
Range: Africa, Asia, N. America

Cheetahs are the fastest land animals, averaging speeds of 50-60 miles per hour, but having been clocked at speeds up to an incredible 75 mph. For all practical purposes, they can accelerate instantly from a dead stop to full speed.

They are diurnal cats with many dog-like features: long legs made for running, not springing; claws that do not fully retract; trainability; a lack of stalking ability. They hunt by outrunning their prey, knocking it down with a forepaw, then strangling it with their bite. Their claws are blunt by cat standards; treat their swipe as a slam attack doing no damage. They bite in close combat for 1d cutting damage.

Hyena

ST: 9-18 **Speed/Dodge:** 16/8 **Size:** 2
DX: 13 **PD/DR:** 1/1 **Wt:** 100-200 lbs.
IQ: 4 **Damage:** 1d cut
HT: 12/13-16 **Reach:** C **Habitats:** P, D, J, F
Time: Pliocene (5 mya) – Present
Range: Africa, Asia, Europe

Hyenas are dog-like scavengers with large heads and ears, short manes and tails, and powerful jaws that can crack bones easily. Their front legs are longer than their rear legs, giving them a sloped look. They are nocturnal animals, living in pairs or small packs, with the females being larger and more dominant than the males.

Hyenas' reputation for cowardice is largely undeserved. They are predators as well as scavengers, running down prey as dogs do. Hyena packs will even chase lions away from their kills.

Hyenas have been known to attack humans, usually sleeping campers or lone unarmed travelers. They will often attack a sleeper's face, causing disfigurement at the least. If cornered, hyenas will fight viciously, biting in close combat for 1d cutting damage. Their bites are dirty; anyone bitten must roll against HT for possible infection (see p. B116).

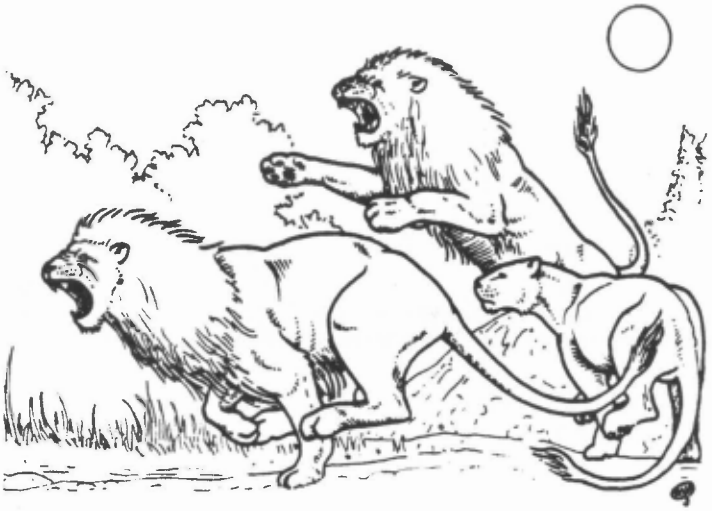
Jackal

ST: 2-5 **Speed/Dodge:** 9/7 **Size:** 1
DX: 14 **PD/DR:** 0/0 **Wt:** 10-20 lbs.
IQ: 4 **Damage:** 1d-3 cut
HT: 12/5-7 **Reach:** C **Habitats:** J, F, D, P
Time: Pliocene – Present
Range: Africa, Asia

The common jackal is a small dog-like animal, measuring up to 18" at the shoulder and 2' in length. Jackals are primarily scavengers, though they often kill small prey and may raid an occasional chicken coop. They sometimes enter villages and even cities at night to scrounge for garbage. They are primarily nocturnal animals, travelling singly or in pairs, though they are occasionally found in packs. Jackals are no threat at all to modern humans – an entire pack will flee even a lone human – but they may have been a danger to australopithecines and *Homo habilis*.

Leopard

ST: 20-25 **Speed/Dodge:** 9/7 **Size:** 2
DX: 14 **PD/DR:** 1/1 **Wt:** 180-240 lbs.
IQ: 5 **Damage:** 1d+1 cut
HT: 15/14-17 **Reach:** C **Habitats:** J, F, M, D, P
Time: Pliocene – Present
Range: Africa, Asia



Leopards are solitary, nocturnal hunters; the archetypal stalkers of the animal kingdom, widely considered the second most dangerous animal on Earth (after man), and death incarnate to the australopithecines in *2001: A Space Odyssey*. Shy, cunning and wary, their keen senses (Vision, Hearing, Taste/Smell and Danger Sense at 18) and remarkable hiding ability (Stealth 18) also make them hard to track. They are somewhat smaller than lions or tigers, and much more arboreal; they can climb trees at their normal speed, even while carrying an antelope carcass, or drop from trees onto their prey (or, if kept as pets, onto their owners). They can jump three yards straight up without a running start, and five yards in a running broad jump. They dislike water, but can swim (Speed 2) if necessary.

When attacking, they go for the throat, biting in close combat for 1d+1 cutting damage. They are particularly fond of dogflesh – there are recorded instances of leopards dashing out of the bush to snatch a dog from in front of a hunter, or sneaking into a tent to steal one chained to a bed. They generally avoid humans, but man-eaters are not unknown.

Lion

ST: 24-30 **Speed/Dodge:** 10/6 **Size:** 2-3
DX: 13 **PD/DR:** 1/1 **Wt:** 400-600 lbs.
IQ: 4 **Damage:** 2d-2 cut
HT: 15/30 **Reach:** C **Habitats:** P, J, D, M
Time: Pliocene (5 mya) – Present
Range: Africa, Asia, Europe

Unlike most cats, lions are social animals, living in groups (prides) that number anywhere from 3 to 20 in size. Larger prides are common in the more open grasslands.

Lions prefer the plains, but will occasionally venture into desert, mountains and, more rarely, jungle. They often hunt singly, though they are capable of cooperative effort: a lioness or two will lie up in the tall grass, while the males herd the prey in their direction; the whole pride will share in the kill. Lions are more diurnal than most cats, but adapt well to a nocturnal existence if hunted by humans.

Most encounters with humans end with the lions fleeing rapidly. However, if wounded, a lion will charge angrily and attempt to kill anyone in its way. Likewise, running away from one will sometimes spark its instinct to chase. Occasional man-eaters have been reported – generally, old or wounded lions.

Lions attack in close combat, biting and clawing for 2d-2 cutting damage. The actual attack is usually on the neck, strangulation being the most common method of killing.

Megantereon

ST: 26-32 **Speed/Dodge:** 8/6 **Size:** 2
DX: 12 **PD/DR:** 1/1 **Wt:** 400-600 lbs.
IQ: 3 **Damage:** 2d imp
HT: 14/20-24 **Reach:** C **Habitats:** P, F, D
Time: Late Miocene – Early Pleistocene (10-2 mya)
Range: Africa, Asia, Europe, N. America

Megantereon ("big chin") is a dirktooth, the ancestor of the sabertoothed *Smilodon*. It originated in India, and spread throughout the northern hemisphere. Apart from slightly smaller teeth (which could be sheathed in a flange in its chin, hence its name), it is very similar to *Smilodon* in appearance and (probably) behavior.

Rhamphosuchus

ST: 48-58 **Speed/Dodge:** 8/6# **Size:** 14-17
DX: 13 **PD/DR:** 3/4# **Wt:** 5-10 tons
IQ: 3 **Damage:** 3d-2 cut#
HT: 14/40-50 **Reach:** C# **Habitat:** FW
Time: Pliocene (5-2 mya)
Range: India

Rhamphosuchus is a gigantic gavial which reaches a length of 50', and preys on smaller crocodiles and large fish, though it may also ambush land animals that come to the rivers to drink. Treat it as a modern crocodile (p. 22) in most respects, with a tail-whip of reach 3.

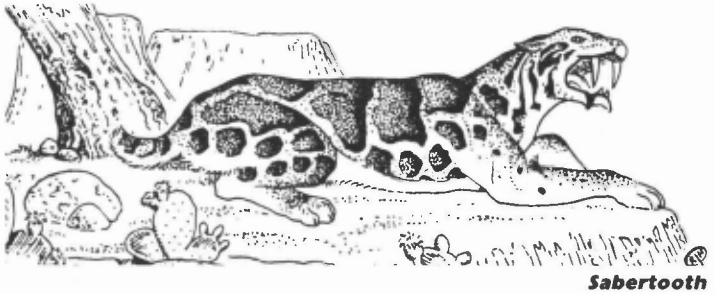
Sabertooth (Smilodon)

ST: 26-32 **Speed/Dodge:** 8/6 **Size:** 2
DX: 12 **PD/DR:** 1/1 **Wt:** 400-600 lbs.
IQ: 4 **Damage:** 2d+1 imp
HT: 14/20-24 **Reach:** C **Habitats:** P, F, D
Time: Pliocene – Late Pleistocene (5 mya-10,000 ya)
Range: America **Discovered:** 1868

The "sabertoothed tiger," *Smilodon,* is not closely related to tigers, or any other modern cat. It is powerfully built, rather like a lion, and despite its name, there is no evidence that it was (or wasn't) striped.

By cat standards, *Smilodon* has poor night vision and short legs. It hunts by daylight, ambushing its prey – mostly mammoths and mastodons – from cover, hanging on with its claws (1d+1 cutting) and then biting them repeatedly in the neck until they bled to death. *Smilodon* teeth are serrated, up to 11" long, and do extra damage for their ST – 2d+1 impaling in close combat. Like picks, they can get stuck (p. B96), or break if they hit bone.

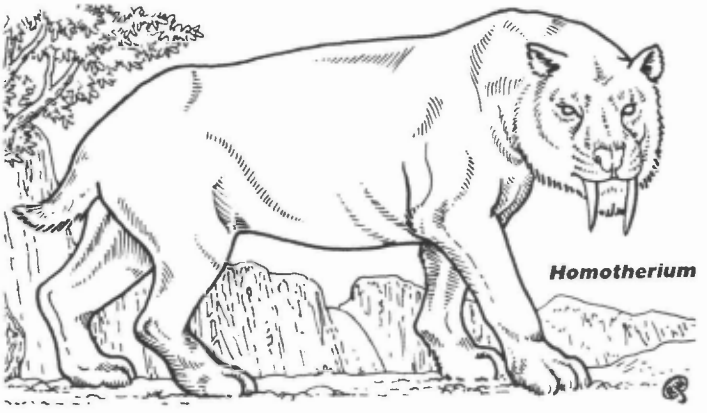
More than 2,000 *Smilodon* skeletons have been recovered from the La Brea tar pits, suggesting that (unlike cave lions) they weren't smart enough to avoid such traps, much less compete for food with humans. Early humans hunted sabertooth, and contributed to their extinction by wiping out their prey, the mammoths (both animals became extinct at roughly the same time). But *Smilodon* can't have been easy prey: human skulls have been found with sabertooth-sized holes in them.



Sabertooth

Scimitar Cat (Homotherium)

ST: 22-28 **Speed/Dodge:** 9/6 **Size:** 2-3
DX: 13 **PD/DR:** 2/2 **Wt:** 300-700 lbs.
IQ: 4 **Damage:** 1d+2 cut
HT: 15/20-24 **Reach:** C **Habitats:** M, P, F
Time: Early – Late Pleistocene (2 mya-14,000 ya)
Range: Africa, Asia, Europe, N. America



Homotherium

Homotherium is a strange-looking cat; its head is long and narrow, its neck long and thick, its tail very short, and its forelegs longer than its hind legs, giving it the sloping look of a hyena. Its claws are not fully retractile, and it has a flat-footed walk (unlike modern cats, which walk on their toes). It is a good runner, but a poor jumper, and too heavy for tree-climbing.

Its scimitar-like teeth have sharp serrated edges, and are used for slicing, not stabbing. It preys mostly on mammoth and mastodon calves: a mass grave of scimitar cats, found in a cave in Texas, included hundreds of mammoth milk teeth. Scimitar cats are gregarious like lions, and probably behaved similarly in most other respects.

Teratornis **see p. 71**

Terror Cat **see p. 66**

Thylacoleo

ST: 20-25 **Speed/Dodge:** 9/6 **Size:** 2
DX: 13 **PD/DR:** 1/1 **Wt:** 180-240 lbs.
IQ: 4 **Damage:** 1d+1 cut
HT: 15/14-17 **Reach:** C **Habitats:** P, F
Time: Pleistocene (1.8 mya-10,000 ya)
Range: Australia **Discovered:** 1859

Thylacoleo carnifex ("executioner marsupial lion") is a leopard-sized predator with long powerful legs, heavy (non-retractile) claws, and a short cat-like face. Its large, sharp-edged incisors give it a buck-toothed appearance and a vicious bite, doing 1d+1 cutting damage. Little is known of its habits, but it is probably a solitary hunter, stalking or chasing its prey – medium-sized marsupials – by day, holding on with its claws for 1d-1 cutting damage and biting in close combat. It may also be arboreal, preying on koalas and possum. Alternatively, it may use pack tactics to hunt large, slow marsupials like *Diprotodon.*

Wolves

Dire Wolf

ST: 13-16 **Speed/Dodge:** 7/6 **Size:** 1
DX: 12 **PD/DR:** 1/1 **Wt:** 150-200 lbs.
IQ: 4 **Damage:** 1d cut
HT: 13-17 **Reach:** C **Habitats:** P, M, A, F
Time: Pleistocene – Recent (2 mya-10,000 ya)
Range: N. America

The dire wolf is the sturdy but slow precursor of the modern wolf. They are active both day and night, in packs of 4 to 40 animals. Scavengers rather than predators, they often attack animals in distress – injured, old, abandoned young, those trapped in rock slides or mire. Less intelligent than modern wolves, they also lack Danger Sense: the La Brea tar pits contain more skeletons of dire wolves than of any other mammal.

Dire wolves have no fear of humans. They will attack them using pack tactics, and will not be driven off until they have suffered at least 50% casualties.

Modern Wolf

ST: 8-10 **Speed/Dodge:** 9/7 **Size:** 1
DX: 14 **PD/DR:** 1/1 **Wt:** 70-170 lbs.
IQ: 5 **Damage:** 1d-2 cut
HT: 11-13 **Reach:** C **Habitats:** P, M, A, F
Time: Pleistocene (2 mya) – Present
Range: Asia, Europe, N. America

The wolf is a ferocious and intelligent carnivore with great fighting ability and endurance. They are largely, but not exclusively, nocturnal. Packs range from 4 to 40 animals, but lone wolves are also occasionally encountered. Wolves mate for life and are quite protective of their mates and cubs.

Wolves usually hunt in packs, biting in close combat for 1d-2 cutting damage. They tend to rush in, bite out a piece of flesh, then dodge away while the other wolves do the same. Eventually, the prey weakens from shock and loss of blood, and can be dragged down. Wolves rarely attack humans unless the climate is so severe that other prey is very scarce. Humans, however, often attack wolves; their fur has been prized since Cro-Magnons used it to line cold-weather clothing.

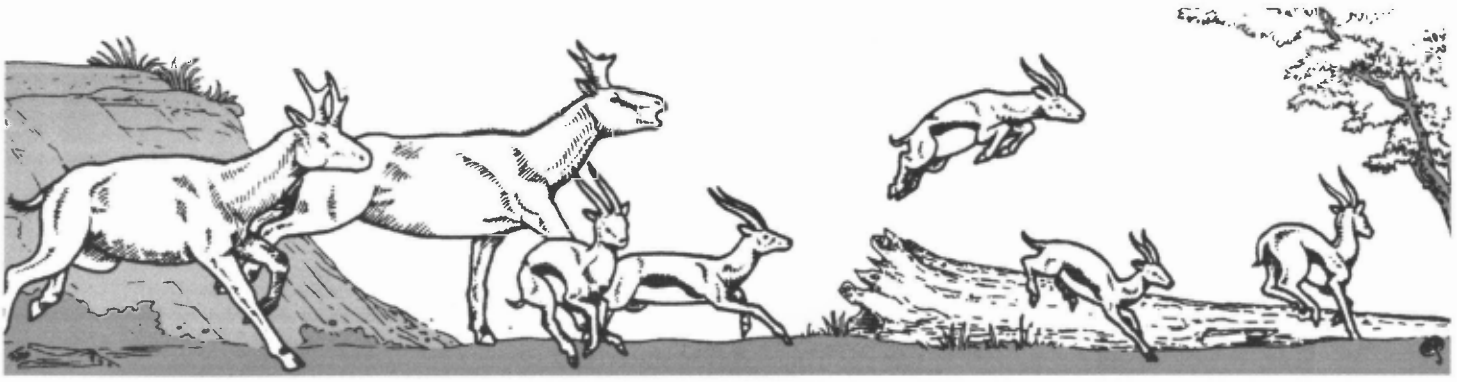
Wolverine, Pleistocene

ST: 13-16 **Speed/Dodge:** 8/6 **Size:** 1
DX: 12 **PD/DR:** 2/2 **Wt:** 50-100 lbs.
IQ: 5 **Damage:** 1d-1 cut
HT: 12-14 **Reach:** C **Habitats:** F, A, M
Time: Pleistocene (2 mya-8,000 ya)
Range: Europe, N. America

The Ice Age wolverine is larger than its modern descendant, with the same bad temper and no fear of humans. The second-largest member of the mustelid (weasel) family, it measures up to 5' long and stands 2' high at the shoulder. Strong and vicious for its size, it can bring down a moose, or drive bears from their kills. It bites for 1d-1 cutting damage.

The modern wolverine is active for four hours at a time, then rests for four hours, continuing this cycle throughout day and night. Assume that the Pleistocene wolverine does the same.

Herbivores



Except where noted, mammalian herbivores have Peripheral Vision, with Hearing-16, Smell-14 and Vision-12, and detect motion more easily than shapes: they probably won't notice humans who stand still or move very slowly. However, some may have Combat Reflexes, making them difficult to surprise.

Anancus

ST: 175-200 **Speed/Dodge:** 8/0 **Size:** 10
DX: 11 **PD/DR:** 1/2 **Wt:** 3-5 tons
IQ: 4 **Damage:** 3d+2 imp#
HT: 17/30-40 **Reach:** 3-4 **Habitat:** F
Time: Late Miocene – Early Pleistocene (11-1.5 mya)
Range: Asia, Europe

Anancus is a fairly small elephant, standing 10' high at the shoulder, but its tusks are an ivory hunters' dream – up to 13' long and jutting straight ahead. These tusks do 3d+2 impaling damage with Reach 4, but are extremely unwieldy (-4 to hit). *Anancus* can also trample for 3d crushing damage. Treat it as an elephant in all other respects.

Antelope

ST: 15-20 **Speed/Dodge:** 18/9 **Size:** 2
DX: 15 **PD/DR:** 0/0 **Wt:** 250-350 lbs.
IQ: 4 **Damage:** 1d+1 imp
HT: 12-14 **Reach:** C **Habitats:** M, F, S
Time: Late Miocene (6 mya) – Present
Range: Africa, Asia, N. America

Antelopes are ungulates (hoofed animals) vaguely resembling deer, cattle and mountain goats. The category is a loose one, including widely differing species such as bongos, bushbucks, dik-diks, duikers, gazelles, gnus, impalas, kudus, sables, springboks, etc.

In most species of antelope, both males and females have horns. These horns vary from species to species – some are long, others are short, straight, curved or twisted. Antelopes also vary greatly in size. The statistics given are for a middle-sized antelope – the smallest antelopes are rabbit-sized!

Antelopes are diurnal grazing animals. Most species live in large herds of 100 or more animals; others are found in groups of 6 to 20. They are quite edible, though the meat is drier and coarser than that of deer, and formed a major part of the diet of *Homo habilis*.

They are timid; a herd will flee if approached, with the males lagging behind, staying between the predator and the rest of the herd. If cornered, an antelope will turn and face its attacker, striking with horns and hooves. Antelopes do either impaling or crushing damage, depending on the type of horns. Hooves do 1d-1 crushing damage, either kicking or trampling.

Aurochs

ST: 48-60 **Speed/Dodge:** 8/4 **Size:** 3
DX: 9 **PD/DR:** 1/1 **Wt:** 1,000-2,500 lbs.
IQ: 4 **Damage:** 1d+2 imp#
HT: 13-16 **Reach:** C **Habitats:** P, F
Time: Pleistocene – Recent (2 mya-300 ya)
Range: Africa, Asia, Europe

The aurochs is the ancestor of modern domestic cattle. It originated in Asia, but spread across Europe and North Africa by the end of the Wurm Ice Age. Well-known by early humans (its likeness appears on the walls of Lascaux and other caves), it is extensively hunted, and first domesticated about 6,000 years ago. By medieval times, it had become rare, and has been extinct since the 17th century.

Treat aurochs like any other herd herbivore – they will flee if threatened. Males protect the herd by charging and trampling. Their horns do 1d+2 impaling damage; their trample does 1d+1 crushing damage.

Baboons

Modern Baboon

ST: 9-11 **Speed/Dodge:** 12/7 **Size:** 1
DX: 14 **PD/DR:** 0/0 **Wt:** 50-90 lbs.
IQ: 6 **Damage:** 1d-2 cut
HT: 18/8-10 **Reach:** C **Habitats:** P, J, F
Time: Late Pliocene (3 mya) – Present
Range: Africa

Theropithecus (Giant Baboon)

ST: 15-18 **Speed/Dodge:** 10/7 **Size:** 1-2
DX: 14 **PD/DR:** 1/1 **Wt:** 150-200 lbs.
IQ: 6 **Damage:** 1d cut
HT: 18/13-16 **Reach:** C **Habitats:** P, J, F
Time: Middle Pliocene – Recent (3.5 mya-10,000 ya)
Range: Africa

Baboons are the largest and smartest of the monkeys, though neither as smart nor as large as apes. They are diurnal and range throughout Africa. On all fours, they measure about a yard long; standing, they can reach 4' in height.

Baboons have a well-organized social structure; they live in troops of 20 to 50 members. Each troop has a definite territory over which it ranges. Its members never wander far from the

rest of the troop. When traveling, the females and young stay in the center of the troop, where they are protected from all sides. When at rest, the troop will post sentries to warn of approaching danger. If threatened, the troop will flee, with the males hanging back to protect the females and young from any pursuers.

Unlike most monkeys, baboons are omnivores, and have been known to attack lone humans. Leopards and lions are their greatest enemies. The troop will seek safety from them in trees and rocks, from which they will bark their defiance. The males are quite courageous and will sometimes turn on their enemies; several are more than a match for any predator.

They attack by grappling and biting in close combat. Their vicious canine teeth do 1d-2 cutting damage.

Theropithecus is a larger baboon, growing up to 4' long. It has a shorter face than the modern baboon, a crested skull, and powerful jaw muscles; it bites for 1d cutting damage, and competed for food with australopithecines. Its descendants survive today as *T. gelada*, the Gelada baboon of the mountains of Ethiopia.

Caribou and Reindeer

ST: 20-25 **Speed/Dodge:** 12/7 **Size:** 3
DX: 15 **PD/DR:** 1/2 **Wt:** 500-700 lbs.
IQ: 4 **Damage:** 1d+1 imp#
HT: 14/13-16 **Reach:** C **Habitats:** A, P
Time: Pliocene – Present
Range: Asia, Europe, N. America

Caribou and reindeer belong to the same species. Caribou are found in North America and Siberia, while reindeer are found in Scandinavia and Greenland. Treat the two as being identical.

Caribou are the only members of the deer family in which both sexes have antlers. The largest caribou are about 8' long, standing 5' at the shoulder. They live in large migratory herds of up to 3,000, and are active during the daylight hours, although they can be active at night during the long Arctic winters. They are shy of humans, but are quite inquisitive. They can be dangerous during the mating season (fall), when the males will attempt to drive off any intruders.

Deer and caribou formed a major part of the diet of Cro-Magnons, unwillingly providing more than 90% of the meat eaten in some communities. In others, the figure is closer to 30%, with most of the remainder coming from mammoth, horses and aurochs.

Cuvieronius

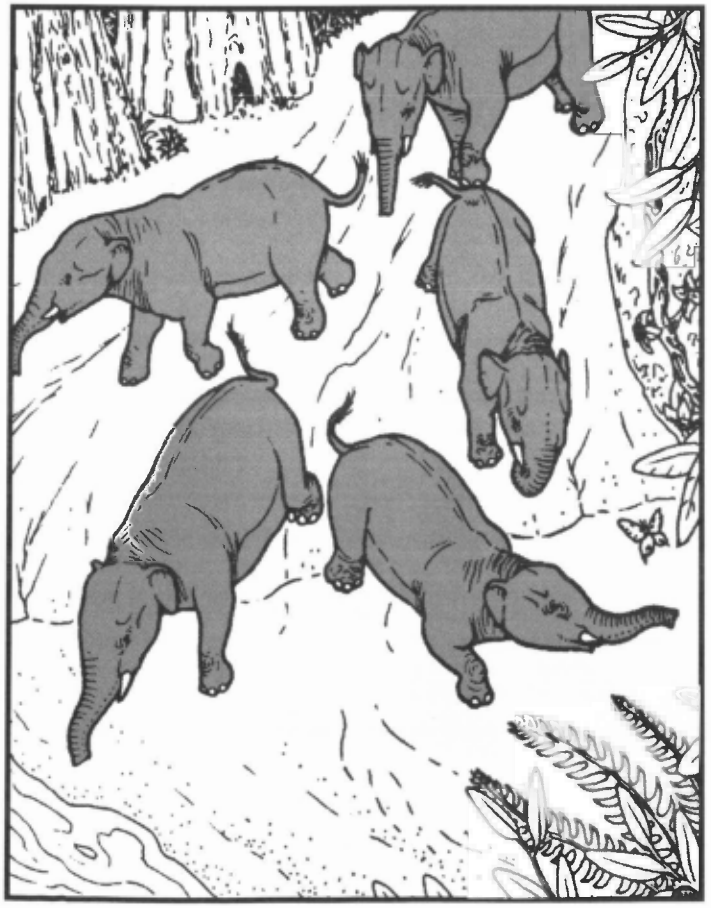
ST: 150-170 **Speed/Dodge:** 8/0 **Size:** 9
DX: 12 **PD/DR:** 1/2 **Wt:** 2-4 tons
IQ: 4 **Damage:** 3d+2 imp#
HT: 17/25-35 **Reach:** C, 1 **Habitats:** M, P
Time: Late Miocene – Recent (5 mya-1,600 ya)
Range: N. and S. America

Cuvieronius is a small elephant, only 9' high at the shoulder. Its tusks are 4' to 5' long, and spirally twisted like a narwhal's. They do 3d+2 impaling damage with Reach 1 and no penalty to hit; it can also trample for 3d crushing damage. It emigrated into South America early in the Pleistocene, and was hunted to extinction by about 400 AD.

Deinotherium

ST: 275-300 **Speed/Dodge:** 8/0 **Size:** 13
DX: 11 **PD/DR:** 2/2 **Wt:** 7-10 tons
IQ: 4 **Damage:** 3d cr#
HT: 17/50-60 **Reach:** - **Habitats:** F, P
Time: Miocene – Early Pleistocene (22-2 mya)
Range: Africa, Asia, Europe
Discovered: 1829

Deinotherium is a large elephant, up to 13' high, with downward-curving tusks in its lower jaw. These were used for digging roots, and are of no use in combat. *Deinotherium* can trample for 3d crushing damage, or strike with its trunk for 1d crushing. The special trampling damage rules can apply here (see p. 32). Treat it as an elephant in all other respects.



Bones of deinotheres, split with stone tools, have been found in Olduvai Gorge. It is unlikely that *Homo habilis* could have hunted anything so large, so they are probably scavenged.

Diprotodon

ST: 40-50 **Speed/Dodge:** 6/6 **Size:** 4
DX: 12 **PD/DR:** 2/2 **Wt:** 1-2 tons
IQ: 3 **Damage:** 1d+2 cr
HT: 15/44-55 **Reach:** -# **Habitat:** P
Time: Pleistocene (2 mya-15,000 ya)
Range: Australia **Discovered:** 1870

Diprotodon is a defenseless, small-brained marsupial the size of a rhinoceros. It is gregarious, grazing in large herds, and is easy prey for human hunters and dogs. Its only defense is to trample, for 1d+2 crushing damage.

Dwarf Elephant

ST: 20-25 **Speed/Dodge:** 6/5 **Size:** 2
DX: 10 **PD/DR:** 1/1 **Wt:** 400-500 lbs.
IQ: 4-5 **Damage:** 1d-2 cr#
HT: 10-13 **Reach:** - **Habitats:** M, F, P
Time: Late Pleistocene
Range: Asia, Europe

Dwarf elephants live on islands which are too small to support full-sized elephants or any large predators. One species that lived on islands in the Mediterranean resembled a modern Indian elephant, complete with tusks, but stood barely 3' high. If threatened, it tramples for 1d-1 crushing damage. Its trunk has ST 5, and can strike in close combat for 1d-5 crushing. There is no evidence that they were ever domesticated.

Eland

ST: 32-40 **Speed/Dodge:** 16/8 **Size:** 3-4
DX: 14 **PD/DR:** 0/0 **Wt:** 1,500-2,000 lbs.
IQ: 4 **Damage:** 1d+2 imp#
HT: 13-16 **Reach:** C **Habitat:** P
Time: Pliocene (5 mya) – Present
Range: Africa

The eland is a large antelope, standing 6' at the shoulder, measuring up to 13' long, and weighing as much as a ton. It has a short muzzle, sharp hooves and long twisted horns, and is light brown in color with a white underbelly. It can be caught and domesticated, and provides an excellent source of milk and meat. It is the favorite prey of early *Homo erectus* in Africa.

Elands are diurnal, and live in herds of 20 to 100. They are capable of jumping more than 7' high, and will sometimes jump over each other in their attempts to flee from danger.

If brought to bay, the eland's horns make it quite dangerous – it can impale for 1d+2 impaling damage. The eland can also trample for 1d+1 crushing damage.

Elephant

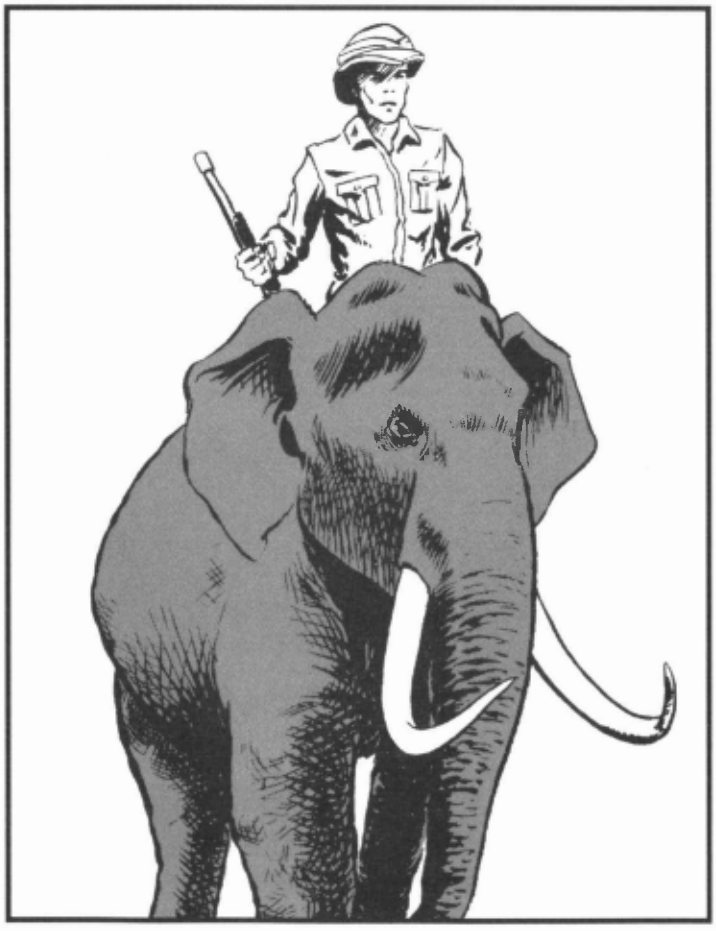
ST: 250-300 **Speed/Dodge:** 8/0# **Size:** 10+
DX: 12 **PD/DR:** 1/2 **Wt:** 5-8 tons
IQ: 6 **Damage:** 3d cr#
HT: 17/40-50 **Reach:** C, 1, 2 **Habitats:** F, P, J
Time: Middle Pleistocene (1.2 mya) – Present
Range: Africa, Asia, Europe

During the interglacials of the Pleistocene, large elephants (up to 12' at the shoulder) roamed the woodlands of Europe. During the Ice Ages, the elephants retreated to the warmth of Africa and Asia, leaving Europe to the mammoths, which are better suited to cold weather.

Elephants are intelligent, and, when domesticated, hard-working. Their patience is well-known, and they will bear a lot of abuse before rebelling. In the wild, they are found in herds of 15 to 30 animals, often covering great distances in their seasonal migrations. They are known to help each other escape from hunters and pits, healthy ones supporting a wounded one on either side or digging a ramp out of a pit with their tusks. Elephants consume about 500 lbs. of vegetation a day, and can travel more than 12 miles a day in search of water.

Elephants attack by trampling for 3d crushing damage, or with their trunks, which can reach up to 2 hexes and have ST 12 – treat the trunk as two-handed for lifting, carrying, throwing, etc. (see *Lifting and Moving Things*, p. B79). The special trampling damage rules can apply here (see p. 32). The trunk may strike (1d crushing) or grapple, and can be used to pick up and hurl things – double the trunk's ST for determining distance. Use the rules for Throwing (p. B80) and Falling (p. B114) to determine the results. Captive bull elephants kill an average of one zookeeper per year.

Elephants have no Dodge, except for their trunks which Dodge at 6. Their thick skulls have DR 4. A domesticated elephant will not carry more than Medium encumbrance (10 × ST) on its back.



Hipparion see p. 69

Hippidion

Time: Pliocene – Late Pleistocene (5 mya-8,000 ya)
Range: S. America **Habitats:** M, F, P

Hippidion is a small horse, up to 4'6" high at the shoulder. Use *Hipparion* statistics.

Hippopotamus

ST: 100-125 **Speed/Dodge:** 6/4 **Size:** 10
DX: 8 **PD/DR:** 2/3 **Wt:** 3-5 tons
IQ: 4 **Damage:** 5d cut
HT: 16/32-40 **Reach:** C **Habitats:** FW, S
Time: Late Miocene (10 mya) – Present
Range: Africa, Asia, Europe

Hippopotamus translates as "river horse," though it bears little resemblance to a horse and is more closely related to pigs. It rivals the rhinoceros as the second-largest living land animal, reaching up to 14' in length, standing almost 5' tall at the shoulder, and weighing about four tons (2d+1 trampling damage). It spends most of its day in the river or basking on the river bank. It can remain submerged for as long as five minutes at a time.

Hippopotami live in schools numbering from 20-100 animals. The females and young occupy a central area, while each adult male is positioned in a separate area (known as a refuge) around the perimeter of the territory. Each male has his own marked path from his refuge to the central feeding area. Hippo schools are matriarchies, run by the females almost as a committee.

Hippos are fiercely territorial; they will chase other creatures away from their haunts, and frequently attack boats passing through. Their mouths are equipped with long, razor-sharp tusks averaging 2½' long, and their slashing bite does 5d cutting damage – enough to crush a small boat or shred an inflatable raft. Hippos fight to kill, as though they had the Bloodlust disadvantage, and are responsible for half of native human deaths in their territory – far more than crocodiles. Strangely, hippos allow crocodiles and freshwater sharks into their refuges, making hippo territory even more dangerous to enter.

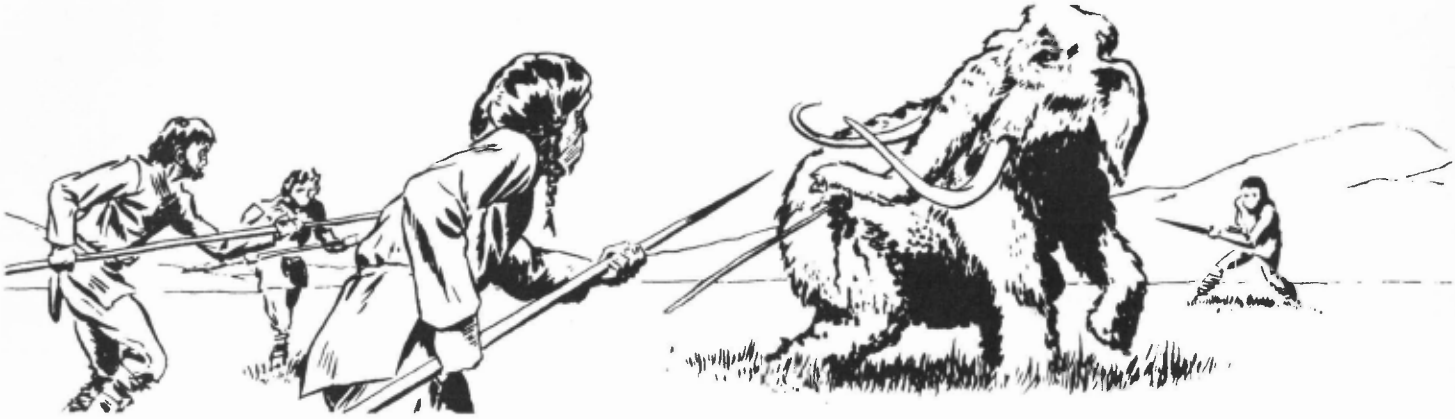
Hippos are herbivores, coming ashore at night to feed. They can wander up to 20 miles in search of food, and often destroy crops. Anyone standing in the path of a hippo returning to a river, or between a cow and her calf, will be trampled or worse.

Large hippos lived in the swamps and rivers of Europe and Asia until about 12,000 years ago. They are indistinguishable from modern 14' hippos, except for extremely prominent, periscope-like eyes which gave them excellent peripheral vision.

Dangerous as they are, hippos are a keystone species, as essential to the ecology of their home as American alligators are to theirs.

Horse (Equus)

ST: 25-30 **Speed/Dodge:** 9/6 **Size:** 1
DX: 12 **PD/DR:** 1/1 **Wt:** 500-700 lbs.
IQ: 5 **Damage:** 1d+1 cr#
HT: 15/20-30 **Reach:** C, 1 **Habitat:** P
Time: Pliocene – Middle Pleistocene (4-1 mya)
Range: N. America, Asia, Africa, Europe



The horses of the Pleistocene are smaller than their modern counterparts, being on a par with ponies (earlier horses are even smaller). In general, they resemble unstriped zebras, with shorter necks and more bristly manes than modern thoroughbreds. They behave like most herd animals, and will flee from danger with the dominant males hanging back to defend the rest if necessary. Horses can kick into any front or rear hex for the listed damage, or bite in close combat for 2 dice crushing damage.

Ibex

ST: 8-12 **Speed/Dodge:** 9/6 **Size:** 1
DX: 13 **PD/DR:** 0/1 **Wt:** 50-100 lbs.
IQ: 4 **Damage:** – #
HT: 15/6-10 **Reach:** C **Habitat:** M
Time: Pleistocene – Present
Range: Europe

Medium-sized herbivores, ibex live in craggy hills and mountains of Europe. They are frequent prey of early hunters. Like goats, a whole herd of ibex can live on land that would barely support one cow.

Ibex are extremely wary, and will flee if approached. If brought to bay, an ibex will butt, then flee if there is a way out. Treat the butt as a slam attack for no damage unless the victim rolls a critical failure on his ST roll; in case of a critical failure, he takes 1d-2 crushing damage. Give the ibex +2 ST for determining knockdown.

Irish Elk (Megaloceros)

ST: 24-30 **Speed/Dodge:** 10/6 **Size:** 3
DX: 12 **PD/DR:** 1/1 **Wt:** 700-1,000 lbs.
IQ: 4 **Damage:** 1d+2 imp
HT: 14/13-16 **Reach:** C **Habitats:** P, S
Time: Late Pleistocene – Recent (.6 mya-2,500 ya)
Range: Asia, Europe **Discovered:** 1803

The Irish Elk is not an elk, but the largest deer that ever lived. It ranged all over Europe and Asia, from Britain to China. Eight feet long, it stood 6' at the shoulder and had enormous antlers, with spreads up to 12' (weighing over 100 lbs.) being common. Like modern deer, it probably shed its antlers annually. It may have died out in Central Europe as recently as 500 B.C., and humans were probably a leading cause of its extinction.

Like all deer, Irish elk are undoubtedly shy of humans, but may have been dangerous in the fall, their mating season. They tend to be solitary, but often group together during the mating season and winter. They are active both day and night. They can do 1d+2 impaling damage with their antlers, or 1d+1 trampling damage with their hooves.

Mammoth

ST: 300-350 **Speed/Dodge:** 8/0# **Size:** 13+
DX: 12 **PD/DR:** 1/2 **Wt:** 7-10 tons
IQ: 4-5 **Damage:** 3d cr#
HT: 17/40-50 **Reach:** C, 1, 2 **Habitats:** P, F, A
Time: Early Pleistocene – Recent (2 mya-10,000 ya)
Range: Asia, Europe, N. America
Discovered: 1803

Mammoths resemble modern Indian elephants with huge curved tusks, up to 17' long, and range in size from 9' to 15' tall. The statistics above are for the largest species, which lived in central Europe; for smaller species, use mastodon statistics, below.

Mammoths are covered with long black hair, which fades to rust-colored after a few thousand years of freezing. They had a thick fatty layer under their skins, and small humps of fat, like those of a camel, behind their domed heads. They were extensively hunted by Cro-Magnon and Neandertals; their fur and bones were used for making huts, and their ivory for jewelry and works of art. There is no evidence that they were ever domesticated.

If threatened, mammoths attack by trampling for 3d crushing damage. The special trampling damage rules can apply here (see p. 32). Treat them as elephants in all respects not covered here.

Mastodon (Mammut)

ST: 175-200 **Speed/Dodge:** 8/0 **Size:** 10
DX: 12 **PD/DR:** 2/2 **Wt:** 3-5 tons
IQ: 4 **Damage:** 3d cr#
HT: 17/30-40 **Reach:** C, 1, 2 **Habitat:** F
Time: Late Miocene – Recent (11 mya-8,000 ya)
Range: N. America

Mastodons have long curved tusks and woolly black hair, and browse Pleistocene spruce forests from Alaska to Florida. They are smaller than most mammoths, and also have a more limited habitat. Their teeth are adapted for chewing the soft leaves and twigs of open woodlands, whereas mammoths could deal with the tougher prairie grasses. There is no evidence that they were ever domesticated.

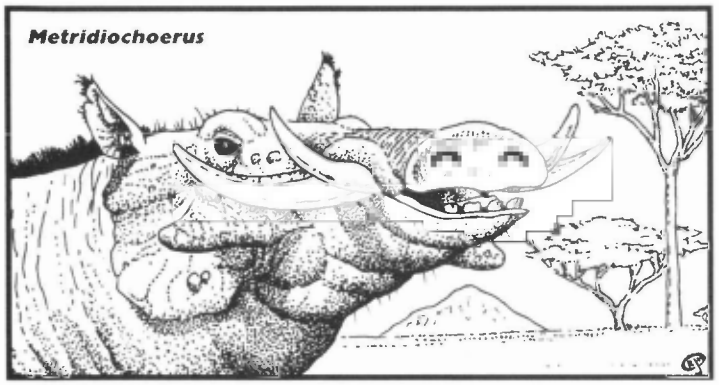
Treat mastodons as small mammoths in all other respects.

Megatherium see p. 69

Metridiochoerus

ST: 20-24 **Speed/Dodge:** 8/7 **Size:** 2
DX: 14 **PD/DR:** 1/2 **Wt:** 250-500 lbs.
IQ: 4 **Damage:** 2d-1 cut
HT: 15/20-25 **Reach:** C **Habitat:** P
Time: Late Pliocene – Early Pleistocene (3-1 mya)
Range: Africa

Metridiochoerus is an omnivorous giant warthog with huge curved tusks, which gore for 2d-1 cutting damage. It grew up to 5' long, and shares the African savannah with *Homo habilis* and *Homo erectus.*



Pelorovis

ST: 60-75 **Speed/Dodge:** 8/4 **Size:** 3-4
DX: 9 **PD/DR:** 1/1 **Wt:** 1,500-2,500 lbs.
IQ: 4 **Damage:** 2d cr#
HT: 13-16 **Reach:** C-3 **Habitats:** P, F, S
Time: Middle – Late Pleistocene (1 mya-12,000 ya)
Range: Africa

Pelorovis is a close relative of the modern Cape buffalo, one of the most dangerous game animals alive. It is ten feet long, and its huge downward-curving horns have a span of more than seven feet – possibly as wide as 13 feet.

Pelorovis males protect their herds by charging and trampling. Their head butts do 2d crushing damage with up to 3-hex reach on either side; their trample does 1d+1 crushing damage.

Rhinoceri

Elasmotherium

ST: 300+ **Speed/Dodge:** 10/5 **Size:** 13
DX: 9 **PD/DR:** 3/4 **Wt:** 3-5 tons
IQ: 4 **Damage:** 3d+2 cr
HT: 17/60-75 **Reach:** C, 1, 2 **Habitat:** P
Time: Oligocene – Late Pleistocene (38 mya-50,000 ya)
Range: Asia, Europe **Discovered:** 1809

Modern Rhinoceros

ST: 125-150 **Speed/Dodge:** 14/7 **Size:** 10
DX: 9 **PD/DR:** 2/3 **Wt:** 1-2 tons
IQ: 4 **Damage:** 2d+1 cr#
HT: 17/40-50 **Reach:** C **Habitats:** P, J
Time: Late Miocene (11 mya) – Present
Range: Africa, Asia

Woolly Rhinoceros (Coelodonta)

ST: 120-150 **Speed/Dodge:** 13/6 **Size:** 10
DX: 11 **PD/DR:** 3/3 **Wt:** 1-2 tons
IQ: 4 **Damage:** 2d+1 cr#
HT: 17/40-48 **Reach:** C, 1 **Habitats:** A, P
Time: Pliocene – Recent (5 mya-8,000 ya)
Range: Europe

Rhinoceri are thick-skinned, near-sighted (Vision 9, Smell and Hearing 16) browsing herbivores. Their "horns" are made of thick hair, and not attached to the bone at all. Legend to the contrary, these horns have no aphrodisiac properties (at least, not in low-mana areas). Rhinos first appeared in the Oligocene, and thrived throughout the northern hemisphere; they became extinct in North America 5 million years ago, and declined elsewhere during the Pliocene.

Rhinos are most active in the morning and evening. Most species are solitary – apart from the gregarious white rhino, which travels in groups of three or four. They are not aggressive, and will usually flee predators: occasionally, though, they will charge, either impaling with the horn or trampling. They have difficulty hitting moving targets, and if they miss their intended victim, they will often forget it immediately – unless their young are endangered.

Elasmotherium is an extinct genus of woolly rhinoceros, much larger than any modern rhino – seven yards long, and standing 13' tall at the shoulder! Its horn alone is over two yards long, and does 3d+2 crushing damage with a 2-hex reach; it tramples for 2d+1 crushing damage. It is a solitary animal, active from dawn to dusk, and unafraid of almost everything.

The modern black and white rhinos of Africa are the most numerous species today, with most Asian rhinos either extinct or seriously endangered. The black rhino is about 12' long and stands up to 6' at the shoulder; white rhinos stand slightly higher. Their horns do 2d+1 crushing damage, and they trample for 1d+2 crushing. Asian rhinos are smaller, with smaller horns but thicker hides (PD 2, DR 4), and live in jungles or forests.

Coelodonta (woolly rhinos) commonly figured in prehistoric cave art. They are about the same size as modern rhinos, but covered with long shaggy fur. The woolly rhino is a solitary animal, probably active during the day. Treat it as a modern rhino in all other respects.

Sivatherium

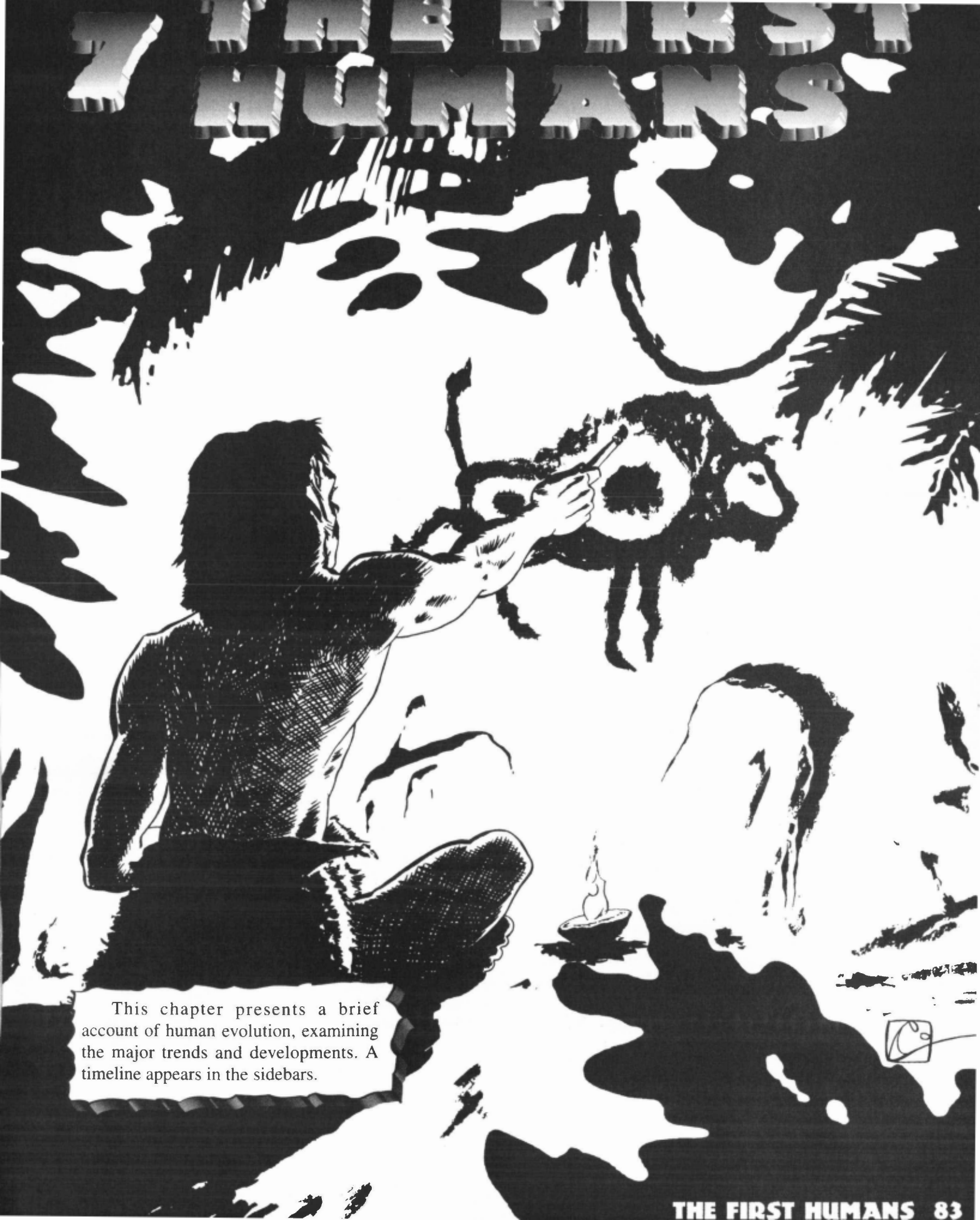
ST: 40-50 **Speed/Dodge:** 12/6 **Size:** 3
DX: 13 **PD/DR:** 1/2 **Wt:** ¾-1 ton
IQ: 4 **Damage:** 1d+2 cr#
HT: 15/16-20 **Reach:** C **Habitats:** M, F, S
Time: Pliocene – Recent (5 mya-8,000 ya)
Range: Africa, Asia **Discovered:** 1836

Sivatherium resembles a moose, 7' to 10' high at the shoulder and heavily built, with huge branching horns. It is actually related to giraffes, and its bones, split for eating by *Homo habilis*, have been found in Olduvai Gorge.

Sivatherium do 1d+2 crushing damage with their antlers, or 1d+1 trampling damage with their hooves.

Toxodon see p. 70

7 THE FIRST HUMANS



This chapter presents a brief account of human evolution, examining the major trends and developments. A timeline appears in the sidebars.

TIMELINE OF HUMAN EVOLUTION

7,000,000 B.C. – The line which will eventually produce man branches off from that of the chimpanzee and gorilla.

5,000,000 B.C. – *Ardipithecus ramidus,* thought to be a direct ancestor of modern man, appears in Africa.

4,500,000 B.C. – *Australopithecus anamensis,* an intermediate hominid, appears in Africa.

4,000,000 B.C. – *Australopithecus afarensis* appears in east Africa.

3,000,000 B.C. – *A. africanus* arises in southern Africa.

2,500,000 B.C. – *Paranthropus* appears – *P. robustus* in southern Africa, *P. boisei* in eastern Africa. The first lithic (stone) technology, consisting of pebble tools, is invented.

2,000,000 B.C. – The Pleistocene Epoch begins. Date of the oldest known *Homo habilis* fossils.

1,750,000 B.C. – First bone point is made.

1,650,000 B.C. – *Homo ergaster* first appears in Africa.

1,500,000 B.C. – *H. habilis* becomes extinct. The Acheulean tool industry begins to develop and the first hand axe is used. First opportunistic use of naturally occurring brush fires occurs.

1,000,000 B.C. – *H. erectus* spreads into Europe and Asia. Cooperative hunting among hominids begins. The spear is invented, and simple language begins to develop.

800,000-700,000 B.C. – The Gunz glacial period in Europe begins. First known hearth fires were used at sites in northern China: fire probably started naturally, but was maintained by humans. Cooked food and intertribal cooperation begin.

550,000-330,000 B.C. – The Mindel Ice Age in Europe begins. The baton technique of tool making is invented. Humans learn to make fire, the first bone tool kit, and simple clothing.

300,000 B.C. – *Homo heidelbergensis* appears; *erectus* becomes extinct.

280,000-130,000 B.C. – The Riss Ice Age begins in Europe. True spoken language and animistic beliefs begin to develop.

200,000 B.C. – The theoretical "Eve," common female ancestor to all modern humans, is born. The Levallois tool making technique is invented and gives rise to Mousterian tool industry.

Continued on next page . . .

The story of mankind's origin begins in earnest around seven million years ago. At that time, the evolutionary branch which eventually produced modern humans split off from the line which includes the chimpanzee and the gorilla. This first hominid (the term "hominid" applies to all of the members of the genera *Homo* and *Australopithecus*) was a diminutive creature, standing no more than four feet tall. It walked upright, most likely with a bow-legged, swaying gait, and traveled in small roving bands, living mostly off plants with occasional meals of scavenged meat.

The earliest known and most primitive hominid was *Ardipithecus ramidus.* It appeared about 5 million years ago, and is thought to be ancestral to all later hominids.

The first known australopithecine was *Australopithecus anamensis.* Next was the better-known *A. afarensis,* a small, nimble inhabitant of the savannahs of east Africa which lived about 3.5 to 4 million years ago. *A. africanus,* which evolved from *afarensis*, was very similar but lived primarily in southern Africa.

Their more robust contemporaries *Paranthropus robustus* and *Paranthropus boisei* were much larger, often reaching six feet or more in height. They had massive jaws and barrel chests, and both may have been merely regional variations of a single wide-ranging species. Male australopithecines were up to twice the size of females.

The australopithecines used twigs to fish for termites and dig for edible roots, and picked up convenient rocks to smash bones to get at the marrow. Modern chimps display similar tool-using behavior. Australopithecines did not, however, create stone tools of a regular pattern: tools found near *boisei* bones were probably made by *Homo habilis,* and used for butchering the australopithecines.

With brains only a third the size of a modern human's, australopithecines were only slightly above the rest of the animal kingdom in intellect, and were more often prey than predator.

THE GENUS *HOMO*

Homo habilis

Homo habilis, the first representative of the genus which includes modern humans, became distinct as a species from *A. afarensis* two to two and a half million years ago. Very little is known of *habilis,* since very few fossilized remains have been discovered. Enough evidence has been found to determine that the "handy man" – a rough translation of the Latin scientific designation – was a small, stocky creature that walked upright. He had a low forehead and a strong lower jaw, still well adapted to the life of a vegetarian gatherer. Females were only 15-20% smaller than males. *H. habilis* had a brain capacity half that of modern man, and, for the first time ever, he made stone tools. Many sites of *habilis* remains include pebble tools – chopping instruments made by knocking three or four flakes off of a smooth, round rock, to give it a sharp edge.

These tools enabled *habilis* to butcher large animals (including australopithecines and giants such as *Deinotherium*) and include fresh meat as a regular part of his diet.

Homo ergaster and *Homo erectus*

Not quite a million years after his appearance, *habilis* was replaced by *Homo ergaster,* perhaps the first true human. *H. ergaster* was larger, robust in build, and had a prominent brow ridge that distinguished him from humans today. But *H. ergaster* was the first creature in earth's history to use and make fire, cook his food, and wear clothing. *Homo ergaster* evolved into the very similar *Homo erectus,* who spread throughout much of the world.

Technology advanced rapidly during *H. ergaster* and *H. erectus'* 1.3-million-year tenure. They learned to make razor-sharp hand axes, invented the spear (and the technique of hardening spear points in a fire), and made the first tools from bone. Many of the advances were responses to a cooling environment, as glaciers encroached on the northern hemisphere and the Riss Ice Age began.

All of the achievements of *H. ergaster* and *H. erectus* are directly attributable to their larger, more complex brains. At 1,000 milliliters, they were within the modern human range, though still 25% smaller than the average. For the first time there was an animal capable of truly abstract thought. *H. ergaster* could envision an object that would be useful, one that he had never seen and that had never existed, and create it from materials found in his environment. His creativity and ability to look into the future made it possible for him to plan ahead and organize cooperative group hunts. Along with this cooperation came the development of language and, eventually, the beginnings of culture.

Homo heidelbergensis

Homo heidelbergensis (formerly known as "archaic *Homo sapiens*") evolved as *H. erectus* died out, 300 thousand years ago. By this time, hominids had spread from Africa throughout temperate Europe and Asia, thanks to the development of technologies which allowed them to survive in cooler climates (fire

TIMELINE OF HUMAN EVOLUTION (CONTINUED)

150,000-125,000 B.C. – Neandertal man arises in Europe. Burial of the dead begins. *Homo sapiens* appears in Africa, and begins taking over from the archaic form.

90,000 B.C. – *H. sapiens* migrates into the Middle East, Asia, and Australia.

75,000-10,000 B.C. – The Wurm Ice Age occurs in Europe.

50,000 B.C. – Totemism begins to develop.

45,000 B.C. – *H. sapiens* migrates into Europe.

32,000 B.C. – Neandertals disappear, quite suddenly in evolutionary terms.

30,000 B.C. – The "Age of Art" begins. First humans in Japan.

15,000 B.C. – The magnificent cave paintings of Lascaux are created. Humans migrate over the Bering land bridge to North America.

12,000-10,000 B.C. – Glaciers recede. Reindeer, horses, cattle and dogs are domesticated.

10,000 B.C. – Agriculture is invented. This is the beginning of the modern era – the Holocene.

RELIGION

Religious beliefs are unique to *Homo sapiens* and *Homo neanderthalensis*. Although *Homo erectus* understood symbolism well enough to have a kind of primitive language, he had no real religion. *H. sapiens* developed religious systems based on animism and, later, totemism. These are described in the sections about each species in this chapter.

The most important aspect of early religious practices is their communal nature. All of the rituals fulfill crucial social and practical functions, as well as philosophical ones. A tribe practices its religion together, in public. The religion justifies the social order and defines proper behavior. Primitive man took his religion very seriously, and so should the PCs. Religion is a vital part of the social structure which enhances *Homo sapiens*' ability to survive.

and clothing). Now, humankind moved even farther north, into the arctic conditions near the great glaciers. The challenges of life in these even more hostile climes were met with new strategies for survival. Culture itself became man's most important adaptive tool.

H. heidelbergensis had a well-ordered society. The trend toward specialization and division of labor which began with *H. erectus* continued. Each group within a band – adult men, women, adolescents and children – had a specific role to play in the daily fight for survival. Human society began to develop mechanisms to reinforce the social organization which was vital to a tribe's existence. Animistic beliefs, ethics, storytelling and group rituals all probably had their origins with *H. heidelbergensis*. Alongside these, a true spoken language developed.

Neandertal Man

When Neandertal man (*Homo neanderthalensis*) appeared in Europe, technological and cultural evolution accelerated. Despite their powerful build, large jaw and beetle brow, Neandertals were an intelligent, creative species. They invented new methods of working with stone which resulted in even more efficient tools and weapons. New tools, used only in the manufacture of other items, represented another leap in ability for abstract thought. Now humans could build up complex sequences of cause-and-effect relationships. These relationships were reflected in the culture. More complex religious beliefs are indicated by the first known ritual burials, practiced by Neandertals. Neandertals cared for their own kind; there are known remains of individuals who survived for years after being completely crippled by disease or injury. Animistic beliefs were probably an integral part of Neandertal society.

Cro-Magnon Man

The last major glaciation of Europe, called the Wurm, saw the advent of modern humans. *Homo sapiens sapiens* – called Cro-Magnon for the place where their remains were first discovered – had an advanced technology and a thorough understanding of their environment. Cro-Magnons invented the spear thrower, needle, sled, canoe and net. They observed the cycles of the moon and the seasons, kept track of them, and related them to the life cycles of the animals on which they depended for survival. They found plants that could help cure illnesses, learned how to stitch up wounds, and practiced healing magic.

The *H. sapiens* of 30,000 years ago were as culturally sophisticated as humans today. They practiced complex animistic and totemic religions; these belief systems explained the world around them, addressed the phenomena of birth and death, and incorporated the social bonds of marriage, kinship and tribalism. And they expressed themselves artistically, creating vast cave paintings, sculpture, engravings and tattoos.

ECONOMY

The economy of a stone age tribe is based entirely on barter. Although there is no currency, a measure of the relative value of certain items is helpful. This book discusses the value of items in terms of "$kins," represented by a $. It is not intended that characters should start throwing around rabbit pelts as if they were gold pieces; this would be inaccurate as well as ridiculous. The values are assigned merely for comparison. A list of common items and their relative val-

ues is provided on pp. 113-114. A set of general guidelines for determining values of objects not listed is given below. The GM should use these as he sees fit – if he doesn't want an item to be available to the players, he may disallow it, or increase its value significantly.

In general, a $kin represents an hour of safe, simple labor. Thus, a very simple object which required one hour to find or make would be worth one $kin. A number of other factors have a bearing on an item's value, however. The skill required to make an object, the rarity of the materials, difficulty in making it, market demand, and any danger associated with acquiring it, all play a role. It is up to the GM to determine exactly how much these factors affect the "cost" of an item.

Example: A Cro-Magnon PC might want to trade for a spear thrower. An ordinary spear thrower might take three hours to make, and although the skill to make it isn't possessed by just anybody, it's not uncommon among Cro-Magnon tribes. So the average thrower is worth about 4 $kins. This particular weapon, however, is carved from the femur of an albino cave lion – a rare thing and very hazardous to obtain! So the GM might double or even triple the weapon's value. It is also engraved with images of reindeer, making it worth even more. Thus, the PC might have to trade possessions worth a total of 10 or even 15 $kins to get the spear thrower – more if he is a poor haggler.

Note that the rarity of an item or the skill to make it will vary with the setting of the campaign. A bone needle would be valuable to Cro-Magnon, priceless to a Neandertal, and totally worthless to a *H. habilis* unable to understand its function.

TECHNOLOGY

In the stone age world, there is no such thing as worked metal, although a shapeless lump of shiny gold ore might be strung on a cord for a necklace. Fire, the lever, and tools made from stone, wood and bone represent the extent of traditional technology. The specific level of technological achievement for each race is outlined in the *Character Creation* section, p. 88.

The tech level of some Ice Age peoples exceeds 0 in medicine. Most anthropologists believe that Neandertal and Cro-Magnon man had some knowledge of herbal medicines, and may have practiced rudimentary first aid, including stitching up wounds and very minor surgery. In the area of medical technology these peoples are TL1.

LANGUAGES

There is no way to guess the form of any language spoken by man's ancestors. It is thought from the fossil evidence that the australopithecines and *H. habilis* did not have the physical ability to produce much more than grunts and

PSIONICS AND MAGIC

Psionic powers are not a part of the "caveman" genre, with the exception of a few latent advantages like Danger Sense (see p. B20) and Racial Memory (see p. 109).

Magic, on the other hand, is an important part of all modern hunter/gatherer cultures, and this was almost certainly true in the Pleistocene. In general, the practice of magic in stone age societies is called *shamanism*. Shamanism is not specifically religious, but it exists within the world view defined by the religion, and is explained by it.

The powers of a shaman come from his ability to manipulate spirits and act in the spirit world which exists in animistic belief. Whether or not these spirits are real is up to the GM; this in turn determines whether or not shamanistic magic will work. Just because magic doesn't work doesn't mean there won't be shamans. They might be mere charlatans, or skilled herbal healers, or true believers. Of course, the GM need not tell the players how he's chosen to play it . . .

See p. 111 for a more detailed discussion of shamans.

H. HABILIS HEIGHT AND WEIGHT TABLE

This table works just like the table for humans on p. B13. Height is determined by ST; weight is based on height.

ST	*Height*	*Weight*
4 or below	4'8"	90 lbs.
5	4'9"	95 lbs.
6	4'10"	100 lbs.
7	4'11"	105 lbs.
8	4'11"	105 lbs.
9	5'	110 lbs.
10	5'	110 lbs.
11	5'1"	115 lbs.
12	5'1"	115 lbs.
13	5'2"	120 lbs.
14	5'3"	125 lbs.
15 or above	5'4"	130 lbs.

HEIGHT AND WEIGHT MODIFICATIONS

For *H. habilis* characters who are not of exactly average height and weight for their ST, consult the table below. Always apply modifiers to height first; then determine weight; and then modify the weight.

Die Roll	*Modification*
2	-4" or -20 lbs.
3	-3" or -15 lbs.
4	-2" or -10 lbs.
5	-1" or -5 lbs.
6-8	no modifications
9	+1" or +5 lbs.
10	+2" or +10 lbs.
11	+3" or +15 lbs.
12	+4" or +20 lbs.

These tables assume that the character is a male. For female *H. habilis* characters, adjust as for humans – sexual dimorphism is slightly greater for *H. habilis* – by subtracting 2" from average height and 10 lbs. from average weight.

howls. For them, communication was probably accomplished through body language and vocal signals, such as those used by chimps.

Homo ergaster and *H. erectus* had limited vocal abilities, and were certainly intelligent enough to use language. They probably combined simple monosyllables with gestures to communicate. True spoken language, complete with past and future tenses, passive voice, and a large vocabulary did not develop until the appearance of *H. heidelbergensis.* Even then, gestures, sign language and body language continued to be important.

All the tribes of the same species in a large region speak the same language. Different tribes within a region will speak varying dialects, however. A tribesman's default language skill for a similar dialect would be IQ-1 or 2. For a tribe living many miles away, the default might be IQ-3. In general, the more contact between two tribes, the more similar their languages. All Pleistocene languages are Mental/Easy skills.

CHARACTER CREATION

This section gives gaming information and statistics for the various hominid races that flourished during the Pliocene and Pleistocene, including social structure, technology, culture, religion and physical characteristics – everything the player needs to create a single character or an entire tribe. Which hominid species are acceptable as player character races will depend on the time and type of campaign. Check with your GM before creating your character.

PCs for prehistoric campaigns should be built on 100 points. Some hominids have natural advantages or limitations which are inherent to the species. These advantages and disadvantages are figured into the point cost for being a member of that race. Such automatic disadvantages and limitations do not count against the 40-point limit for a PC (see p. B26).

Some skills and advantages are forbidden to certain races – they simply aren't advanced enough. These are listed in the race descriptions. Other skills and advantages aren't available to all characters; these are listed in the *Characters* chapter. Any skill, tool or cultural development discussed in the text on one race may be presumed to be available for all subsequent races.

Homo habilis -40 points

Homo habilis is the oldest representative of the genus *Homo*, to which modern humans belong. *H. habilis* first appeared about 2.3 million years ago, and existed for the better part of a million years. An inhabitant of the savannah of eastern and southern Africa, *H. habilis* lived well before the onslaught of the ice ages which gripped Europe during the Pleistocene.

Advantages and Disadvantages

A *Homo habilis* character starts with ST-1 (-10 points), DX+2 (+20 points), IQ-3 (-30 points), HT-1 (-10 points) and the advantage of Alertness +1 (+5 points), as well as the disadvantages Short Lifespan × 2 (-20 points) and Uneducated (-5 points).

A *H. habilis* character may not take the advantages of Mathematical Ability or Magery, but basic survival skills are a necessity. Taking the Gesture skill is also a good idea. Some skills are inappropriate – the fire-making and religious skills for example. Others, like Stone Knapping (Armoury/TL0; see p. 110), are practiced only at the basic default level. Allowable skills should be determined by the GM and the style of campaign he wishes to run.

H. habilis matured more quickly and died younger than modern man. A *H. habilis* character has normal adult attributes at age 11. A character with the Youth disadvantage must be no more than ten years old. *H. habilis* characters are considered old at age 25, and must begin rolling for attribute loss at that time (see p. B27). At the age of 30, a character must roll for attribute loss every six months, and at 35 every three months.

Physical Appearance

H. habilis was smaller than modern humans, averaging five feet in height and weighing a little over 100 pounds (see sidebar, p. 88). As an adaptation to the African savannah environment, he had dark skin and sparse body hair. The body of *Homo habilis* resembled that of modern man anatomically, having roughly the same proportions. The primary differences lay in the head. The *H. habilis* skull is much flatter than that of *Homo sapiens* and contained a brain only half as large. The lower jaw is proportionally larger, heavily muscled, and supports large molars. The overall effect gives *H. habilis* a more apelike face: a low, sloping forehead, prominent cheekbones, a flat nose, heavy jaw and no chin.

Australopithecine Characters

There are four hominid species in the genera *Australopithecus* and *Paranthropus*, all of which coexisted (if rather uneasily) with *Homo habilis*. These four – *Australopithecus afarensis, A. africanus, Paranthropus robustus* and *P. boisei* – can make interesting character races for a campaign set in the early Pleistocene Epoch.

Both *Australopithecus* and *Paranthropus* species live on the savannahs of eastern and southern Africa. The australopithecines first appear about 3.75 million years ago, and disappear just as *H. habilis* comes on the scene. *Paranthropus* comes from a later period, first appearing around 2.5 million B.C. and disappearing around 1.2 million B.C. after the appearance of *Homo ergaster*.

Australopithecus characters have ST-1 (-10 points), DX+2 (+20 points), IQ-4 (-30 points), HT-1 (-10 points) and Alertness+1 (+5 points). Their life is shorter – about 25 years. Males are about the same size as *H. habilis* (though the australopithecines are hairier), and live in similar family groupings. Females are much smaller – one to two feet shorter, with ST -2 (-15 points) and DX +2 (+20 points). Australopithecines also have the disadvantages of Short Attention Span (-10 points), Short Lifespan × 3 (-30 points) and Uneducated (-5 points). They cannot have Mathematical Ability or Magery, and can never have language skills greater than 8.

They have normal adult attributes at age 10 and must be younger to take the Youth disadvantage. They are considered old at age 20 and must begin rolling for attribute loss. At age 25, they must make a roll every three months and at 30, every month. Being a male *Australopithecus* is worth -70 character points; a female is worth -75.

Paranthropus characters are considerably larger than *H. habilis*, averaging about 5' 6" in height.

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AUSTRALOPITHECINE CHARACTERS (CONTINUED)

They have normal ST, DX+2 (+20 points), IQ-4 (-30 points), HT-1 (-10 points), and Alertness +1 (+5 points). Like the australopithecines, *Paranthropus* characters have the Short Attention Span (-10 points), Short Lifespan × 3 (-30 points) and Uneducated (-5 points) disadvantages. They cannot have Mathematical Ability or Magery. They are almost entirely vegetarian, and have massive jaws and molars. They become adults at age 10 and must be younger to take the youth disadvantage. *Paranthropus* is considered old at age 20 and must begin rolling for attribute loss. Increase rolls to every six months at age 22 and every three months at age 25. The average age of death is 17 years.

Tool use is slightly more advanced; *Paranthropus* individuals make crude choppers and digging sticks. Their social organization is similar to that of *H. habilis*. It is worth -60 points to be a *Paranthropus* character.

Australopithecus and *Paranthropus* are incapable of true speech. They communicate through grunts, simple gestures, and body language. Their maximum language skill is 8. They do not use individual names.

Technology

Homo habilis was the first of the hominids to manufacture stone tools. By banging two rocks together, they created simple tools for cutting and chopping. These tools consisted only of the stones themselves, lacking handles or hafts. *H. habilis* also used tools made from other materials such as bone and wood, especially clubs and digging sticks. They did not construct shelters or wear clothing.

The development of a tool technology allowed *H. habilis* to become the first hominid to utilize big game as a food source. Since hominids lack the sharp canines and incisors necessary to cut and tear meat, tools are required to butcher large animals before consumption. Still, *H. habilis* did not hunt large animals on a regular basis. Instead, he drove other predators away from their kills, or scavenged the carcasses of animals which died of natural causes. He also hunted small reptiles, rodents, frogs and birds. All of these supplement a primarily vegetarian diet.

Homo habilis did not know how to make or control fire. He knew of it, however, since grass and brush fires were frequent in the savannah environment. It is possible that some bands took advantage of such events, ambushing fleeing animals.

Language

The larynx of *Homo habilis* was not developed enough to allow the full human range of sound, but *H. habilis* was capable of limited vocal communication. Short, one and two syllable "words" – essentially grunts, howls and similar sounds – combined with gestures and a well-developed body language, enabled him to communicate. Still, *H. habilis* could not express ideas in any tense other than the present, or abstract concepts such as mathematics. *H. habilis* characters cannot have language skills higher than 8. This is not due to a deficiency in the "language," but in the *H. habilis* brain itself: the first *Homo* is simply not that smart.

H. habilis naming practices are restricted to job titles like hunter, mother, etc. Different persons are indicated by pointing – if the individual is not present, it is impossible to talk about him!

Society and Culture

Homo habilis traveled in small bands of 10 to 30 individuals. Each band consisted of a number of family groups – one or two adult males, up to three adult females, and one or two children per female – totalling five to ten individuals. When food is scarce, a band splits up into component groups which fend for themselves. The band is organized on a fairly egalitarian basis, with no adult holding significant power over any other. Members of the band cooperate in hunting and food gathering, and the food that is brought in is shared by the entire band. There is not much division of labor – each day the band goes out to hunt live game or scavenge meat, gather edible roots, berries, fruit, nuts, vegetables, and catch insects. A mother carries her infant child with her; older children must walk and keep up on their own. The band is nomadic, and moves every few days to find new food sources.

Homo habilis' culture was very limited. They had few if any religious beliefs, and did not practice magic. They may have had at least one taboo, against incest. They were probably not cannibals, but they had no qualms about eating australopithecines. A specific band might have a few other taboos, usual-

ly oriented towards safety, e.g., avoiding a disease-infested swamp or a region of dangerous hot springs and geysers. An individual who violates one of these taboos might be ostracized by the rest of the band for a short period of time. Repeated violations could result in expulsion from the band. The murder of another band member, disease or madness would also result in exile. Given the hostile nature of the environment and the limited toolmaking capacity of *H. habilis,* this fate usually means death unless the exiled individual can find another group to join.

Homo ergaster and *Homo erectus* -40 points

The oldest known specimen of *Homo ergaster* was discovered in Kenya in 1984, and dated at an age of 1.6 million years. *Homo erectus* later spread throughout Europe and Asia; their remains have been found from Spain to Java, and from Johannesburg to Beijing. *H. erectus* was the first hominid species of the Pleistocene Ice Age, and was suitably adapted to more temperate climates than those occupied by *Homo habilis.*

Advantages and Disadvantages

The following modifiers are applied to all beginning *H. ergaster* and *H. erectus* characters: IQ-2 (-15 points), as well as the disadvantages Short Lifespan × 2 (-20 points) and Uneducated (-5 points). Magery cannot be taken by *H. ergaster* or *H. erectus* characters; all other advantages are allowed. As with *Homo habilis,* the list of available skills should be set by the GM, and all skills except shamanic and religious ones are possible. Gesture, Sign Language, Stone Knapping and fire-making skills are all good additions to the basics – Survival and Tracking.

Homo ergaster and *Homo erectus* individuals have a shorter lifespan than do modern humans. They reach physical maturity at the age of 13, and characters with the Youth disadvantage must be twelve or younger. A character is considered old if he reaches 30, and must roll once per year for attribute loss; see p. B27. At 35, he must roll every six months, and every three months if he is 40 or older.

Physical Appearance

Homo ergaster and *Homo erectus* were larger than *Homo habilis,* and had a much more modern appearance. Some African *H. ergaster* males grew to more than six feet tall, with the average height in colder climates (Europe and mainland Asia) being closer to five feet. They were also more robust for their height than men of today. To determine height and weight, use the table for humans (p. B15), subtracting 5 inches and adding 10 pounds. Always determine height first, then weight. Their heads were also more modern, with a cranial capacity approaching that of *Homo sapiens,* but the brow ridges, heavy, chinless jaws, and flat faces still gave them a distinctly nonhuman visage. Their hair and skin were dark: shades of brown or black depending on the environment.

Diet and the Place of Women

These two subjects may seem totally unrelated, but in fact the first has a significant influence on the second.

For all hominids prior to Cro-Magnon man, fruits, vegetables, insects and small reptiles account for 70% of the diet. Nuts, roots, berries and other fruits, insects, grubs, lizards and frogs make up the vast majority of meals. Larger game animals and scavenged meat account for the remaining 30% of the daily diet. A band might go several days without fresh meat.

The women of a band or tribe, who do most of the gathering, provide over 2/3 of the group's food. The mighty hunters, on the other hand, contribute a mere 1/3. This situation gives women substantial influence within the group. Their opinions regarding when and where the band should move are respected, as are their preferences when selecting a specific campsite. Since the women must carry and care for the small children, they need to be able to find a variety of foods near the base camp. The men are free to roam great distances in search of prey, however, so the exact location the camp is of less importance to them.

In later periods, this practical influence is carried over into the developing culture. Women are not treated as slaves or second-class citizens.

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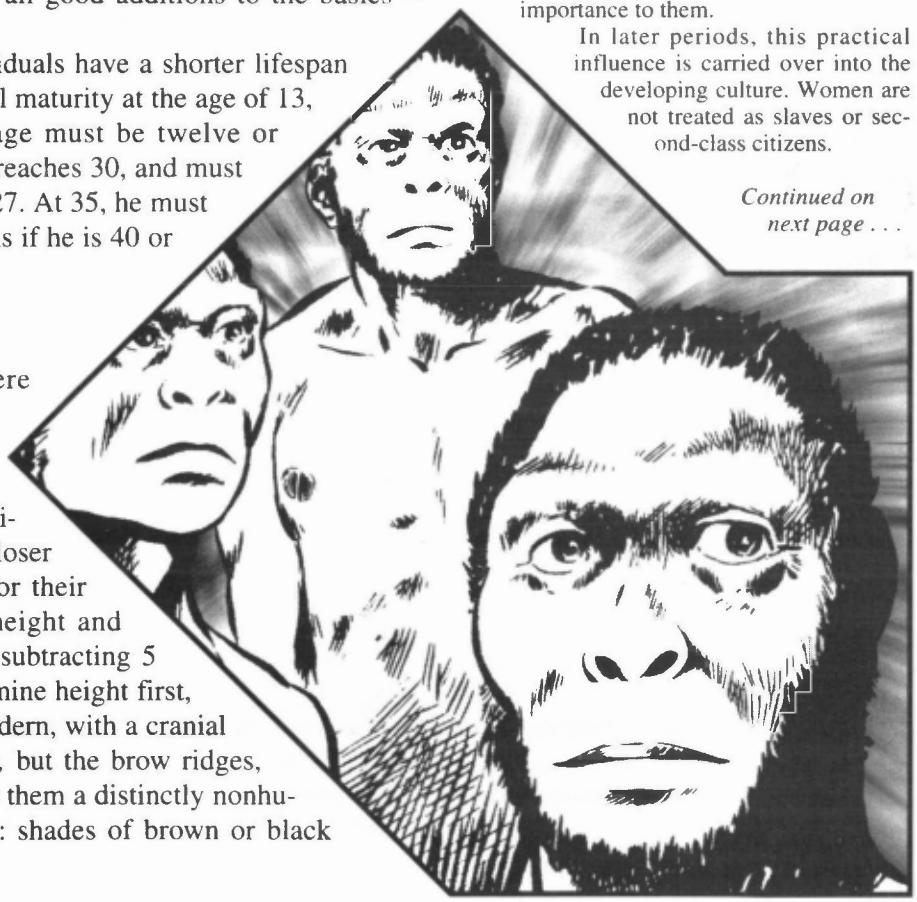
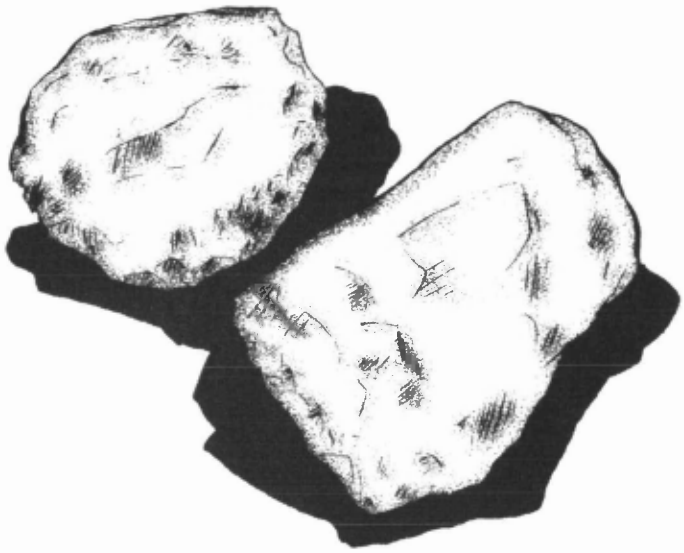




DIET AND THE PLACE OF WOMEN (CONTINUED)

Although they are not leaders – primarily because motherhood restricts their freedom of movement – their advice is taken seriously.

This situation changes as technology makes the hunter more efficient. Cro-Magnon hunters are able to meet a much larger percentage of the tribe's nutritional needs, and the status of women may decline correspondingly. However, the "Venus Cult" artworks (p. 105) suggest that the Cro-Magnons held motherhood in reverence. The GM may assume that a Cro-Magnon woman's status is equal to the number of children she has borne. The same would not be true of men, as they probably had no concept of fatherhood. Female herbalists and shamans would have even higher status, as would the favorite woman (or women) of the tribe's leader.

Note: While marriage is at least as old as writing, there is no evidence earlier hominids were monogamous. The GM will have to decide the tribe's customs. Promiscuity may be the rule, with males or females or both choosing their partners freely (in which case, there is no penalty for the Lecherousness disadvantage). Or a harem system may exist, with individuals (again, male or female or both; GM's choice) having a number of partners equal to their status or their ability to provide food. If PCs want to be monogamous anyway, the GM will have to decide whether this is tolerated or taboo: it may be a beginning for an Outlaws campaign!

Technology

During their 1.3-million-year history, *Homo ergaster* and *Homo erectus* perfected the making of stone tools and learned how to make and control fire. These improvements in technology enabled *H. erectus* to survive in a wider variety of environments and to develop a more sophisticated culture.

Early *Homo ergaster* didn't have a technology much more advanced than that of *Homo habilis*. The Acheulean hand axe – a fist-sized rock with sharp edges created by chipping or flaking – was his primary tool/weapon. He used fire when it occurred naturally, but did not know how to make or maintain it. As a result, food was still eaten uncooked.

Later *H. erectus* tribes, from a period beginning perhaps one million years ago, were more sophisticated. They maintained permanent hearth fires in their caves and camps, though they could not create fire. They built crude, lean-to shelters. In addition to an improved hand axe, *H. erectus* made simple knives and scrapers with a new flaking technique which employed a hammer of wood or bone (see sidebar, p. 95). Bone and wood were also more common tool materials; spears with fire-hardened points, bone scrapers and punches became part of the tool kit of early man.

During the period lasting from about 500,000 years ago to the appearance of *Homo sapiens*, *H. erectus* had a well-developed material culture more advanced than that of some modern stone-age peoples. He had mastered fire, making it by the flint-sparking method, and cooked his food. An improved ability to cure animal hides made possible simple clothing, blankets and sacks. *H. erectus* of this late period possessed better tools than his predecessors, as well as fire-making implements. He also had a limited knowledge of first aid and medicinal plants.

Language

Homo ergaster and *Homo erectus* may not have had fully developed vocal apparatus, but they could communicate more effectively than the less intelligent *H. habilis*. They were capable of more complex sounds, and were able to form a small number of true words. Still, gestures, sign and body language remained a major part of communication. Simple past and future tenses may have been a part of later *H. erectus* speech, as might the ability to express more abstract concepts such as cause and effect, simple mathematics, and objects or events removed from the location of the conversation. These developments are essential for storytelling and the preplanning of cooperative efforts such as hunting. *H. erectus* language skill cannot be greater than 9.

Naming practices were somewhat more advanced, making it possible to distinguish individuals within an occupational category. Names were probably descriptive in nature, usually referring to some physical feature – Long Arms, Red Hair, Fat Belly – rather than a character trait, skill or deed.

Society and Culture

The cultural and social organization of early *H. ergaster* was basically identical to that of *H. habilis*. Cultural development increased with the passage of time and improvements in technology. *H. erectus* tribes of one million years ago

and later had between 20 and 40 individuals, of which 1/4 were adult males. The bands were less nomadic than *H. habilis,* and often occupy a single site for months at a time. A tribe would rarely break up into smaller units, but would migrate if an area became hunted out. Most bands had a number of locations which they use repeatedly for base camps. There was a more marked division of labor; the men hunted game while the women gathered edible plants, tended the fire, and took care of the children. There might be two or three dominant males, who commanded respect by virtue of their size, strength and experience. Two neighboring *H. erectus* bands might occasionally join together and cooperate in the hunting of a herd of reindeer or mammoths.

Cooperation is a crucial aspect of *H. erectus* society. Failure to cooperate would make an individual unpopular and unlikely to survive. Successful hunting depends on cooperative effort, and large prey such as mammoths could only be hunted by a group. All food, both vegetable and animal, was shared by the entire band. Refusal to share food endangered the group, and was a very serious transgression. *H. erectus* characters have a Sense of Duty (-5) to their own tribe. A consistently selfish tribe member had best be very strong and have friends. Selfishness, along with incest, murder, madness and endangering the tribe, could result in exile. Every member was expected to help hunt or gather food – slothful persons were unlikely to be supported by the rest of the tribe. A lazy *H. erectus* would eventually get hungry enough to work for his supper. This emphasis on the common good has a grim side, however – individuals who for some reason could no longer contribute, perhaps because of disease, crippling injury or old age, were abandoned. The good of the tribe must come first.

H. erectus had little religion, although he did have the intelligence to wonder how the world works. Individuals from the later period might have very simple beliefs regarding the nature of certain animals. The mammoth was associated with prosperity because when killed it could feed the entire band for several weeks. Similarly, cave lions were noted for their ferocity and power. These simple associations were the precursors of the symbolization necessary for true religion. Shamanism does not exist in *H. erectus* society.

H. erectus bands do engage in social activities. Special celebrations involve re-enactments and storytelling. A successful hunt is the most common cause for celebration, but later *H. erectus* tribes celebrate the coming of spring and the birth of a child as well. The tales usually concern events which occurred within living memory, and contain information about the behavior of animals and the nature of the environment. Re-enactments are like very simple plays, with tribe members taking on the roles of animals and people. By watching and listening, children learn the survival skills they will need as adults.

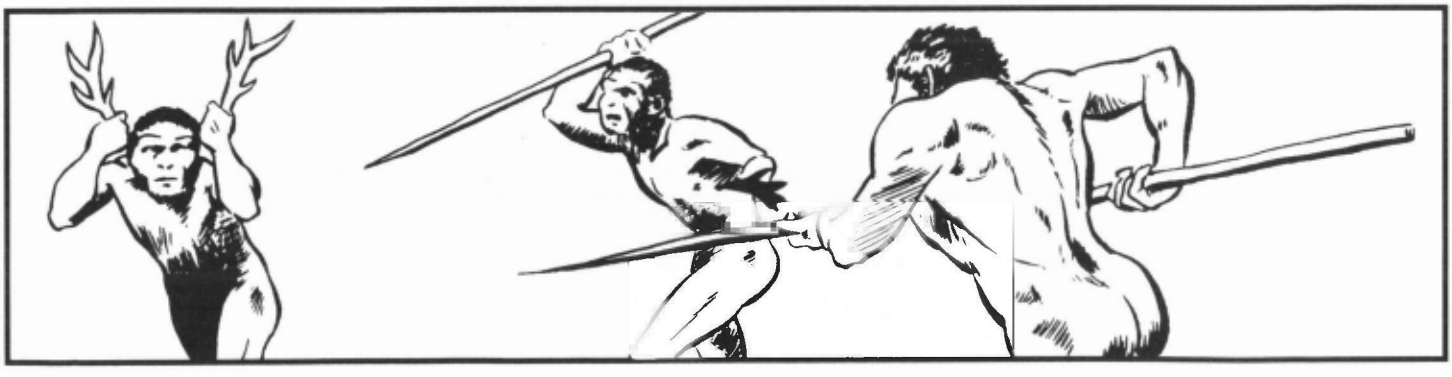
TECHNOLOGY, LANGUAGE AND SOCIAL DEVELOPMENT

Technology and language are key factors in the social evolution of hominids during the Pleistocene. They are the manifestation of the ever-increasing ability to think in the abstract, and let hominids cope with their environment more successfully.

The process of manufacturing a tool involves a complex thought process. The maker must visualize not only a specific problem to be solved, but also an item, which when used in a certain way, will solve the problem. Then the proper materials have to be gathered, and the tool constructed. This same thought process is applied to problems solved by cooperative group effort, manpower being the "tool" and cooperation the method.

Likewise, language is a symbol system which allows a person to express or describe intangibles such as actions, feelings and ideas. It facilitates cooperation, which in turn provides social and intellectual stimulation, increasing language ability. Through language, members of a group can exchange ideas, which may lead to improvements in technology.

Language, technology and cooperative behavior are all cultural adaptations which improve the hominids' ability to survive. With technology, less work is required to support a larger population. Increased free time and population makes it possible for individuals to choose mates based on personal preference and compatibility rather than necessity. This freedom of choice is probably the source of the emotion of love and the concept of friendship. Prior to *H. habilis,* or perhaps *H. erectus,* this freedom and the things associated with it did not exist. Love and friendship bind the family group and the band together, leading to further socialization, which in turn increases language use, technology, cooperation and emotional development.



THE EVE THEORY

In 1987, geneticists at the University of California at Berkeley and Emory University in Atlanta announced the discovery of a woman they dubbed "Eve."

This woman – who probably lived in sub-Saharan Africa between 285,000 and 143,000 years ago – was, according to the scientists, the common ancestor of all living humans today. The unique thing about Eve is that there is no fossil evidence of her; instead we all carry it in our cellular DNA.

Studying samples of mitochondrial DNA from subjects native to Africa, Asia, Europe and North America, the two groups noted the variation in the DNA structure. Since mitochondrial DNA is inherited only from the mother and is altered only by chance mutations, the geneticists were able to calculate how many generations would be necessary to account for the observed variation. The answer was approximately 10,000. This placed Eve around 200 millennia ago, at least a million years younger than the most recent common ancestor postulated by paleoanthropologists. Eve was not the only woman of her generation, simply the most fruitful. The lineages of all the other mothers of her time died out – that is to say, at some point their descendants failed to have daughters.

The new findings could have a major impact on evolutionary theory. Instead of evolving slowly from *H. erectus,* modern *Homo sapiens* may have appeared suddenly, in one place, *in one family,* and spread across the globe in a mere 200,000 years. The new breed had some special advantage, says the Eve theory, that enabled it to rapidly displace every other hominid species on Earth. According to this theory, *H. neanderthalensis* was a dead end, and not ancestral to modern humans at all.

There are holes in the Eve theory. The sample has been increased since the California study, but some scientists are skeptical about the calculations which produced the date, and others simply can't accept the proposed swiftness of the human "takeover."

The controversy isn't likely to be solved soon, but one thing is certain: genetics is destined to become a major force in the study of humankind's origins.

Homo heidelbergensis -10 points

Homo heidelbergensis first appeared on Earth about 300,000 years ago. They inhabited all of the regions of their predecessor, *Homo erectus,* and expanded northward as well, occupying Northern Europe and Siberia. *H. heidelbergensis* flourished until about 35,000 years ago.

Advantages and Disadvantages

Homo heidelbergensis is very similar to modern man; a starting character has ST+1 (+10 points), IQ-1 (-10 points), normal DX and HT, as well as the disadvantage Short Lifespan × 1 (-10 points). A character may not take more than one level of Magery, but there are no other limitations on skills and advantages. All character types (p. 107) are possible for *H. heidelbergensis.*

The lifespan of *H. heidelbergensis* is slightly longer than that of *H. erectus,* and they mature more slowly. A character must be 15 to start at normal attribute levels, and is old at age 35. Rolls for attribute loss increase to once every six months at 45 and once every three months at 50.

Technology

Homo heidelbergensis species have a technology very similar to that of late *H. erectus.* They can make and control fire and create clothing, shelter, bags and other items out of animal skins, and are skilled at fashioning stone tools. They do not, however, have many items common to the later Neandertal and Cro-Magnon man.

The tools of *H. heidelbergensis* are still primitive, and consist of the hand axe, wooden spear (with fire-hardened point), flake knives and scrapers, bone points and clubs. The one major development is the hafting of the standard hand

axe, made by using leather strips to lash the stone into place. Knives with hilts and stone spearpoints are still unknown. The quality of stone tools is slightly better – mastery of the hammer-flaking method gives cutting tools a sharper edge.

H. heidelbergensis has a large array of items made from animal skins and plants. Simple but warm clothing is made by wrapping hides around the body and securing them with leather strips. A cured hide with a hole cut in it for the head serves as a poncho-style garment. Large furs are also used for blankets, tents and curtain-like doors in cave openings. Various types of containers are made from animal parts, including water bottles from the stomachs of larger creatures. Sewing and thread are not known, so pouches and the like are limited to those configurations which occur naturally.

H. heidelbergensis also invented the bow and palette method of making fire (see p. 110). A faster, surer method than sparking, it is more likely to work with damp materials or in wet conditions. He has also learned to preserve meat by smoking it or leaving it out to freeze when the climate is cold enough.

Physical Appearance

Homo heidelbergensis still retains several primitive features. His brain is as large as that of modern man. He has a larger, heavier jaw, and a slight remnant of the bony brow ridge of *H. erectus*. Also, he is shorter and stockier – use the chart for normal humans, subtracting 3" from height and adding 15 pounds to the weight. Skin and hair color vary considerably, although blond hair and very fair skin are not yet found. Still, you could put a cap and modern clothing on a *H. heidelbergensis* and he could pass unnoticed on almost any city street.

Language

Homo heidelbergensis has a fully developed vocal ability, and can produce most or all of the sounds found in modern languages. Spoken language itself is still fairly simple, lacking perfect tenses and participles, and using a small vocabulary. Sign language is used in conjunction with speech to allow more expressive communication and while hunting because it is silent. *H. heidelbergensis'* greater language ability has led to new activities such as storytelling and singing. His maximum language skill is 10.

Along with a more expressive language, *H. heidelbergensis* had more elaborate naming practices. Names are primarily descriptive, but they might also emphasize character traits, deeds or skills as well as physical features. Names might describe idealized characteristics rather than real ones. This type of abstract thought is new to the hominid species, and sets *H. heidelbergensis* apart from his ancestors. Names aren't selected simply for their sound – a distinctly modern phenomenon.

TOOL-MAKING TECHNIQUES

Many methods of creating stone tools have been used throughout hominid history. Anthropologists spend a great deal of time and effort classifying tools according to the way they were made. Artifacts are identified as belonging to a certain tool "culture" – tools made with similar construction methods. The various techniques range from very crude to surprisingly complex; each advancement made possible a whole new range of tool types.

Oldowan

The Oldowan tool culture derives its name from an alternate spelling of the famous Olduvai (Oldoway) gorge, where it was first identified. Oldowan tools are often referred to as "pebble tools" because they are almost always made from smooth, rounded rocks from stream and river beds. They range from tiny to fist-sized, and can be made with a few sharp blows. Four or five flakes are knocked off one side of a stone by striking it with another rock, producing a short, jagged edge. The opposite side, still smooth and round, provides a firm, comfortable grip.

Oldowan tools may have been made first by *Australopithecus* about 2.5 million years ago, but *H. habilis* was the first hominid to make them in large numbers and of a regular pattern. The Oldowan tool industry lasted until the appearance of *H. ergaster* about 1.5 million years ago.

Acheulean

Characterized by its famous, teardrop-shaped hand axes, the Acheulean tool culture lasted for over a million years. Acheulean tools display a wide range of complexity, the earliest being only slightly more advanced than pebble tools. Until about 500,000 years ago, Acheulean hand axes and choppers were made by the stone-against-stone method. Later stone knappers often used a hammer or baton of wood or bone to sharpen the tool's edges. All the hand axes from this period have a symmetry lacking in Oldowan tools, demonstrating the greater skill and foresight of their makers.

The Acheulean tool culture encompasses a few other stone tools, such as scrapers and cleavers. A primary characteristic of all Acheulean tools, however, is that only one tool is made from a block of stone. What is left over is discarded.

Continued on next page . . .

TOOL-MAKING TECHNIQUES (CONTINUED)

Mousterian

Mousterian tools were made exclusively by the Neandertals, beginning between 200,000 and 100,000 years ago. A new method, known as the Levallois technique, allowed early men to create a much wider variety of stone implements. Rather than the wasteful one rock, one tool method of knapping, the Levallois method employs a prepared stone core from which flakes are struck. These flakes are then fashioned into tools. Five times as much useful cutting edge could be gotten from a single lump of stone. The Levallois technique was mastered by the Neandertal, who made a wide variety of tools from stone flakes as well as bulkier axes, choppers, etc. These included knives, scrapers, shavers, borers and spearpoints.

Upper Paleolithic Cultures

The Mousterian tool culture was succeeded by a large number of Cro-Magnon "cultures," each named after a specific place where their tools were discovered and often dated to overlapping time periods. The tools are of very fine workmanship, much sharper and more delicate than previous artifacts. The spearpoints, arrowheads, borers, engravers, knives and other items were all manufactured using a new knapping method called pressure flaking. After a tool was roughly shaped by the baton method, it would be finished using a pointed implement, usually made of wood or bone. By placing the point on the edge to be sharpened and forcing it downward – perpendicular to the edge – a small flake was driven off. This was repeated until the desired shape was achieved.

Society and Culture

Homo heidelbergensis lives in bands of about 30, like *erectus*. Each band is made up of seven or eight men, about the same number of women, and the rest children and adolescents. Each day the men go out to hunt or scavenge meat, while the women forage in the vicinity of the camp and watch the children. The tribe has a leader, who is chosen for his good qualities – strength, intelligence, experience – rather than on the basis of heredity. They might also have a part-time shaman or healer. *H. heidelbergensis* bands are semi-nomadic, establishing seasonal base camps often situated along the migratory routes of game animals. Sites are often reused year after year.

Culturally, *Homo heidelbergensis* is far more advanced than *Homo erectus,* thanks primarily to his superior intelligence and linguistic ability. Religion, simple decoration, storytelling and a belief in magic are all part of *H. heidelbergensis* culture.

Religion

Early man saw his entire world as being filled with unseen beings, many more powerful than himself. He believed that all things in nature, including phenomena such as the wind and the rain, are "animated" by spiritual forces. This elementary form of religious belief is called animism. In the animistic worldview, living plants and animals, the sun, the moon and the stars actually possess spirits or souls, putting them on an equal footing with man. More abstract things – such as the rain, thunder and wind – are not themselves alive, but are caused by spirits. Furthermore, virtually every event which does not have an obvious, visible cause – Org is dead because he didn't get out of the way of that charging mammoth, for example – is attributed to the action of spirits. These spirits are generally more powerful than man, but can be manipulated by a skilled person.

In its most primitive aspect, animism has very few, if any, ceremonies or rituals. Instead, it is a simple system which explains how the world works, providing answers to such questions as "why does the wind blow" and "what is life." The belief that everything has a living spirit – which continues to exist after the plant, animal or man has died – almost certainly led to formal burial ceremonies, first practiced by Neandertals. It also provides a band with powerful motivation to care for members who cannot support themselves. Still, such support only extends as far as the group can afford it; in lean times the old and sick go without so that the healthy have enough to eat.

H. heidelbergensis' animistic beliefs influence his daily activity. Hunters take care not to offend the spirit of their prey, since that might make the hunt less successful or invite retribution from the spirit later on. They might use par-

ticularly fine weapons to honor the spirit of the animal being killed, and strive to make the killing blow quick and clean. Also, weapons made from or adorned with parts of the prey animal – hair, fur, teeth, bone, feathers, or claws, for example – are often thought to have special power or luck when used to hunt that animal.

Taboos are far more common in animistic belief. Their violation is thought to anger spiritual forces. For the first time there is a rationale explaining why the violation of a taboo causes bad things to happen. A single tribe may have many taboos, including ones against incest, the killing of certain animals, going to certain places, and eating certain foods. Some tribes may also have social taboos prohibiting women from touching weapons or hunting, or men from witnessing childbirth. There is animistic reasoning behind all taboos, and dire spiritual repercussions if they are broken. Punishment varies with the taboo and the tribe, and ranges from public confession to the "silent treatment" to exile.

Magic

Practitioners of animistic magic, or shamans, occur along with the appearance of animism. Among *H. heidelbergensis,* shamans practice their art only part-time, spending most of their days hunting and gathering with their fellow clansmen. They know and use only the simplest spells, and concentrate primarily on healing. Often they are herbal healers as well. Charlatans are uncommon among *H. heidelbergensis,* since the shaman is not excused from other work.

Art

Homo heidelbergensis is the first hominid species to deliberately create an object or image, or alter the appearance of an object, for aesthetic purposes. The art of *H. heidelbergensis* is still very primitive, and consists mainly of coloring tools, clothing and themselves with natural pigments like ocher and ash. The coloring may have symbolic significance, or it may simply be for show.

Storytelling. Homo heidelbergensis is also the first hominid to create fiction. The fireside tales of early human tribes are still closely tied to the group's daily life, but the specific events may not be factual . . . the storyteller might fashion the tale to communicate important information or a moral. A more complex and expressive language also allows him to make the story more interesting. In addition to information about the environment and survival skills, stories now contain social lessons. Taboos, the common good and religion (animism) are frequent themes.

Neandertal Man -5 points

European Neandertal is the classic "cave man": powerfully built, living in a glacial environment, and hunting the woolly mammoth and the cave bear.

Neandertal man first appeared in Pleistocene Europe and the Middle East approximately 125,000 years ago, and is named for the Neander river valley in Germany where his remains were first found. He flourished for almost 100,000

THE CAVE BEAR CULT

Speculation concerning the existence of this cult began after the discovery of bear skulls in Drachenloch (Dragon's Lair) cave in Switzerland. Aside from numerous skulls and leg bones piled in a back corner of the cave, a stone-lined compartment in the floor was found to contain seven cave bear skulls, all facing the cave entrance. This "chest" was sealed with a large stone slab laid across the top of it. Another skull was found with the leg bone of a different bear thrust through it, and resting on the leg bones of two other bears.

That Neandertal hunted cave bears is known from bear remains found at other sites. Some scholars believe that the skulls at Drachenloch are the first known example of man collecting hunting trophies. Others are of the opinion that the bones had been carefully arranged by Neandertals as part of a religious ceremony.

They postulate a cult of the cave bear, in which the animal had a ritualistic significance. Using bear cults from Siberia and the Ainu of Japan as models, the supporters of the bear cult theory have built an intriguing picture of Neandertal religious life as it might have been.

It was spring, and the young hunter thought about the annual sacrifice of the great bear that would soon take place. It had been kept all winter in the old cave on the mountainside; its powerful spirit had protected the tribe during the hungry time. Now it was time for it to be released. He and the other young men of the tribe would kill the bear. Then they would eat of its flesh, consuming the bear's power. It would make them strong for the hunting season.

The great bear's bones would then be stripped clean, and the skull kept in the cave with the tribe. The bear's spirit would be angry if they did not honor it. That might mean a poor season's hunting just when the tribe needed food the most. Even worse, they might not be able to find a new protector when the cold returned. He shivered at the thought. The old shaman would guide them through the proper rites, he reminded himself, and the sacrifice would be made. The tribe would prosper.

WHAT HAPPENED TO NEANDERTAL?

Neandertal man had flourished in Europe for some 90,000 years when he disappeared from the fossil record and was replaced by the small-jawed Cro-Magnon. In evolutionary terms his demise was quite sudden, and the fate of Neandertal has been the subject of controversy for many years. The major theories about his disappearance are outlined below.

Neandertal Phase Theory. In this view, Neandertal man is merely an intermediate form of *Homo sapiens*. He evolved into Cro-Magnon man, just as large-jawed humans gave rise to modern humans in other parts of the world. The absence of fossil evidence for this change in other regions is attributed to lack of research done on the period outside of Europe. Modern racial differentiation is thus explained by the independent development of *H. sapiens sapiens* in various geographic areas.

Garden of Eden Theory. In this scenario modern man appeared in one place, and spread out from there to colonize the world. The more primitive *Homo heidelbergensis* and *H. neanderthalensis* were pushed into fringe areas where they died out. This theory also advocates the same sort of localized origins for *H. habilis, H. erectus, H. heidelbergensis* and Neandertal, with Africa or the Middle East as the region of origin. This viewpoint has recently been reinforced by evidence from genetic research (see sidebar, p. 94). Violence may not have been involved, or needed: better communication and a lower mortality rate may have made it possible for Cro-Magnons to completely take over Neandertal territories in less than a millennium.

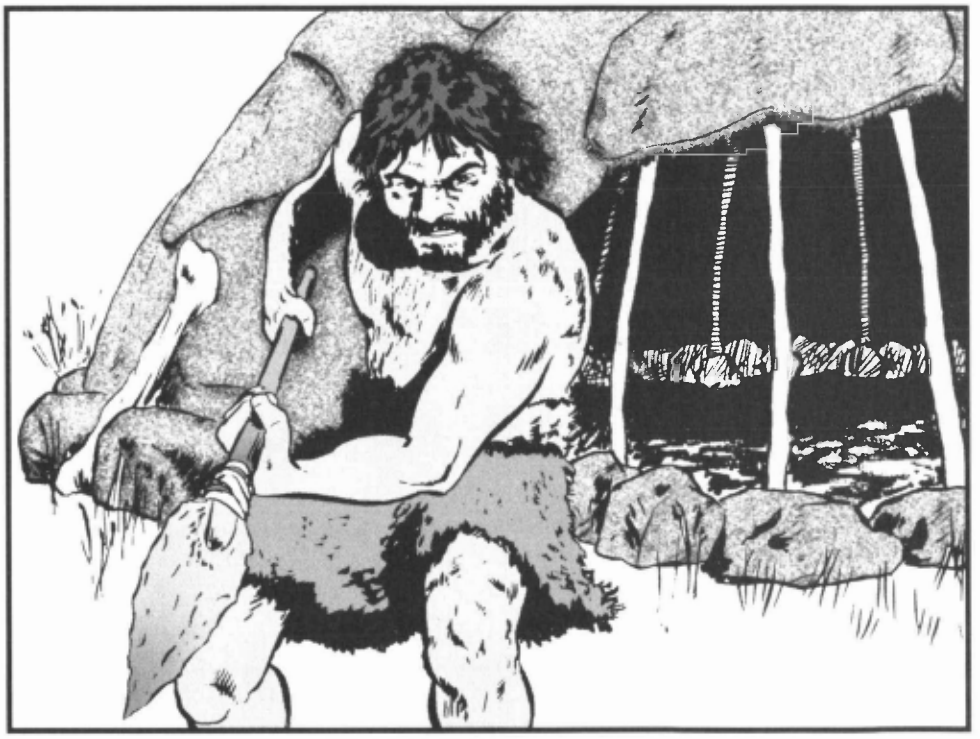
Assimilation Theory. This is a combination of positions. Modern man evolved in one or a few small locales, and then began to spread out across the globe, but rather than eliminating Neandertal completely, the new population *absorbed* him. The genetic difference between the two sub-species may have been small enough to allow interbreeding, and the large-jawed humans were simply assimilated into the new breed. In this case, it is likely that many of us have a Neandertal gene or two in our hereditary makeup. However, there is no fossil evidence of interbreeding between Cro-Magnon and Neandertal to support this theory.

years, in conditions ranging from arctic to tropical, until he was replaced by the Cro-Magnons. The most recent identifiable Neandertal remains have been dated at about 32,000 years old. There is considerable debate as to whether Neandertal man is a sub-species of *Homo sapiens* (*H. sapiens neanderthalensis*) or a distinct species (*H. neanderthalensis*).

Advantages and Disadvantages

Neandertal man is considerably more robust than modern man. Neandertal characters have ST+2 (+20 points), DX -1 (-10 points), and normal IQ and HT. They have the disadvantages Sense of Duty toward their religious beliefs (-5 points) and Short Lifespan × 1 (-10 points). They take taboos, rituals, spirits and the instructions of their shaman very seriously. All skills are available to them, but they may have no more than two levels of Magery. As with *H. heidelbergensis*, all character types (p. 110) are appropriate for Neandertal characters.

Neandertals live a little longer on the average than *H. heidelbergensis* individuals; characters must begin making annual rolls for attribute loss at age 40, increasing in frequency at ages 50 and 60. As with modern humans, Neandertals have normal beginning stats at the age of 15, but, unlike modern characters, they must be under that age if they take the Youth disadvantage – once physically mature a Neandertal character is considered an adult.



Physical Appearance

The classic image of Neandertal as a hulking brute with sloping shoulders, a hunched back and bowed legs is a fallacy. This description was popularized after the discovery of the first complete Neandertal skeleton – an individual deformed by severe arthritis. Later finds demonstrated that Neandertal man was almost identical to modern man except for his exceptionally large jaw, beetle brow, more robust bones, and larger cranial capacity. Neandertals are shorter and

stockier than modern humans, and more heavily muscled, but no more so than many amateur weightlifters today. They have fairer hair and skin than *H. heidelbergensis* or Cro-Magnon, who were adapted to warmer, sunnier climates.

Technology

Neandertals have a stone technology that is much improved over that of *H. heidelbergensis*. Mastery of the Levallois technique (see sidebar, p. 96) of stone knapping makes Neandertal a much more proficient toolmaker. The Neandertal tool kit has a wider variety of objects, including stone borers and shavers used to make clothing and other tools. The most important advances are the stone spearhead, first used by Neandertal, and the hafted stone axe, which he perfected. The spear, axe and club are Neandertal's primary weapons, replacing the obsolete Acheulean hand axe.

The harsher climatic conditions faced by Neandertal require better clothing and shelter. Stone borers are used to punch holes through which leather cords can be strung to make tents and garments. Simple bags and similar containers are also made. In addition to tents, Neandertal builds lean-tos from wood, bone and grasses. These dwellings may have a low wall of dry-stacked stone or mammoth bones encircling them. Caves are still the most common type of shelter, however, especially during winter. Neandertal man builds his fires in stone-lined pits, where he cooks meat and perhaps even some vegetables, but he has not learned to boil water.

Language

Neandertal language is not much more complex than that of *H. heidelbergensis* (his skill cannot exceed 10), although the vocabulary is somewhat larger, and they were probably able to pronounce the full range of sounds used in modern languages. Sign language is still an important part of Neandertal communication, but is used most often for emphasis rather than as the primary method of conversation.

The naming practices of Neandertal tribes are also similar to those of earlier humans, and 99% of all names are of a descriptive nature. Additionally, a name may be believed to have power over the person who bears it. Ceremony is often attached to the giving of a name, either at birth or the coming of age.

Society and Culture

Neandertal lives in larger groups than did earlier hominids; each band may number as many as 70 persons. The limiting factor on the size of a tribe is the environment. A tribe in a particularly harsh climate may be small – perhaps 20 or 30 members. A tribe in an area with relatively mild weather and plentiful game can be much larger. A one-to-one male/female ratio is still maintained, and adults constitute roughly 1/2 to 2/3 of the population. They follow the common pattern of dividing labor based

H. SAPIENS SAPIENS IN THE TROPICS

Cro-Magnon was not the only *sapiens sapiens* Pleistocene culture. Modern man during this period spread to the Americas and Australia, and already existed in southern Asia and Africa. Since North America and Siberia were also largely covered by glaciers during this period, treat the American branch as similar to Cro-Magnon, with a strong dash of Eskimo thrown in for good measure. Populations from warmer climes deserve more attention, however.

Early tribesmen from the tropics will have dark skin and hair, and tend toward a less stocky build. They will live in much larger groups, with tribes numbering perhaps as many as 250! The male/female ratio will be about the same, however.

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H. SAPIENS SAPIENS IN THE TROPICS (CONTINUED)

Technology for Cro-Magnon's tropical cousins is substantially different. Most tools are made from wood rather than stone. Blowguns could be added to the weapon list, as could the Boomerang. Rather than the sledge, the dugout canoe is a major form of transportation.

Clothing will be minimal, if worn at all. The type of game that is hunted depends on the environment, jungle, savannah and desert all being possibilities. For good examples of stone-age adaptations to these habitats, check your local library for books about the Aborigines of Australia, the San Bushmen of Africa and the Yanomamo of Brazil.

on sex: the men hunt, the women gather food and watch the children. Sex roles are incorporated into the social system, with customs and traditions which define proper behavior.

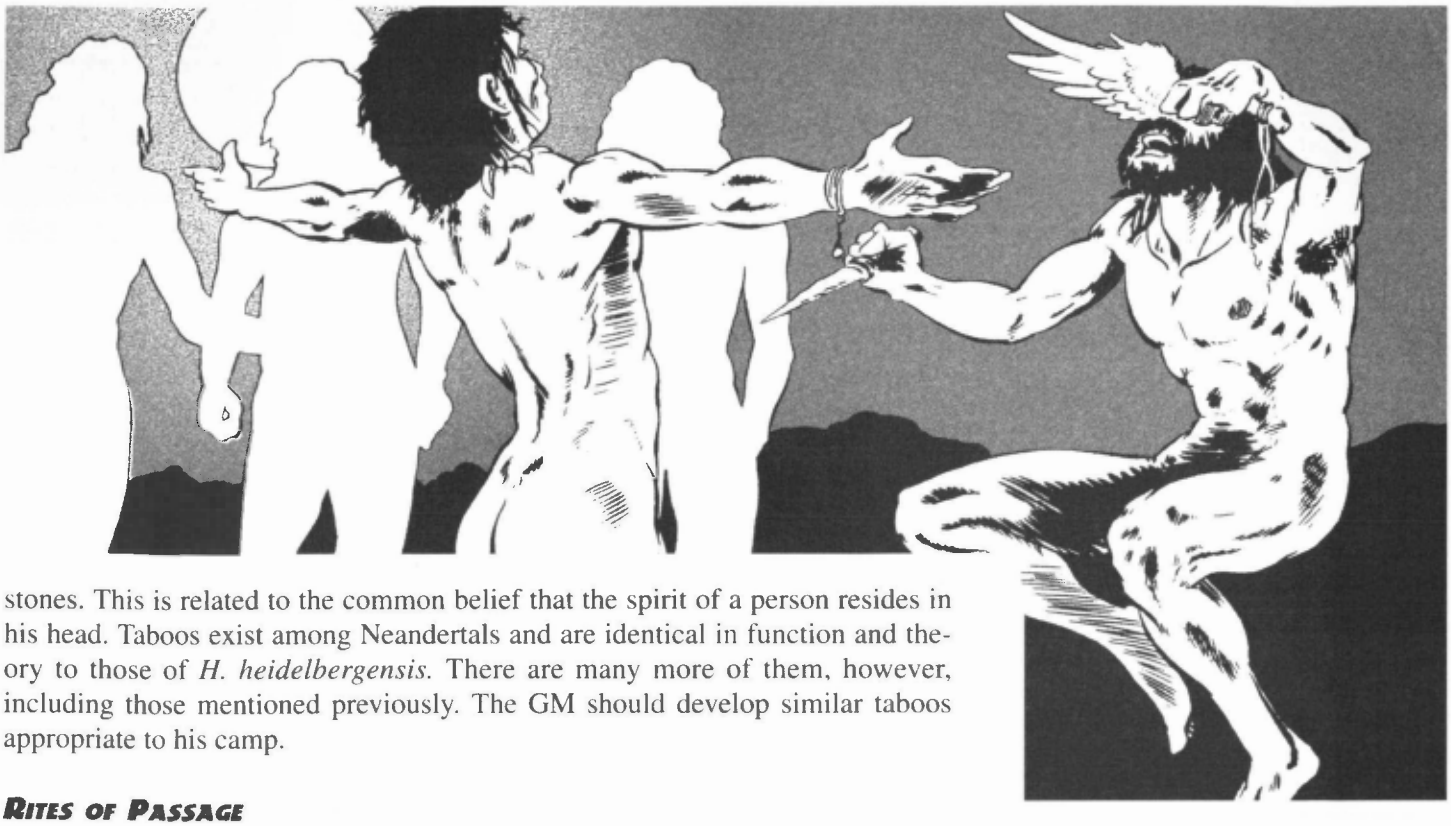
There is a better-defined social hierarchy within Neandertal tribes than in those of previous races. The vast majority of tribes have a definite leader. Leadership is usually not hereditary, as a chief frequently dies before one of his male offspring matures; the job passes to a chosen successor. In some groups there might be a contest of skills or ritual combat to determine the new leader, especially if the old chief died without choosing an heir, or was exiled for some reason. Next in prestige are the tribe's best hunters and the old men. Members of this group, which may also include the tribal shaman or healer, are respected for their skill and experience, and the chief rarely makes an important decision without consulting them. In fact, if all of these men act unanimously, they can depose a chief they do not like. The rest of the tribe's adults – men and women – are relatively equal in influence and rights, though their responsibilities are different.

RELIGION

Neandertal man is the first hominid known to practice what might be truly called an animistic "religion." The major difference between this and earlier practices is the evolution of ceremonies intended to affect the course of future events. Neandertal tries to appease or influence spirits in order to assure a good hunt, avert or end bad weather, and cure ailing tribe members. Primitive religion binds the society together, and all of these ceremonies involve the entire band, at least as spectators. Shamans, who specialize in the area of spirits and the spirit world, are very important.

Symbolization, something that was severely limited by the intelligence of earlier hominids, is a vital part of Neandertal religion. Animals represent abstract traits such as courage, ferocity, intelligence and virility. The spirits of the animals possess these traits, and can confer them on humans. It might be forbidden to hunt certain species, while others might be prized as food for hunters, warriors, or pregnant women and mothers. The simple representation of an animal may possess or invoke the same qualities or powers as the creature itself. Thus, weapons might be engraved with the image of a predator or prey to make them more effective for hunting.

Death has great significance for Neandertals. They believe that everyone has a spirit or soul which survives after the body dies. Neandertal dead are buried with an afterlife in mind, and they are prepared for the journey. Food, tools, weapons, jewelry and magic charms are often interred with the dead person for use in the spirit world. Bodies are frequently buried in the fetal position, or as if they are asleep. They may be decorated with red ocher dyes or even laid to rest on a bed of flowers. The more respected or important a person was in life, the more elaborate his funeral when he dies. Occasionally, the head is buried separately from the rest of a body, and encircled with antlers or



stones. This is related to the common belief that the spirit of a person resides in his head. Taboos exist among Neandertals and are identical in function and theory to those of *H. heidelbergensis.* There are many more of them, however, including those mentioned previously. The GM should develop similar taboos appropriate to his camp.

Rites of Passage

What had been simple celebrations at the birth of a child or a young hunter's first kill are, for Neandertal, important rituals marking the milestones of human life. These "rites of passage" are performed at birth, maturity, marriage and death. They are celebrations, but the ceremonies have a greater significance as well. They are a blessing which insure the health and success of the person during the next phase of his life. Dancing, storytelling, sacrifices, fortune telling and similar activities are performed with the entire tribe in attendance.

Perhaps the most important of the rites is that of initiation, signifying an end to adolescence and the beginning of adulthood. These rites involve scarring or other trials to be endured by the initiates. The purpose is to test the young person's readiness for the responsibilities of adulthood. All the boys and girls of appropriate age are initiated together, in one ceremony. Among Neandertals, this takes place at about thirteen or fourteen years of age.

Magic

Most Neandertal shamans are part-time practitioners, but they have more skill and prestige than those in primitive *sapiens* tribes. They often play a major role in the religious life of the tribe, contacting the spirit world and directing ceremonies and rituals. Their primary activity is healing – by both magical and natural methods.

Art

In addition to decorating with natural pigments, Neandertal makes and wears jewelry fashioned from attractive stones, bone, wood, horn and animal teeth. This jewelry is most often strung on a leather thong and worn around the neck, although it may be attached to clothing. Neandertal scratches crude images on tools, weapons and stones, usually for magical or religious purposes.

DOMESTICATION OF ANIMALS

There is some evidence to suggest that man may have begun to domesticate or at least control animals as long as 30,000 years ago. That Cro-Magnon peoples exerted some control over animal populations in some regions seems probable.

Many sites throughout Europe are superbly located for the herding and manipulation of prey animals, but poorly situated for general hunting. At most of these locations food debris has been found to consist overwhelmingly of one kind of animal remains. In fact, the last 10,000 years or so of the Pleistocene Epoch in Europe has been called the Age of Reindeer. Tribes may have followed the reindeer herds much as some Siberian tribes do today. Large numbers of horse bones found at the base of a cliff in France have been interpreted as the remains of herds trapped there in an annual drive and slaughtered. The elusive ibex may well have been exploited in a similar fashion by the hunters of La Vache in the French Pyrenees.

Cro-Magnon Man -10 points

Homo sapiens sapiens, the modern subspecies of *H. sapiens*, first appeared at least 60,000 years ago, and possibly 120,000 years ago. He spread into all of the regions inhabited by Neandertal, and to Australia and the Americas as well. In Europe he is represented by Cro-Magnon man, who inhabited the continent until the end of the last glaciation 10,000 years ago. This section deals exclusively with this early European branch of modern man, the classic people of the Pleistocene Ice Age.

Physical Appearance

Physically, Cro-Magnon is nearly identical to humans today. Males from warmer southern climes averaged 6' in height (more in some areas); individuals from colder regions were somewhat shorter and heavier than the average person in the U.S. (This may be a physical adaptation to the cold, as exists in Eskimo populations – it reduces the body's total surface area, allowing better heat retention.) Cro-Magnon individuals generally have fair hair and skin, and often have extensive facial and body hair. In short, Cro-Magnon man is indistinguishable from someone you might pass on a city street.

Advantages and Disadvantages

Cro-Magnon characters are built on the same number of points as modern characters. They have only one natural disadvantage, Short Lifespan × 1 (-10 points) but are smarter and have more points to spend on skills than characters of more primitive races.

The lifespan of Cro-Magnon man approaches that of modern men, but his environment still takes its toll. Cro-Magnon characters must begin rolling for attribute loss at age 40. Rolls increase in frequency at 50 and 60 years of age. As with modern characters, they have normal starting attributes when they are 15; but, like Neandertals, are considered adults at that age and must be younger in order to have the Youth disadvantage.

Technology

While Neandertal could only kill from a distance by throwing rocks and spears, Cro-Magnon has an entire new class of weapons available to him – ranged ones. He invented the bow, sling and spear thrower, allowing him to kill from large distances with less personal risk. He makes barbed points from bone and horn for arrows, spears and harpoons – as well as fine, leaf-shaped stone points with more penetrating power than those of Neandertal. Ranged weapons dramatically increase Cro-Magnon's hunting ability.

Weaponry is not the only area of improvement. A skilled stone knapper, Cro-Magnon makes a wide variety of excellent tools. A typical tool kit might include burins – a type of stone engraver – scrapers, borers, cleavers, shavers and knives. Cro-Magnon skill can create stone tools with edges as sharp or sharper than those of many metal blades. The preferred material is flint, but obsidian – if available – makes a sharper edge. Fine axes are made, but knives still lack hilts. One edge is deliberately dulled so that the blade can be safely held.

Bone, wood, ivory and horn are used more frequently by Cro-Magnon than by his predecessors, and are more versatile than stone. Bone needles are used by all Cro-Magnon tribes, and bone fishhooks are used by some. Small oil lamps made from bone or ivory are common. Other items include spear straighteners, awls, hammers and tent stakes.

Cro-Magnon has learned to use every part of the animals he kills, not just the meat. Bones and antlers are used for tools, weapons and jewelry. Fat is boiled down for oil which can be used in lamps for lighting. Muscle sinews and gut are used as thread for sewing, making jewelry and bowstrings. Skins are stitched together to make warm clothing, watertight bags (lined with bladders from animal stomachs or intestines) and rainproof tents. The clothing of Cro-Magnon is particularly crucial, given the arctic cold he must endure. Boots, mittens, leggings and fur coats with hoods are all necessary items. Water is boiled in bags sewn from animal hides by placing fire-heated rocks in the bag or hanging the bag over a fire. If the water level is kept high enough, water bubbling over the edge and running down the sides of the bag prevents it from burning.

Cro-Magnon man no longer relies primarily on natural shelter such as caves, but constructs several different types of dwellings. In addition to tents made from tanned hides, some tribes build huts of wooden frames covered with moss or, in warmer climes, grass thatching. These buildings may be strengthened by foundation walls of unmortared stone or stacked animal bones. Cro-Magnon dwellings are located in sheltered places such as valleys, against cliff walls or in groves of trees. They are always near a source of fresh water.

Sledges and dugout canoes are the first form of transportation other than walking to be used by man. Cro-Magnon and his contemporaries in other regions are the first hominids to build and use these items. The sledge is a large platform with runners which are deliberately coated with ice. It is pulled by a person – animal domestication is as yet unknown – allowing him to move heavy loads across the snow and ice.

Language

The languages of Cro-Magnon are as complex as those of today, and as effective for expression. Regional variation is greater than that for Neandertal, and groups separated by significant distances may have trouble communicating. Sign language is less important and Gesture is more common, especially for hunting. Naming practices are the same as for Neandertal.

Society and Culture

Cro-Magnon knows more about the world he lives in than any hominid before him. He has a complete knowledge of local plant life and any medicinal properties various species might have. He understands and exploits the natural life cycles of animals, enabling him to hunt more efficiently. Most importantly, Cro-Magnon has a clear concept of time. He follows the changing of the sea-

THE AGE OF ART

The Cro-Magnon era, 35,000-10,000 years ago, is called by some scholars the Age of Art. During this period there is a virtual explosion of artistic efforts by Cro-Magnon peoples. The most famous of these are in a cave in what is now southern France. Cro-Magnon paintings are almost exclusively of common prey animals such as wild cattle, reindeer, horses, ibex and mammoths. Images of predators and of humans are uncommon.

The paintings are not usually found in caves which serve as living quarters, but are instead located in deep chambers which are relatively inaccessible. The paintings are used for ceremonial, possibly totemic purposes. Animals are often depicted with spears sticking in them, or bleeding from numerous wounds. Another frequent motif is that of the human hand, fingers outstretched. The handprints are often placed in such a manner as to imply a signature, as if to say "I made this."

Continued on next page . . .

sons, can predict the onset of each one, and keeps track of days by watching the phases of the moon. He is also familiar with typical weather patterns and can accurately guess when storms are brewing.

Cro-Magnon bands are actually smaller than many Neandertal groups, due to the terrible cold of late Pleistocene Europe. A Cro-Magnon tribe – consisting of several clans which come together only two or three times a year – might be very large, numbering in the hundreds. Individual clans number around 30 persons, half of whom are adults. Because of the arctic conditions, the diet relies heavily on meat; some tribes may be almost totally carnivorous, especially during the winter. In addition to large game animals, fish, mollusks and seals are staples. Women spend more time at the base camp. Activities such as child care, sewing, preparing hides, repairing tents and containers, and cooking leave less time for foraging. The men of a tribe hunt regularly, often making extended forays lasting several days. Two or three men always stay behind to protect the tribe.

The hierarchy of Cro-Magnon clans is very similar to that of Neandertal groups. Leadership is more institutionalized and a chieftain carries slightly more authority. Hereditary leadership is more common because of Cro-Magnon's greater life expectancy. Older adults still command respect as well, and in a small clan no chief can ignore the opinions of his fellow clansmen. An entire tribe and its constituent clans are led by all the clan chiefs together. Among the chiefs, the oldest and wealthiest are predominant. Problems which require a decision affecting the entire tribe are rare and always serious. A violent intrusion by strangers, a plague, famine or extremely severe weather might require tribal action. These situations are usually dealt with through religious ceremonies, often involving the tribal shamans. The ultimate solution, migration, is employed only if all else fails.

THE AGE OF ART (CONTINUED)

Portable art is also a trademark of Cro-Magnon man. Small figurines and engraved pieces of bone and antler are most common. Images carved on bone and horn tools may be purely decorative, or serve some magical or religious purpose.

Seasonal compositions are common, usually focusing on spring and the animal life typical of that time of year. These may have a very practical function, since they can be used to teach children about the life cycles of common prey species. One engraving, for example, shows two seals following salmon upstream during the spring mating run, along with a snake and aquatic plants.

A four-hole bone flute, dated to 30,000 B.C., is proof that Cro-Magnon man had a remarkably sophisticated grasp of music: drums and horns are presumably even more ancient.

Religion

Cro-Magnon religion is basically animistic, though much more elaborate than Neandertal's. Belief in a spirit world and the spiritual nature of elementary natural forces is central. Animal spirits are especially important in the most common version of Cro-Magnon religion – totemism.

Totemism is an advanced form of animistic belief in which a tribe or clan has a symbol, or totem, identified with it. The totem is almost always an animal species, but occasionally is a plant or natural phenomenon. A totem has great religious significance to its tribe. In fact, the tribe and the totem are thought to be related, as if they were part of the same family. A member of the Eagle tribe might say "I am an eagle!" – and mean it in a literal sense. The tribe's prosperity is closely associated with the fortunes of the totemic species or phenomenon. If the horses in the territory of the horse clan are decimated by disease or famine,

the clan is believed to be in grave danger. If the horse population is thriving, it is a good omen for the clan. The hunting and eating of horses might be forbidden to members of the clan, or allowed only on special occasions. Ceremonies to insure the prosperity of the horse herds would figure prominently in the clan's religious activity.

The totem of a tribe or clan also functions as an identifying badge, similar to a coat of arms in medieval Europe. The men of a tribe paint the image of the totem on their bodies before important ceremonies or meetings with other tribes. The totem identifies the possessions and homes of the tribe. Thus, a lion skin might be hung from a pole in the center of the lion clan's camp, or above the entrance to a cave they claim as their own. The totem would also be depicted on the tribe's sacred objects, if any, and the image of it would be a part of all ceremonies and rituals.

A tribe's members might actually exhibit the behavior of, and bear a physical resemblance to, their totem. Men in the horse clan may cut their hair to look like a horse's mane or tail. Bear tribesmen who are large and hairy would be considered handsome and virile by their tribe. They would have their choice of mates, and have greater prestige than those with less resemblance to bears. Slowly, the bear-like attributes would be selected for, and members of the bear tribe could come to resemble their totem more and more.

Cro-Magnon society has many taboos which regulate the behavior of its members. These restrictions are similar to those described for *Homo heidelbergensis* (see p. 97). The rise of totemism increases the number of animal, dietary and hunting-related taboos drastically, however.

Rites of Passage

The same basic events are celebrated by Cro-Magnon as by Neandertal, and in much the same way. Ceremonies are more complex, involving totemic imagery. The GM should use his imagination.

Magic

In Cro-Magnon tribes, the art of shamanism has come into its own. Virtually every clan has at least a part-time shaman, and every tribe has a full-time one. Unlike Neandertal shamans, these men are more than healers or priests; they are sorcerers with unique powers relating to the supernatural and matters spiritual. The tribe relies upon them to mediate with the spirits on their behalf. If a tribe loses its shaman, its very existence is in jeopardy. Shamans have great influence within their tribe or clan, and may be wealthy (see p. 111).

THE VENUS CULT

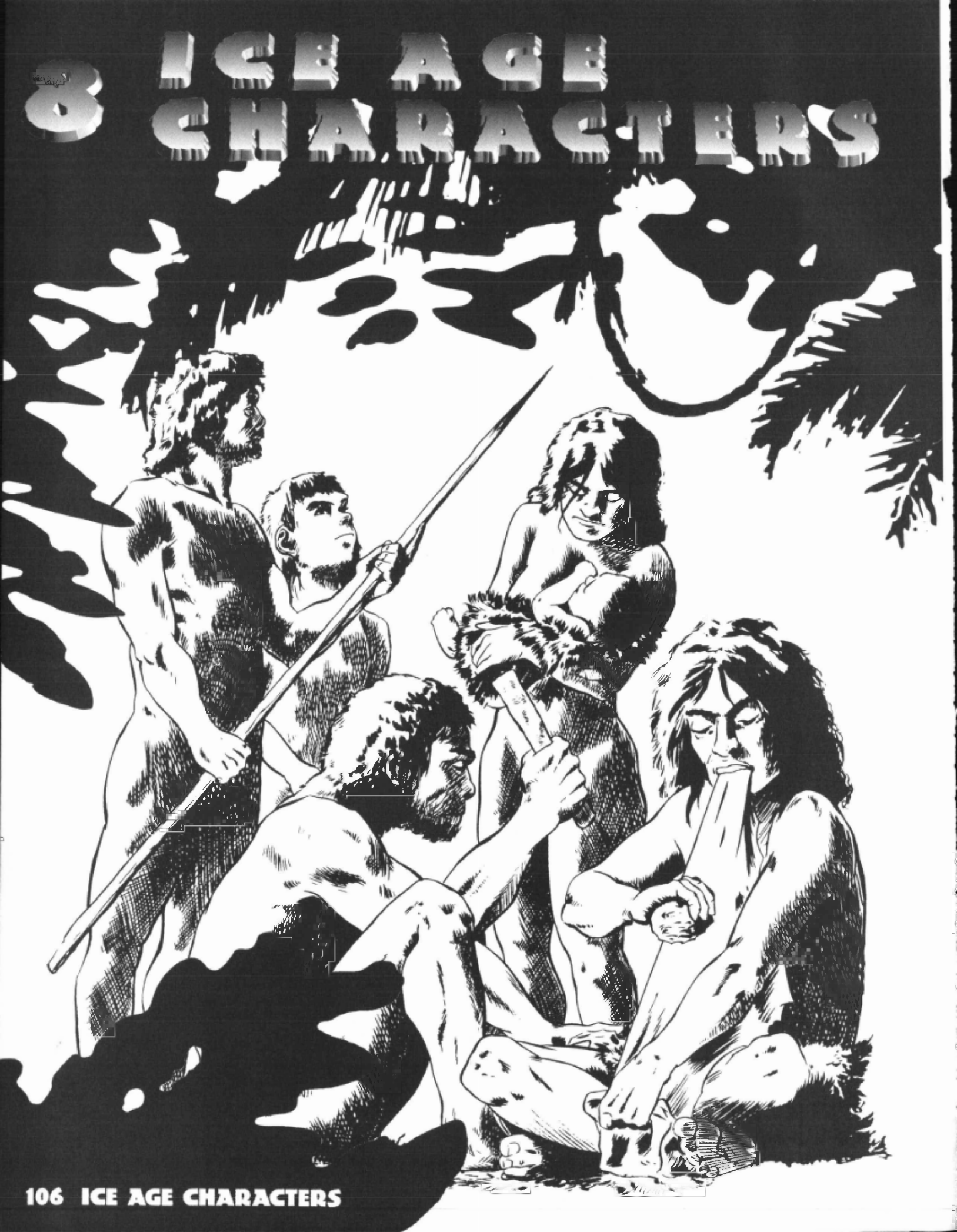
Ice Age *man* almost never depicted himself in his art. Many representations of early *women* have been discovered, however. All across Europe, small female figurines have been found at Cro-Magnon campsites. Their discovery has led a number of anthropologists to speculate on the existence of a "Venus" cult.

All of the figurines have several features in common. Each is a female with grossly exaggerated buttocks, thighs, stomach and breasts; the females represented often seem to be pregnant. Also, the figures lack facial features; some are completely headless. It seems apparent that they do not represent a specific woman, but rather womanhood in general.

It is generally believed that these figures served some religious function having to do with fertility. They may have been used in rituals at marriage, birth and female initiation. The figures are well worn and obviously were carried about for some time, being small enough to be easily portable. In fact, their wide geographical distribution suggests that they may have been traded from tribe to tribe, so that a single figure might wind up hundreds of miles from the region where it was created.

A more recent theory suggests that the figures depicted death – the "all-consuming" – rather than fertility. The two need not be mutually exclusive, particularly if Cro-Magnon man had the concept of reincarnation. Deities who devour their own children, creating and destroying, are probably as old as mythology itself.

8 ICE AGE CHARACTERS



CHARACTER TYPES

Neandertal and Cro-Magnon societies are advanced enough to allow specialization among their members, who tend to fall into several distinct character types. These are listed below, along with suggested advantages, disadvantages and skills. Certain types are unlikely or impossible for characters of some races; these restrictions are noted in the section on each species. In some races, character types are more likely to be men. These are only suggestions. Players can create any type of character they want, as long as the GM allows it.

Herbalist

This character is skilled in herbal healing and the treatment of minor injuries. He (or she) may also be a shaman, using magic in conjunction with his mundane skills – this combination is more likely in later periods than earlier ones. In worlds where magic doesn't work, almost every shaman has this skill – the "magic" is just a show.

Advantages. Immunity to Disease helps keep an herbalist alive despite frequent contact with sick people. Acute Taste and Smell and Acute Vision can be helpful when identifying and preparing herbs and herbal medicines. Successful, experienced herbal healers may have improved Social Status or Reputation.

Disadvantages. Unlucky or unskilled herbalists may have a bad Reputation.

Skills. Herbalist (see p. 110) and Naturalist are required for an herbalist.

Hunter

The hunter is the most likely adventurer in an Ice Age campaign. He is usually self-sufficient, and has the freedom to leave his tribe or clan for days at a time. He is expected, however, to bring home meat on a reasonably regular basis. Older hunters or those who have been crippled might work primarily as tool and weapon makers.

Advantages. All of the Acute Senses, Alertness, Absolute Direction, Animal Guise, Camouflage, Hiking, Rapid Healing and Toughness are useful to the hunter.

Disadvantages. None are necessary, but Duty, Sense of Duty and Overconfidence are appropriate.

Skills. Naturalist, Tracking and weapons skills are essential. Also useful are Cooking (for dressing out kills), Sign Language or Gesture, Stone Knapping (see p. 110), Stealth and Survival.

Leader

Leaders are most often older, respected hunters, but on rare occasions they might be shamans instead. They lead by virtue of experience, skill, intelligence and popularity, and must be dedicated to the welfare of the tribe. A good chief views his personal welfare as secondary to that of the group he leads. NPC leaders can be built on more than a hundred points, to reflect their greater experience.

Advantages. Charisma, Luck and Voice are good leader advantages, as are Common Sense and Intuition. All leaders have High Social Status (Level 2 or 3), and most have Wealth.

Disadvantages. All tribal leaders have a Duty to the tribe worth 10 or 15 points. Good leaders have Sense of Duty as well. Age, Bully and Overconfidence are possible as well.

Skills. In addition to typical hunter skills, leaders may have Bard, Diplomacy, Fast-Talk, Intimidation, Tactics and Tracking. Leadership, of course, is a must.

Outcast

An outcast has no tribe. He is a loner, perhaps by choice, perhaps not. He may have been exiled for violating a taboo or committing a crime, or he simply might not fit into the close-knit society of the tribe. Outcasts might have any combination of skills, advantages and disadvantages within the limits set by the GM.

Advantages. Unusual Background is perfect for outcasts, as are any advantages which enhance their ability to survive alone in the wilderness.

Disadvantages. Outcast characters typically have Social Stigma for a disadvantage – outsiders are generally mistrusted by primitive tribesmen. Other disadvantages are often the reasons a character is an outcast.

Skills. Anything is possible, as long as it fits in with the character's origin. Survival, Tracking and weapons skills are essential – outcasts without them don't live very long.

Scout

Scouts are adolescent boys who are physically mature but are not yet fully trained and experienced hunters. A scout hunts small game and helps during group hunting, driving game toward the older men waiting in ambush, or tracking the movements of a

nearby herd and reporting back to the tribe. Essentially, they do the leg work, so that the hunters can concentrate on the kill. Scouts eventually become hunters.

Advantages. Absolute Direction, Alertness and Acute Senses are useful.

Disadvantages. Impulsiveness, Overconfidence and Youth would be appropriate for a scout.

Skills. The hunter skills like Survival, Tracking and weapon skills are necessary. Running might also help.

Shaman

Shamans have magical abilities relating to spirits and the spirit world. They cure illnesses, perform blessings and tell the future, among other things. They are generally well respected and powerful members of their tribes. See p. 111.

Shamans are often herbalists as well, and use herbal medicines both for curing and as part of spell-casting. In fact, where magic doesn't really work, shamans are just flashy herbalists.

Advantages. Magical Aptitude is necessary. Blessed, Charisma, Empathy and Voice are useful. High Social Status (Level 1 or 2) and Wealth are also common.

Disadvantages. None are necessary, but Epilepsy, Addiction (to hallucinogens) and Split Personality can be interesting.

Skills. Along with his spells, a shaman character would do well to take one or more of the following: Acting, Bard, Dancing, Fast-Talk, Herbalist, Hypnotism, Meditation, Sleight of Hand and Theology.

Storyteller

A storyteller is more than just an entertainer. He is a teacher and tribal historian too. Unless he is particularly old, he follows another occupation full-time, probably hunting or herbalism. Storytellers are respected, but rarely have any special benefits.

Advantages. Charisma, Eidetic Memory and Voice are ideal.

Skills. Acting, Bard, Sign Language and Teaching round out a storyteller nicely.

Advantages, Disadvantages and Skills

This section develops the character creation information already presented in the ***GURPS Basic Set***, with notes on special applications to ***Ice Age*** campaigning.

Advantages

Appearance — see p. B15

Unlike Charisma, positive reaction modifiers for appearance only apply to members of the same subspecies. Cro-Magnons might regard all Neandertals as unattractive or worse, and vice versa.

Clerical Investment — 5/10 points; see p. B19

The character is the accepted religious leader of the tribe. He leads ceremonies, conducts important rituals, and sets certain taboos. His opinion is sought in most spiritual matters, and he is accorded much respect. Only one character in a tribe or clan will have this advantage – usually the shaman, though leaders may also have this advantage. A cleric has a +1 reaction for Reputation among his tribe.

If the cleric can actually exert influence on important spirits – without using shamanic spells – this advantage is worth 10 points. If the cleric has only social and worldly influence, Investment is only worth 5 points.

Lightning Calculator — see p. B20

Most early hominids (pre-*Homo heidelbergensis*) may have been unable to count past five – the number of the fingers on one hand – or imagine periods of time longer (or shorter) than a day, with anything larger being "many." *Homo heidelbergensis* may have extended this range to ten (two hands), and had some concept of longer periods of time – lunar months, seasons, years, and "when I was young."

This advantage, available to *H. heidelbergensis,* Neandertals and Cro-Magnons only, gives the character the ability to count to ten without using a digital calculator (i.e., fingers), and perform simple addition and subtraction in the abstract ("five arrows minus two arrows equals three arrows" without needing to actually look in the quiver and count the arrows).

Literacy — see p. B17

In the absence of writing, this advantage is irrelevant to prehistoric characters.

Magical Aptitude — see p. B21

This advantage is a necessary prerequisite for shamanic spell-casting. Some races are not allowed to take this advantage, or are limited in how many levels they may take. See the racial descriptions, pp. 94-105.

Musical Ability — see p. B22

Only *H. heidelbergensis*, Neandertal and Cro-Magnon characters can make music or take this advantage.

Patron see p. B24

Patrons existed in prehistoric societies, and player characters may take a patron as an advantage if the GM allows. Prehistoric patrons were always single individuals; their value is determined normally. A young hunter might have a chieftain as a patron; an apprentice might have the tribal shaman.

Status see p. B18

Hominid society, like that of most primates, was inherently hierarchical. Even *Homo habilis* bands had dominant and subordinate members. The social hierarchy of Neandertal and Cro-Magnon communities is quite complex, and each individual has a specific place in the social order.

Status works normally, though the range of social levels is smaller. High social status has fewer advantages and disadvantages than it does in the modern world, while particularly low status has a serious effect on one's chances of survival – outcasts have a tough row to hoe. Status levels for hominid tribes are detailed on p. 112.

New Advantage

Racial Memory 15 points

You occasionally get a feeling of *déjà vu* about a place, thing, animal, etc. It's not reliable, but when it occurs you "remember" certain feelings or facts about the subject of the memory. On a successful roll against your IQ you get a vague impression – "This cave is evil . . ." A critical success gives a vivid replay of ancient ancestral memories. Nothing happens on a failed roll, and a critical failure results in a wrong impression.

This talent is totally passive. A tribesman cannot deliberately attempt to access racial memories . . . they just come to him. All rolls are made by the GM, in secret, whenever the character encounters something that might have formed a powerful memory in his ancestors.

GMs may prefer not to allow this advantage. Check to see if it is appropriate for each campaign.

DISADVANTAGES

Addiction see p. B30

Ice Age man was aware of many plants with effects similar to many modern drugs. A character may become addicted to one of these plants, which can be consumed raw, in a tea, or burned and the smoke inhaled. The point value of Addiction depends on the rarity of the plant:

If the plant is common: -5 points.

If the plant is relatively uncommon: -10 points.

If the plant is rare: -20 points.

It is up to the GM to determine just how rare a given plant is, based on factors such as growing season, location and preservability. Note that in some tribes hallucinogenic plants are considered to have magical properties, and may be an important part of the tribe's religious activity. These would be considered "legal." In other tribes, any addiction which interferes with a person's productivity is looked on very poorly.

Age see p. B27

The hominids of the Pleistocene don't live as long as modern humans. See the individual race descriptions for details (pp. 94-105).

Albinism see p. B27

The chances of an albino surviving to adulthood in prehistoric culture are low, and GMs may choose to disallow this disadvantage. In a Neandertal or Cro-Magnon society, albinism may be regarded as having spiritual significance, and be appropriate for a shaman character.

Alcoholism see p. B30

Alcohol is probably unknown to most hominid tribes, and those who do know of it don't know how to make it (alcohol does occur naturally). As a result, this disadvantage is not appropriate for a primitive character.

Appearance see p. B15

While different cultures have different standards of beauty, most would agree that hideous is hideous. Reaction modifiers for worse than average appearance should apply across species.

Dyslexia see p. B33

In the absence of a written language, Dyslexia is not worth any points as a disadvantage.

Epilepsy see p. B28

The seizures which are a part of this condition are often given spiritual significance by Pleistocene tribesmen. The epileptic character may be thought to be possessed, or in communication with the spirit world.

Fat see p. B28

Obesity would be rare in hominid societies, but it might well be regarded as attractive, or even beautiful (see *The Venus Cult*, p. 105). In this case, a weight increase of 50% would give

a reaction roll of +1 and cost no points: double normal weight would give a reaction roll of +2 by the same sex, +4 by the opposite sex, and be worth -5 points.

Short Attention Span see p. CI94
This disadvantage is appropriate for some species of early hominids.

Short Lifespan see p. CI104
Many early races have a lifespan significantly shorter than the modern average.

Social Stigma see p. B27
See *Social Status and Wealth* on p. 112 for a discussion of status levels in primitive society. Point values are the same as in the ***Basic Set.***

Uneducated see p. CI79
Any hominid species before Cro-Magnon would have this disadvantage.

Youth see p. B29
As with Age, details concerning this disadvantage are located in the racial descriptions (pp. 94-105).

SKILLS

Human society during the Ice Age is Tech Level 1 at best, and any skills which are only applicable to higher tech levels – like Guns – are not possible for primitive characters. Borderline cases are discussed below. Note that some skills have different names at this tech level!

Animal Guise (Mental/Average) see p. CI152
This skill is primarily for stalking game, though it may be used in religious or magical ceremonies by Cro-Magnon tribesmen.

Armoury/TL0 (Stone Knapping) see p. B53
At TL0, this skill is known as Stone Knapping. This is the ability to fashion tools and weapons from stone, wood and bone. It is limited by the relative technology possessed by the race; Cro-Magnon knapping, while still TL0, is far superior to earlier efforts. Metalworking and armor are unknown. A character may attempt a default roll for this skill only if he has seen it done before; at the GM's option, it may default to Archaeology or Anthropology at -4.

Axe/Mace see p. B49
This is the skill for using hafted stone axes and most clubs – which are unbalanced during this period. It is also necessary for using the hand axe as a melee weapon.

Axe Throwing see p. B49
Ice Age axes cannot be thrown effectively.

Bow and Palette see p. CI52
This is a method of fire-making which uses a wooden palette and a slender rod. In the 20th century, it is taught in some survival courses, and an archaeologist or former Boy Scout might be familiar with it.

Broadsword (Club) see p. B50
The sword does not exist in Pleistocene times, but use of the club is essentially the same skill.

Cooking see p. B53
In addition to preparing food, this skill includes the dressing out and butchering of freshly killed animals. It is also used to skin an animal in such a way as to preserve the hide's usefulness. Most hunters should have it.

First Aid see p. B56
This skill is beyond stone-age technology; use rules for simple bandaging instead. Also see *Herbalist*, below.

Flint Sparking (Physical/Easy) see p. CI152
A more primitive method for starting fires, flint sparking would also be known to fire-using primitives and possibly to ex-Scouts or commandos. Note: though everyone has heard of it, a default roll to use this skill may only be tried by someone who has seen the skill used before. Others might not even recognize flint . . . or, if they did, could spend a long time banging rocks against each other before making even one spark.

Herbalist (Mental/Hard) see p. CI150
This is the TL0 version of the Physician skill.

Hiking see p. B244
Based on HT, not DX. This skill represents training for endurance walking and hiking as well as how best to carry a pack, how to pace yourself, etc.

Knife Throwing see p. B51
Ice Age knives cannot be thrown effectively.

Leatherworking see p. B53
This skill is vitally important, and includes the knowledge of how to remove and cure hides, how to use intestines to make water-bottles, and how to shape and stitch leather of all kinds.

Languages see p. B54

All prehistoric languages are Mental/Easy skills.

In a fractured history or time travel campaign, characters may want to learn languages for which they cannot make the full range of sounds. This should be treated as a penalty of -1 to -4 to skill when trying to communicate, rather than a more difficult skill; it should not affect anyone's ability to understand others speaking the same language.

Meditation (Mental/Hard) see p. CI142

The use of Meditation by primitive shamans is purely speculative, of course, but if shamanism and even magic are accepted, meditative techniques can be expected.

Meteorology (Weather Sense) see p. B61

A tribesman with Weather Sense, the TL0 version of Meteorology, knows what to expect, in general, from the seasons, and can also detect the advent of bad weather far enough in advance to help the tribe survive.

Mimicry (Physical/Hard) see p. CI152

The ability to copy animal calls would be useful not only to hunters, but also to shamans . . . and even more to charlatans, in order to create "spirit sounds."

Pottery see p. B54

Pleistocene peoples have no knowledge of this skill.

Survival see p. B57

Almost every primitive should have this skill at a high level. The abilities it represents – finding water and gathering food in the wild, recognizing and avoiding dangerous plants and animals, finding or improvising shelter – are the stuff of day-to-day existence in the Pleistocene!

Theology (Rituals and Ceremonies) see p. B62

Rituals and Ceremonies is the TL0 name for this skill. It includes complete knowledge of not only the tribe's religious beliefs, but how to conduct its ceremonies as well. This skill is very useful for shamans, even if they aren't the tribal religious leader. At the GM's option, it may default to Archaeology or Anthropology at -4.

Throwing Stick (Physical/Easy) see p. CI136

This is the skill of using the (non-returning) throwing stick, the most common hunting weapon of primitive peoples. A well-made throwing stick, spinning in the air, can travel more than twice as far as a thrown stone, and as far as a primitive bow can shoot an arrow.

Shamanism

Magic is not a required element in a prehistoric campaign, but it adds color and dramatically increases roleplaying possibilities. Remember that all the *characters* will believe in supernatural forces. (In fact, the *players* need not even *know* whether magic works in the game – the characters should still act as though it did!)

The shaman is not merely the "village wizard" in the generic fantasy sense. He is the scientist, priest or priestess, and doctor of early human society. Only the shaman understands how the world works – the spiritual forces behind such phenomena as seasons, animal behavior, birth, death and disease. This understanding is derived from a shaman's unique ability to contact and influence the spirit world. Shamanism is an art requiring skills and knowledge, both magical and mundane, which are the exclusive domain of the practitioners. Though a shaman must have inborn ability, most learn their trade and spells from a mentor. Theology, in a prehistoric campaign, is the professional skill of the shaman.

Evil shamans exist, but they are hated and feared, and must either hide their activities or live as outcasts. However, even shamans who consider themselves "good" may have tempers and selfish ambitions, and may use their skills to give advantage to their friends or to harm foes or rivals. Thus, even the mildest and most helpful shaman will be regarded with an edge of fear.

The Role of the Shaman

Shamans perform many services for the tribe, of such importance that they are accorded great respect by everyone. A shaman may receive compensation in the form of food, tools, hides, or anything else of value. The shaman's abilities include foretelling the future, speaking with the spirits of dead or not yet born tribe members, and finding lost or stolen objects. A shaman works for the tribe to ensure bountiful food by appeasing nature spirits and compensating the spirit world for the death of the hunted prey. A shaman defends the tribe against spiritual attacks, launches attacks against the tribe's enemies, and negotiates with spirits on the tribe's behalf. He presides over the social rituals for birth, initiation and death.

The shaman is the tribe's healer, understanding both injuries and diseases caused by the invisible agents of the spirit world.

The Shaman as Performer

It is important for the tribe to know that they have a good shaman. The tribe cannot see the spirits. All they can see is the shaman himself. His energy and self-assurance, and the results of his healings and trances, are compared with other times and other shamans. Thus, virtually every shaman has some skill in the performing arts, such as Acting, Sleight of Hand and Ventriloquism skills (see pp. B62, B67-68).

A good singing voice and Acting skill enable a shaman to entertain the tribe while conducting rituals or trance work.

Charlatans

Not everyone who claims to be a shaman has magical powers . . . or even thinks he does. If the GM decides that magic is not "real" in the campaign, performance skills become even more vital to the shaman. The effectiveness of his cures, as well as his social position, depend on the quality of his performances.

Just because shamans don't actually have supernatural powers, that doesn't mean they are ineffective. Many anthropologists consider shamanism to be, among other things, primitive psychotherapy. A tribesman may believe that he is possessed, or that he has sinned, or is under spiritual attack. This creates a psychosomatic illness . . . and, if the victim believes in the shaman, then the shaman's rituals can cure him. (And "real" treatments, unaccompanied by a convincing ritual, would be useless!)

And even in a world where magic is real, there will still be fakes. These individuals must be very talented to survive, and their performing secrets will be closely guarded. They will be very careful to accept only patients who are likely to recover anyway . . . and their skill with diagnosis and herbal medicines may be superior to that of "real" shamans. But they will always have a ready excuse for failure – "He has violated a taboo and kept it a secret," or "The evil thoughts of someone here are fighting against my spell." If worse comes to worst, the charlatan can be humble: "I do not know if my meager powers are enough to drive out such strong evil!"

Shamanic Magic in the Game

GURPS Religion discusses shamanism in detail and describes many appropriate spells. Or the GM may use the spells from the ***GURPS Basic Set*** and other ***GURPS*** supplements, adding and modifying as appropriate for a primitive shaman. Or another magic system can be introduced, either structured or free-form. It's entirely up to the GM.

Whatever the system used, the GM must be both creative and flexible. He will often be called on to improvise, describing NPCs' theories of magic and various visions of the spirit world. This is true even if he decides that magic does not really exist. If the GM makes all "magic" rolls in secret, and tells the players what their characters perceive, they can remain in appropriate ignorance throughout the campaign. Did the shaman really see a vision, or just a hallucination brought on by exhaustion . . . or did he make the whole thing up? Would they have killed the mammoth so easily without that blessed spearpoint? The players may wonder . . . but the *characters* will know that magic is real.

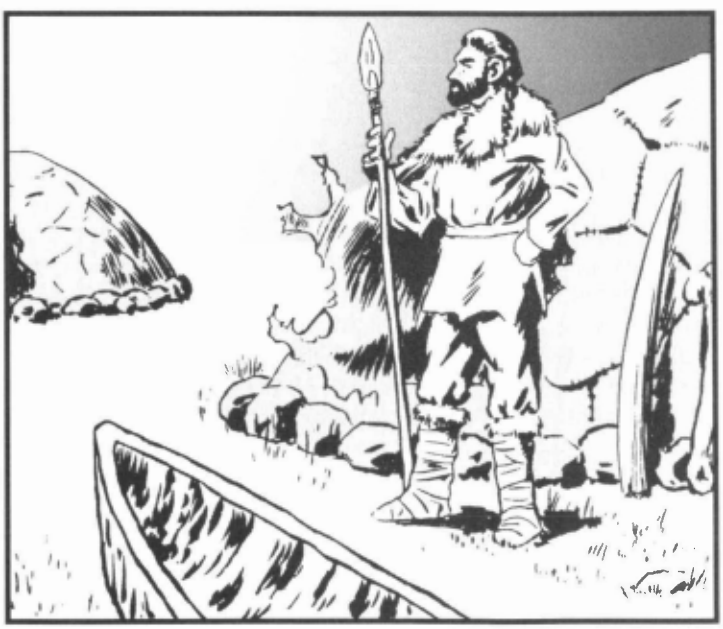
The general rule: Preserve game balance, but make it fun. Spells must not short-circuit the adventure . . . but creative use of magic should be encouraged.

Social Status and Wealth

Status and wealth are important factors in the lives of Pleistocene humans, though their significance is diminished for earlier hominids. In a stone-age tribe, high social status means greater responsibilities along with increased privileges. "Wealth" means property, since there is no money. Individuals with high status may have more possessions, but not always.

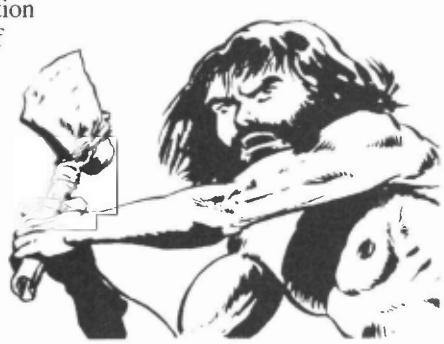
Status levels for a typical Neandertal or Cro-Magnon tribe are: outcasts (-3), handicapped persons (-1), adolescents and women (0), hunters (1), shamans and elders (2), and chiefs (3). In general, outcasts are either Poor or Dead Broke, handicapped individuals are Poor, women and adolescents are Struggling or Average, hunters are Average or Comfortable, and chiefs and shamans are Comfortable or better.

Average Wealth is 40 $kins (see *Economy*, p. 86) with which to buy clothing and equipment. Tribesmen may pool part of their wealth to buy tribe-owned goods like caves, shelters or canoes. Note that many PCs have the skills necessary to sit down and make the things that they want. The cost in $kins is approximately equal to the hours of time needed to make the item, assuming that the materials are available. (Some materials – good flint, for instance – are not always easy to find.) If a craftsman wants to sit down and make a spear, he misses a half-day's hunting or gathering . . . which means he will have to persuade someone else to share their food. In good times, this is no problem. In lean times, the tribe may need to spend every waking hour finding food, especially since sun-dried meat and berries are probably the absolute limit of their ability to preserve food against times of scarcity!



Jobs and Income

"Jobs" in the Pleistocene basically follow the character types listed on pp. 107-108. The table below gives monthly surplus income for each occupation – this assumes "cost of living," (e.g., food) is accounted for already. Should someone have to trade for food, he might pay 8 to 12 $kins per day's rations . . . because it takes, on the average, 8 to 12 hours to find a day's food.



Job Table

Job	*Required Skills*	*Income (in $kins)*
Gatherer	Survival 10+	10
Herbalist	Herbalist 14+	20
Hunter	Tracking 13+, weapon 11+	15
Leader	Leadership 12+, Tracking 12+	30
Mother	Cooking 10+	5
Outcast	Survival, Tracking, weapon 12+	10
Scout	Tracking 11+, weapon 10+	10
Shaman	IQ 12+, Spells or Herbalist	20
Storyteller	Bard 11+, Teaching 11+	10

Success rolls are not provided because failing at your "job" usually means death or exile, events which should be played out.

EQUIPMENT

Pleistocene equipment is all TL0. Cost of items reflects the time needed to make them. Objects which require skilled craftsmanship or uncommon materials are prized, especially since so much time is required just to get food. A dozen needles would be worth a Pleistocene fortune.

Living Quarters	*$kins*	*Weight*
Tent, per occupant	10	6
Hut, per occupant	12	n/a
Dry cave, per occupant	15	n/a

Clothing	*$kins*	*Weight*
Loincloth	2	–
Tunic	5	2
Boots (foot wrappings)	5	2
Leggings	3	2
Mittens	4	–
Cloak (fur)	2	3
Coat with hood	5	6
Sleeping furs	3	8
Jewelry	3 and up	–

Tools and Other Goods	*$kins*	*Weight*
One day's dried rations	8 to 12	3
Borer	3	1
Flint sparker	1	1
Bow and Palette	4	½
Burin (engraver)	3	–
Stone scraper	3	1
Portable art object	6+	–
Fishhook or needle	8	–
Thread, 10 yards (sinew)	3	–
Cord, 10 yards	2	½
Bowl, wood or bone	3	1
Oil lamp	6	1
Pouch or sack	2+	½ and up
Waterskin	4	1
Sledge	12	40
Dugout canoe, 3-man	100	200+

Weapon Table

This is the complete weapons list for Pleistocene campaigns; other weapons are not available unless tribesmen have made contact with a more advanced culture.

In some cases, the statistics given here differ from those for weapons of the same name in the ***Basic Set***, because many primitive weapons are less effective.

In terms of breakage, stone blades and points are considered "cheap," while stone axes, and wooden and other weapons, are considered "average." This does not affect price. Note also that even a "cheap" metal weapon from a more advanced culture is superior to a stone point in that a broken metal weapon can be reforged and reshaped, while broken stone is worthless.

Hand Weapons

Weapon (skill)	*Type*	*Damage*	*Reach*	*Cost*	*Weight*	*Min ST*	*Notes*
Stone knife (Knife)	cut	sw-3	C, 1	3	½	–	Cannot parry; Max damage 1d+1
Hand axe (Knife)	cut	sw-1	C	3	1½	6	Cannot parry.
Club (Broadsword)	cr	sw+1	1	1	3	10	Balanced
War Club (Axe/Mace)	cr	sw+2	1	2	4	11	1 turn to ready after use
Two-handed club or "maul" (Two-handed Axe/Mace)	cr	sw+4	1, 2	2	12	14	2-handed. 1 turn to ready
Hafted Axe (Axe/Mace)	cut	sw+1	1	5	4	12	1 turn to ready after use
Two-handed axe (Two-handed Axe/Mace)	cut	sw+3	1, 2	10	8	13	2-handed. 1 turn to ready
Short wooden spear (Spear)	imp	thr-1	1	1	2	–	Any spear does +1 damage if it
Fire-hardened spear (Spear)	imp	thr	1, 2	2	3	8	is either used two-handed
Early stone-tipped spear (Spear)	imp	thr+1	1, 2	5	4	9	or thrown.
Late stone-tipped spear (Spear)	imp	thr+2	1, 2	5	4	9	This is the Cro-Magnon weapon.

Ranged Weapons

Weapon	*Type*	*Damage*	*Ranges*				*Cost*	*Wt.*	*Min ST*	*Notes*
			SS	*Acc*	*½Dam*	*Max*				
Blowpipe	Special	–	10	1	–	ST×4	3	1	–	See p. B49
Bolas	cr	thr-1	12	0	–	ST×3	3	2	–	See p. B49
Bow	imp	thr-1	12	1	ST×5	ST×10	3	2	7	Max damage 1d+2
Arrowhead								2		Stone; likely to break
Arrow shaft								2		Fletched with feathers
Spear	imp	varies	11	2	ST	ST×1.5	varies	varies	9	Damage depends on type; see above
Spear Thrower										Increases user's effective ST by 5 when throwing a spear
Throwing Stick	cr	sw+1	11	2	ST×6	ST×10	10	1	7	See pp. 111, CI136.

ARMOR

During the Pleistocene, people do not deliberately make or wear armor, but the furs they wear will give some incidental protection. One layer of thick fur – bear, for instance – or well-tanned leather has a passive defense of 1 and a damage resistance of 1. A single layer of a lighter fur or leather, such as deerskin, gives no PD and a DR of only 1. Layering furs increases DR but does nothing to improve PD.

There are two ways to outfit a character with clothing. The first is to simply assume there are three basic levels of protection: light, medium and heavy furs. These provide a set PD and DR, and are considered to cover the entire body for the sake of convenience. Light furs offer no PD and a DR of 1. They weigh 5 pounds. Medium furs have a PD of 1, a DR of 1 and weigh 9 lbs. Heavy furs provide PD 1, DR 2 and weigh 12 lbs.

Light furs consist of a loincloth, a cloak, and boots. The above, plus a tunic and leggings, make up medium furs. Heavy furs include all of the clothing described below except the cloak or poncho.

The second, more realistic option is to select clothing by the piece, each one covering a specific area. The total level of protection for any one area must be figured separately, taking layering into account (see p. B109 for information on hit locations). The various items of clothing, their protective value, and the areas they cover, are discussed below.

Loincloth. This is simply a soft pelt which covers the groin, and is held in place by a leather thong around the waist. It offers a DR of 1 to shots to the belly and groin – area 11 (on the diagram on p. B211). The weight is negligible.

Cloak or Poncho. These items are light furs which cover the torso. The cloak has PD and DR 1 from behind only, as the wearer can't fight with it wrapped around him. A poncho provides the same protection, but covers areas 9, 10, 11 and 17-18. Either weighs about 3 lbs.

Boots. These are not heavy soled footwear, but strips of hide wrapped around the feet and ankles and held on by leather thongs. The wrappings protect the feet (15, 16) with DR 1, but they wear out very quickly. Boots weigh 2 lbs.

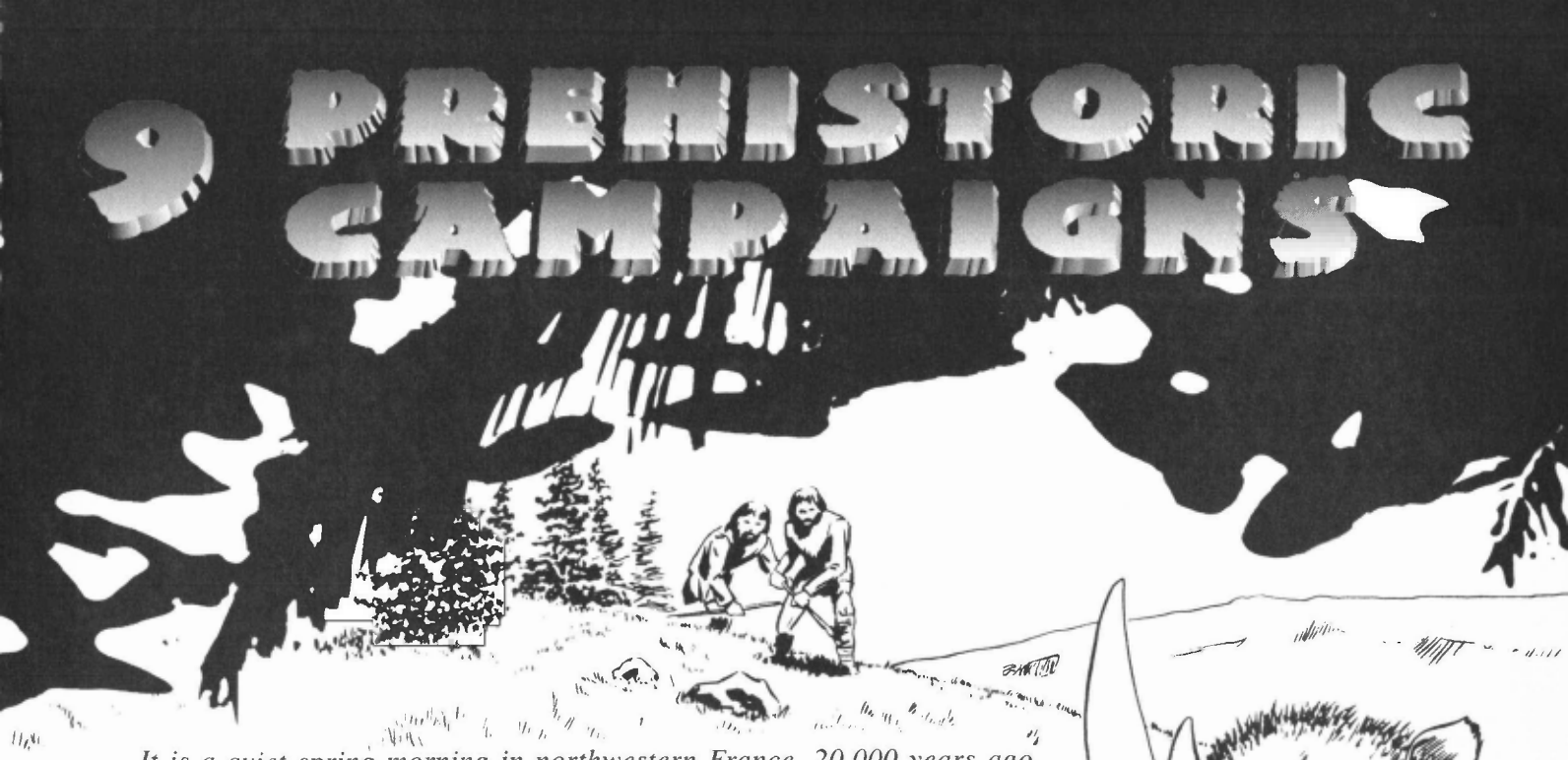
Tunic. A tunic is a sleeveless garment made from light furs or leather. It has a DR of 1, no PD, covers areas 9, 10, possibly 11 and 17-18. It weighs 2 lbs.

Leggings. Soft pelts covering the legs are kept on by leather thongs wound over them and around the legs. The PD and DR of leggings are 1, covering areas 12 (right leg), 13-14 (left leg) and weighing 2 lbs.

Coat. A coat is made from heavy fur, and covers areas 6, 8, 9, 10 and 17-18. It has a PD and DR of 1 and weighs 6 lbs. It may have a hood attached, protecting areas 3, 4 and 5 (back only).

Mittens. These loose wrappings are not likely to be worn if a weapon is being used, since they cause a -2 penalty to all weapon skill rolls. They do provide a DR of 1, however, covering area 7. The weight is negligible.

9 PREHISTORIC CAMPAIGNS



It is a quiet spring morning in northwestern France, 20,000 years ago. Although the sun has been up for over an hour, the temperature is only a few degrees above freezing. As you walk along a windswept ridge, you can see the glaciers shimmering on the northern horizon – a reminder that the relative warmth of summer is a fleeting thing. As you reach the end of the long, finger-like ridge, itself a product of the towering ice, you see your goal in the broad river valley below. You've been tracking the wooly rhino for two days, ever since it was wounded by a well-thrown spear. From the cover of a stunted pine tree, you can see the broken shaft still lodged in its shoulder. You thank the spirits that you found it before the wolves did. Your tribe needs the meat.

Motioning for your companion to join you, you smear some of the rhino's fresh dung on your clothing to disguise your scent – the beast's eyesight is poor but its nose is keen. After carefully circling downwind of your prey, you and your cousin begin to creep closer. The third hunter, your mate's brother, is waiting on the animal's opposite side, a good distance away. You'll have to surround it to keep it from escaping again.

At thirty paces, you stop to fit a javelin into your spear thrower. As you continue your approach, the rhino brings its head up suddenly and snorts. Seizing the moment, you leap out of the grass and hurl your javelin. It strikes the rhino's back and sticks there, but your cousin's spear flies wide. The wounded animal turns to run, but is intercepted by the third hunter, who is shouting at the top of his lungs and waving his spear. The confused beast turns once again and charges toward you. You move quickly sideways but it veers as well, lowering its head to make use of the 18-inch horn on its snout. You hear the others shouting, and know they are hurling their weapons at the beast. At the last moment you sidestep and thrust your last spear with all your might. You feel the point bite deep just as the rhino's shoulder strikes you and sends you rolling into a shallow, ice-cold stream.

Dazed and sore, you sit up and take inventory – nothing broken or gashed. You were lucky this time. About ten yards away the wounded rhino is trying to rise, with four spear shafts protruding from its body. As you regain your breath, the others move in quickly and finish the kill. Tonight you'll eat well, and in three days so will the tribe. You smile.

THE LOST-REALM PLOT

The classic lost-world tale revolves around a party of explorers who stumble upon a hidden valley, cavern, plateau or city in some remote part of the Earth. There is always a good vs. evil conflict in the lost world, and it falls to the explorers to save the Good Guys from the Bad Guys and their nefarious schemes. Somewhere along the way one of the party, usually the hero, falls in love with a native girl of extraordinary beauty. She, of course, gets kidnapped and rescued several times. Feel free to add the inevitable native guides, warriors, princesses and evil shamans.

Or play a typical Lost Realm adventure from the caveman's point of view. The safari, the conflict and the romance are still there, but all of the PCs are Neandertals or Cro-Magnons. It can be quite a challenge to remain in a Stone-Age character when someone nearby is firing a submachine gun. Just remember that Stone-Age characters will never be able to understand more than a tiny fraction of the explorers' modern technology. They will regard it as powerful magic to be feared.

This chapter discusses prehistoric campaigns, from time travel in the Mesozoic to cavemen surviving the Ice Age . . . even prehistoric slapstick!

TIME TRAVEL

The Mesozoic has obvious attractions for time travelers. The weather is tropical, the atmosphere unpolluted and rich in oxygen, the hunting and fishing fantastic, and the chances of killing one of our direct ancestors fairly slim (as long as the cat stays home). Better still, it's nearly 180 million years long, so getting a good spot away from the crowds isn't likely to be a problem. Spectacle-lovers will want to stay a bit longer and see the K-T meteor strike and its effects (from the safety of a force-field bubble, of course), or jump forward to the Miocene to witness the flooding of the Mediterranean. Suggestions for ***Time Travel*** adventures are given in the sidebars on pp. 121-122.

Time Windows (pp. TT51) and/or the "Oscillating Time" theory (p. TT46) can also be used to send time travelers to prehistoric times. Time may be warped, rather like a gravity well, so that the easiest way to reach (say) the 19th century is to go to the Jurassic and wait a few hours for a Window to open there/then, making the return journey via the Pliocene.

The Mental Projection method of time travel (p. TT64-65) can give players the chance to play dinosaurs with human intelligence. Dromaeosaurs, raptors and troodonts have stereoscopic vision and sufficiently nimble hands to do some human-type work, but what can compare with the thrill of being a *Tyrannosaurus* or *Quetzalcoatlus* for a few days? In a sufficiently advanced (and strange) future culture, tyrannosaur vs. ceratopsian or ankylosaur may even become a favorite method of dueling. Psionic time travelers may also visit the Pleistocene, where they will have TL7+ knowledge but only TL0 resources: any of the scenarios for a prehistoric campaign (p. 118) can be adapted for retrogressing anthropologists.

Time travelers who arrive in the Mesozoic or the Riss Ice Age naked and unarmed will need plenty of survival and stealth skills. For a really strange ***Martial Arts*** adventure, try sending a party of cinematic Shaolin or Ninja using the time-travel drug Gajuki (pp. TT76-79) to trade kicks with packs of *Deinonychus*.

GMs will have to decide how difficult it is to change time. It may be that the periodic Great Extinctions and other events cancel out most changes that the PCs can make, even if they prematurely kill the last tyrannosaur or teach the Neandertals how to make gunpowder (entirely possible). On the other hand, they may inadvertently change history by stepping on a Cretaceous butterfly, as in Ray Bradbury's "A Sound of Thunder." Consider the effect on some future society if they find a sneaker print in the Burgess Shale, or bullets in a frozen Siberian mammoth. The GM may prefer to assume that time is fixed, or that PCs are really visiting a parallel world. See Chapters 3 and 7 of ***GURPS Time Travel*** for more details.

LOST REALMS

A "lost realm" is a place where the dinosaurs and/or other extinct species survived. In a lost realm, anything that is ecologically sustainable for a few million years is possible: e.g., tyrannosaurs will need large prey, the prey will need food of its own, and so on. Remember that it takes more than 50 individuals to

keep a species viable, and that a five-ton warm-blooded *T. rex* eats 150 tons of meat per year: a breeding population would devour the equivalent of seven hadrosaurs daily. Multiply that by 65 million years, and it's clear that the larger a lost realm is, the better. The other problem with "lost realms" is that dinosaurs evolved rather quickly, with most species lasting only two to six million years. If we did stumble onto a huge Central African plateau full of dinosaurs, the species would probably be new and surprising.

Lost realms often support a remnant of some vanished civilization. Romans, Greeks, Aztecs, Mayans, Incas, Vikings and Egyptians are all good choices, as are intelligent reptilians or *Homo erectus.* This gives PCs a chance to play natives of a lost realm, or its high-tech discoverers.

Technology, as well as biology, may have evolved differently in lost realms; the Yilane, in Harry Harrison's "Eden" series, have mastered genetic engineering but not metallurgy. In a high-mana lost realm, magic may have survived, with alchemy and astrology taught in schools and the philosopher's stone cheaper than iron or gunpowder . . .

Possible settings for lost realm adventures include:

The Hidden Valley

Or island, or plateau, or anywhere on Earth isolated from modern man and the normal flow of evolution. Hidden valleys are best suited to "historical" settings when new lands are still being discovered – such as a ***Cliffhangers, Old West,*** or ***Swashbucklers*** campaign. Perhaps unfortunately, only very small areas of Earth still remain unexplored. PCs searching for oil or diamonds in the 1990s might encounter a surviving colony of dwarf sauropods (Mokole-Mbembe) in Central Africa, or *Gigantopithecus* (Yeti) in the Himalayas and Siberia . . . but hiding an entire Mesozoic ecology on the Earth's surface today would be as difficult as losing a *Tyrannosaurus* in Central Park.

Another advantage of setting the hidden valley in the past is that PCs from lower tech levels won't have access to such modern "dinosaur-killers" as miniguns, .50 caliber rifles, and RPG-7s: a party armed only with flintlocks or Colt .45s is much more likely to treat dinosaurs with the respect they deserve.

In a Fantasy or other low-tech campaign, the "hidden valley" might be an entire lost continent, ruled by Reptile-Men on war-triceratops.

For a "hidden valley" adventure seed, see *The World Well Lost*, p. 124.

The Hollow Earth

The campaign is set either inside of an enormous cavern lit by phosphorescent moss or inside the hollow earth where the inner crust is habitable (as in Burroughs' "Pellucidar" novels). As with the hidden valley, the inhabitants of this under/inner world should be drawn mostly from history, although there is room for a few of the GM's own creations as well. It is necessary to have a rationale explaining how the plants and animals of the world survive. They'll need heat, light, rain, etc. It may not seem important to the plot, but it's a sure bet that the players will want to know.

This area should be large enough to accommodate a long-term campaign and just about any amount of exploring. Again, a Hollow Earth is better suited to historical settings when the idea was still widely believed.

AFTER THE HOLOCAUST: THE NEXT ICE AGE

A primitive campaign can be post-historic rather than prehistoric. The characters are the many-generations-removed descendants of the survivors of an atomic war or other holocaust. As Einstein said: "There is no telling what weapons will be used in World War III, but World War IV will be fought with sticks and stones."

The tribesfolk may have legends of the Old Ones who made the world, fought among themselves and then went away, leaving their huge ruined cities and mysterious, dangerous artifacts behind. But it is also possible that the disaster was so long ago that there are no such legends. In that case, the players should believe that they are in a prehistoric campaign, and the discovery of an ancient city or weapons cache will be a major turn in the plot.

Characters should be built on the Cro-Magnon pattern. The other hominid races can be used as devolved or mutated humans. And, if war was followed by nuclear winter, the glaciers will certainly be back, and perhaps new versions of mammoths and sabertooths will have evolved! This is a favorite scenario for B-movies, from Roger Corman's *Teenage Cavemen* to Troma's *A Nymphoid Barbarian in Dinosaur Hell.*

DINOSAUR DISCOVERIES, BY DECADE

Examples of most dinosaur families had been described before 1930: even *Deinonychus*, discovered in 1964, would be identifiable to a 1930s or 1950s paleontologist as a larger relative of *Dromaeosaurus* (first described in 1922) – though the large claws and rigid tail would still be a surprise. The movie-going public would recognize *Tyrannosaurus*, *Allosaurus*, *Pteranodon* and *Brontosaurus* from films such as 1925's *The Lost World* and 1933's *King Kong*.

An ***Old West*** or Victorian-era PC with a scientific education would be familiar with dinosaurs (the word was coined in 1842) including *Iguanodon*, *Megalosaurus* and *Hadrosaurus*, and possibly *Triceratops* (discovered in 1889) . . . but most 19th-century naturalists imagined dinosaurs as sprawling quadrupeds, and would be utterly astounded by *Utahraptor* and *Tyrannosaurus*.

A compromise between a full-scale Hollow Earth and the Hidden Valley would be a great ice-cave in a remote, frozen area. The ice is translucent enough that arctic plants can grow inside, but it resembles perpetual cloud-cover; the stars are invisible, the sun and moon pale ghosts. From the outside, it is totally opaque. This would be a good setting for a Pleistocene lost realm, complete with mammoths, cave bears, and Neandertal shamans uttering dire warnings about the "world beyond the clouds."

Jurassic Ark

Instead of setting a lost-realms campaign somewhere on or in the earth, it can be on another planet entirely. Alien worlds can be populated with anything the GM desires, and a lot can be blamed on convergence or parallel evolution. Alternatively, an alien world may have been deliberately seeded with prehistoric Terran life forms by an alien race as a means of preserving them (as in Robert Sawyer's "Quintaglio" trilogy). This ark may be as small as a hollowed-out asteroid, or as large as a complete Earth – perhaps with different continents populated with life forms from different eras (a Pliocene Africa, a Cretaceous North America, etc.). Some worlds may include historic human cultures, carefully isolated: Shogunate Japan would be ideal. Space arks may be intended as museums, safari parks, or antiques in some alien's collection: the PCs may be astronauts discovering the world, or "exhibits."

Parallel Dimensions and Alternate Worlds

Like the space ark, one of the great advantages of an alternate world as a lost realm is its sheer size. Alternate worlds may be "mirror dimensions," showing Earth as it was at different times, or "parallels" where one or more of the great extinctions happened differently. Humanity, as we know it, may never have emerged at all: instead, the dominant species may have descended from dinosaurs (see *The United States of Lizardia*, p. TT94), or cats, or *Gigantopithecus*. Alternatively, man and dinosaur may have evolved together: imagine an Old West campaign with cowboys herding *Maiasaura* or *Pentaceratops*, or Roman gladiators facing *Utahraptor*.

Some "Weird Parallels" may even have different laws of physics: a dinosaur-dominated world where chemical explosives don't work would be an excellent setting for sword-and-saurian adventures.

THE ICE AGE CAMPAIGN

From a modern perspective, a stone-age tribesman has very limited options. But an Ice Age campaign offers many opportunities for real roleplaying. The PCs will be people of a very different kind. They have different needs and goals, but they're still people. Their interactions with each other and with the rest of the tribe mirror all of modern life, and may even provide players with some new insights about their own behavior! And where else can the players get an excuse to shout "Og, kill!" and beat their chests?

The realistic campaign is set on Earth, sometime in its prehistoric past. The creatures of the game world really existed at some point during human pre-history, and the peoples, their technology, and their culture are accurately represented, within the limits of our current knowledge and the GM's imagination. The film *Quest for Fire* and the novels *Clan of the Cave Bear* and *Dance of the Tiger* show that a fictional Ice Age can be packed with action and adventure.

The first decision a GM must make, obviously, is in what period the campaign will be set. The factors in this decision are the levels of culture and technology he wants the characters to have. Will they know how to make fire, be capable of speech and create advanced tools? Do they have a religion? The later the period, the more advanced the society will be. Cro-Magnon man, as the most modern of the hominids, will be easier for players to identify with and roleplay. It is also easier to maintain an ongoing campaign if it is set in a more recent era. Having players grunting and gesturing at one another is amusing for a while, but eventually becomes boring.

Another factor to consider is what races the GM wants to have coexisting in his game world. He can always make this decision arbitrarily, ignoring the archaeological evidence. This is just fine. However, he may want to stick to the facts a little more closely. There are two periods during which several hominid species lived side by side in a single region. The first was around 1.5 million years ago, give or take 100,000. During this period it is plausible that *P. robustus, P. boisei, H. habilis* and *H. ergaster* all coexisted on the African savannah. They would have competed for food, and, when it was scarce, the members of genus *Homo* would have eaten the australopithecines. Bands would have undoubtedly staked out their territories and defended them jealously.

The second period occurred between 32,000 and 40,000 years ago in Pleistocene Europe. This was during the height of the Wurm glacial period, and much of northern and central Europe was covered with ice. This short time span saw the arrival of fully modern man, represented by Cro-Magnon, and the disappearance of Neandertal. And, if the theory that Neandertal was an evolutionary dead end is true, an archaic form of *Homo sapiens* may have been present as well. Some have theorized that an "invasion" of genocidal Cro-Magnons wiped out the Neandertal; others argue that he was assimilated into the new population, and still others that he was driven into less-hospitable lands, where he slowly starved. The roleplaying opportunities here should be obvious.

Once the GM has decided when and where to set his campaign, fleshing out the world will be relatively easy.

Technology and Culture

Perhaps the greatest difficulty in a realistic stone age campaign is that the players will attempt to use their 20th-century knowledge to benefit their characters. A GM must keep a firm handle on new inventions, ideas and cultural innovations the players may try to implement. It took millions of years for mankind to reach his current level of development. If the PCs invent the wheel, agriculture, domestication and the sailboat in a few weeks, things are sure to fall apart.

CAMPAIGN IN SPACE: THE DRAGON REALM

Tau Draconis is a G2 V star in undisputed Nexa territory west of the Saga Sector (see ***GURPS Space Atlas 4***). Its third planet was terraformed by the Precursors into a near-perfect copy of Earth, with minor changes: the North Pole is near Moscow, leaving North America ice-free while Europe is overrun by glaciers; Central America is a string of islands; India is 200 miles south of Nepal, and Japan 500 miles west of China; the air is 24% oxygen, and industrial metals are almost entirely absent from the surface (except in Japan).

North America and India are populated by late Cretaceous species. Jurassic animals rule South America. *Homo habilis* competes with *Paranthropus robustus* in Africa; Cro-Magnons and Neandertals hunt mammoth in Europe; and *Homo erectus* still lives in southeast Asia. *Gigantopithecus, Andrewsarchus, Indricotherium* and other mammals from the Tertiary survive in India. Modern humans in Japan are re-living the early Kamakura Era (see ***GURPS Japan***), with a strict death penalty for anyone who sails out of sight of land into "The Dragon Realm."

The PCs learn of Tau Draconis III when a vodkaholic Kinski tells them about a Nexa prison planet for humans. If the PCs go there to investigate, the Precursor-built security systems will cripple their ship. To escape, they will have to find the Precursors' control room, defend themselves against the inhabitants, and perhaps discover why the world was created.

Communication between modern and prehistoric humans will be very difficult; gestures which the explorers intend to mean "My three friends are going over that hill tomorrow morning to retrieve their spacesuits," can easily be misinterpreted by Neandertals as "Please strangle my three companions after the sun rises."

MEN OF STONE

A ***Supers*** campaign set in the stone age is quite possible, if rather mind-boggling. Modern or future supers might be trapped in prehistory by a time-warp, or a solar flare might activate repressed power traits in Cro-Magnons and Neandertals. The old Hanna-Barbara cartoon *The Mighty Mightor* featured a flying, club-wielding, cape-and-cowl-clad meta-Cro-Magnon opposing rogue dinosaurs, bizarre alien tribes, and other menaces. Note that it would be about as difficult for a TL0 gadgeteer to produce a working jeep or revolver out of stone knives and bearskins as it would be for his modern-day equivalent to suddenly whip up a force shield and contragravity belt.

Talk to the players before play begins, and lay down some ground rules. Make sure they understand the social and technical level of the races they are playing, and emphasize that roleplaying is very important. Warn them that there will be stiff penalties to experience earned for someone dropping out of character and using knowledge that his Neandertal hunter shouldn't have.

Be careful, however, not to discourage the players from being innovative. Being the *Homo erectus* to discover how to make fire is one of the great thrills of roleplaying prehistory. But the GM must emphasize that these events will come about slowly, in the context of the game, and not just as a convenient means to achieving a short term goal. Indeed, discovering the secret of making fire might be the climax of a long-running campaign.

If the players insist on introducing inappropriate technology or behavior, let them. They'll have to pay the consequences, however. Their fellow tribesmen will be unable to comprehend their invention, or will consider their strange ideas and behavior to be sure signs of demonic possession. If the PCs remain stubborn to the end they might even be exiled for their "crimes."

The ultimate rule of thumb for the GM plagued with Renaissance cavemen is: If all else fails, just say, "No!"

Magic and Shamanism

Magic and shamanism (p. 111) can easily be a part of a prehistoric campaign.

Neandertal and Cro-Magnon tribes certainly had their shamans, and these peoples believed in the spirit powers that the shamans claimed to wield. Whether or not the power exists is entirely up to the GM, and he doesn't have to tell the players when he makes up his mind. If they're good roleplayers, their *characters* will be believers. Maybe magic did work back then, but doesn't any more; or maybe it still does, if a person knows how to call the spirits to his aid.

Campaign Themes

The next hurdle is to decide what type of adventures to run. There's nothing wrong with a campaign which consists of independent and unrelated episodes, but one built around a central theme is often more satisfying. Below are a number of suggestions for campaigns, which can also serve as the basis for a single adventure. These are by no means the only possibilities, just some of the more obvious ones.

Man Against Nature

This campaign plays out the daily struggle for survival. The player characters must constantly fight to keep themselves and the tribe alive. They will have to contend with ferocious predators, elusive prey, droughts and blizzards, volcanic eruptions and rival tribes. A single adventure might consist of a mastodon hunt, during which the hunters are attacked by a sabertooth, caught in a storm, and nearly trampled by stampeding bison. Once they've made the kill, they'll have to fend off the wolves and hyenas which will quickly gather.

A continuing Man Against Nature campaign could feature a tribe which survives by hunting reindeer, which they follow across the arctic plains from the northern glaciers in summer to the southern coastal plains in winter. Of course, they won't be the only predators . . .

The Man Against Nature theme can make an entertaining mini-campaign, or an introduction to the genre as a whole. It is also particularly well suited to the

more primitive species which don't have well-developed cultures to provide roleplaying opportunities. If the players want more, it's time to liven things up with one of the ideas below.

First Contact

One of the staples of prehistoric adventure is the meeting of other, different tribes. Strangers might be encountered when the tribe moves into a new region . . . or perhaps they invade the tribe's home territory. Often the strange new tribe is more advanced than the one to which the characters belong. It will always be distinct in some respect.

GMs should emphasize the differences in the two tribes. Play up different customs, religions, totems and technologies. One side may be more advanced, but make sure that each tribe can learn something from the another. GMs may want to have PCs from each tribe, and let the players roleplay these differences. Don't miss the opportunity to have characters from one tribe give grave insult to members of the other because they don't understand their customs.

The usual plot for the First Contact campaign involves initial conflict, fear and mistrust which must be resolved. Often, the two tribes will be on the verge of open warfare when the characters succeed in bringing everybody together, perhaps to unite against some common threat posed by another tribe or impending natural disaster. There might be one or two truly dastardly NPCs who are sowing seeds of dissent and must be dealt with. The campaign ends with the tribes developing a strong, mutually beneficial, friendship.

Of course, things might not work out . . .

Warring Tribes

The Warring Tribes campaign provides a clear-cut human opponent for the characters to overcome, and lots of straight combat. The Bad Guys are greedy and violent, and the Good Guys noble and justified. Perhaps the evil tribesmen are cannibals or have some other particularly nasty habit. Warn the players to build characters with an emphasis on combat skills rather than survival skills, or they'll wind up with a lot of corpses – remember, these people won't have much in the way of armor.

Some common plot devices are kidnapped children, mates, friends, shaman, leader, etc.; the desecration of holy places; slavery; and cannibalism (either as part of a ritual, or just for food). The first adventure should include a sudden, unexpected attack by the strangers. After fighting them off, the tribe will have to discover the nature of the enemy, rescue any captives (which could get some of the PCs captured), and defeat them utterly to ensure the safety of the tribe. This kind of campaign is ideal for the evil shaman – if the players like battling black magic and witchcraft, here's the chance to let them do it.

In the end, the characters' tribe should probably win, but make sure the outcome is enough in doubt that the climactic battle isn't dull. This is a good time for that

PALEOZOIC ADVENTURES

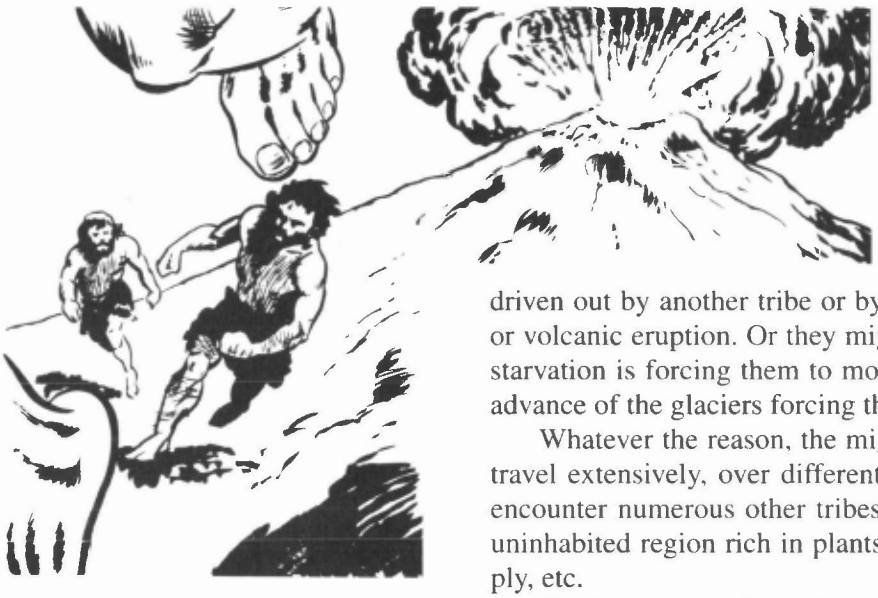
Waiting for God

Eugene Pickett, self-styled prophet and new spiritual leader of the Church of New Beginnings, has long been a figure of fun at Time Tours Ltd. for trying to calculate the times and places where God has physically manifested on Earth (the burning bush, strolling through Eden, etc.). But they stop laughing when Pickett's followers hijack a time machine and take it back to the Precambrian, waiting for the sudden appearance of grass. The faithful are wearing heat suits (they don't expect the sun to be created until the next day), but no breathing gear – and the atmosphere is low on oxygen and rich in CO_2. If the PCs don't find them, it'll take a miracle to save them from slow suffocation . . .

Alternatively, Pickett's followers could aim for one of the great extinctions, expecting a flood, with no protection but umbrellas and inflatable rafts. Or they might head for the Mesozoic believing that all animals that lived before Eve were herbivorous . . . including *Tyrannosaurus rex*.

Cambrian Explosions

Infinity sends a probe to a "dead world" used as a dumping ground for radioactive wastes, and discovers what might be new life-forms emerging. Biologists want the world reserved for study, but the Mafia-controlled Bermuda Holdings doesn't want to sell. The PCs are sent there for a more thorough survey, and discover that BH has been dumping some very strange things there – and even stranger things have evolved to eat them. BH, of course, will do what it can to stop them making a full report . . .



MESOZOIC ADVENTURES

The Wild Hunt

The Mesozoic is a paradise for big-game hunters – and, if any restrictions are placed on hunting, for poachers. Hunters and poachers will also love the Cenozoic, with its mammoth ivory and sabertooth furs. Zoos and aquaria are fussier – they want interesting animals brought back *alive*.

Time-traveling PCs may serve as guides for hunting parties, rangers patrolling for heavily-armed poachers, bounty-hunters searching for escapees hiding in the past, or police trying to keep hunters and anti-hunting demonstrators apart (or trying to solve a murder when the victim's been eaten by a *T. rex* or trampled by a *Seismosaurus*). They may even encounter hunters from other times – or other planets, à la *Predator*.

The Grim Ripper

A *Deinonychus* or *Troodon* gets into a time machine and escapes in London's Spitalfields on September 30, 1888 – the night Jack the Ripper murdered Liz Stride and Catherine Eddowes. The PCs (Time Agents or I-Cops) must retrieve the dinosaur without drawing attention to themselves, which may mean avoiding the police, the real Ripper, and hundreds of splatter-loving time tourists.

This can also become a Victorian-era ***Horror*** adventure, with time-traveling NPCs, and PC investigators puzzling over the strange birdlike footprints around Liz Stride's mutilated corpse . . .

once-in-a-campaign technological innovation: the invention of the sling (or Diplomacy) might be just the edge the Good Guys need to win.

Migration

There are a number of reasons why a tribe might decide to migrate from its native territory to find a new home. They may have been driven out by another tribe or by a natural disaster such as an earthquake, flood or volcanic eruption. Or they might have exhausted the game in their region and starvation is forcing them to move on. The classic reason is the slow, relentless advance of the glaciers forcing them to flee south in search of warmer climes.

Whatever the reason, the migration setting gives the characters an excuse to travel extensively, over different terrains, through different climates. They will encounter numerous other tribes along the way. The ultimate goal is to find an uninhabited region rich in plants and wildlife, with adequate shelter, water supply, etc.

The best thing about this campaign type is that it incorporates all of the above themes, each involving perhaps three or four play sessions. By the time the tribe finds a new home, the PCs will be chieftains, shamans and heroes of legendary proportions, and ready either for retirement or adventures on their own, without the tribe.

The Quest

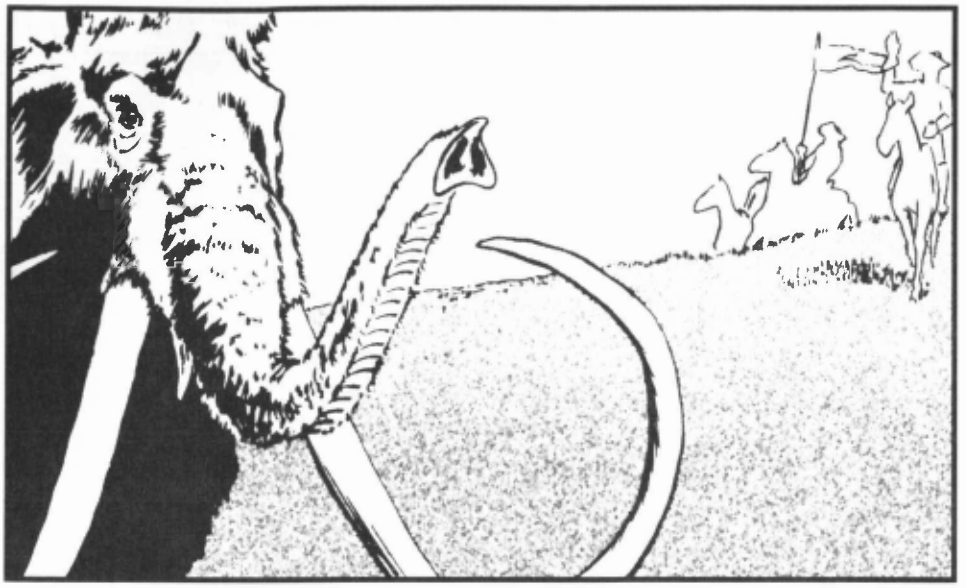
The movie *Quest for Fire* illustrates what this campaign is about. The characters are searching for something vital to the tribe's survival. Fire is an obvious choice, but it might be something of religious or magical importance. It could even be a person or persons. The PCs might be searching for their tribe – when they returned from an extended hunting trip the whole clan was missing. Or they might be seeking a new medicine man, shaman or leader.

The key to a quest campaign is to keep the players from losing interest in the object of the quest. Time pressure can increase the drama – perhaps a plague is slowly killing the clan. It should take them several sessions to locate what they're looking for . . . and when the party has almost achieved its goal, have it slip from their grasp once again. Or, when they've succeeded, have it stolen before they can get it back to the tribe. After two or three setbacks like this, the searchers should finally win out, and feel like they have really accomplished something.

Outlaws

This campaign revolves around a small group of characters who were cast out of their tribe or tribes for some horrible offense(s). It has several advantages. First, it gives a sound rationale for having characters from more than one tribe or race. Second, they have the freedom to be true adventurers in the classic sense – they have no ties binding them to one spot or group. Third, the outcasts can be as poor as the GM wants – they'll have to rely entirely on themselves since they have no tribe to fall back on.

There are countless adventure possibilities for a group of outcasts. They can become bandits and prey upon the neighboring tribes. They might have been unfairly exiled and go on a quest to vindicate themselves. Or they might set out into the unknown in hopes of founding a new tribe far away. They can even set



out to discover whether any of the tribe's old legends and taboos are real – they've already broken at least one taboo, why hesitate at venturing into the forbidden forest or cave? The outlaw campaign most resembles the classic fantasy campaign in style, and many of the same plots will work.

THE FRACTURED HISTORY SETTING

This campaign combines all the best elements of various periods in Earth's history into one setting. Although not strictly accurate, it is close enough to "feel" accurate.

In a fractured history setting the geologic timeline is compressed, so that one might find Australopithecine, Neandertal and Cro-Magnon tribes all living in close proximity with one another. The tribes will have wildly varying levels of technology, even within a single species, and will hunt and be hunted by creatures long extinct by Neandertal times. Any of the campaign themes mentioned above will work fine, and the GM will have more to work with.

Alien Visitors

In this campaign, Stonehenge is actually a complex observatory, there are spaceship landing strips in the Peruvian desert, and men from outer space first taught man how to make fire. Perhaps humans are actually the descendants of a lost colony that slipped back into barbarism, and the PCs are the last defenders of a high-tech refuge against their half-wild cousins. Maybe the aliens are on Earth to ensure that humans evolve into a highly advanced civilization, or to see that they don't. It's possible that there are two groups battling for the right to determine the destiny of *Homo sapiens*.

CAVEMAN SLAPSTICK

For people who loved Ringo Starr in *Caveman,* cracked up at the first ten minutes of *History of the World – Part I,* never miss the annual rerun of the *B.C. Thanksgiving Special,* and avidly collect *Far Side* prehistory cartoons, caveman

RECENT AND FUTURE ADVENTURES

Dr. X Will Build a Creature

In comics and B-movies, scientists (mad, sane or somewhere in between) frequently revive or recreate dinosaurs or other prehistoric creatures – which promptly escape into the nearest city. Unfortunately, the usual response will be to call for the military, and anti-tank weapons will make short work of most dinosaurs. However, a man-sized but deadly (and cunning) dinosaur might be able to elude the army by hiding in the park, the sewers or the subway system, providing a problem for supers, cops or a special ops team.

In a ***Cyberpunk*** or ***Espionage*** campaign, the PCs might be hired to break into the lab to steal a cell sample, and unexpectedly find themselves face-to-face with full-grown *Utahraptors*. Or, for a ***Supers*** adventure, a villain might be kidnapping politicians and transplanting their brains into cloned dinosaur bodies to make a point. One senator decides he *likes* being a *Megalosaurus*, and goes on a rampage – but killing him is still assassination. And in a ***Callahan's Crosstime Saloon*** campaign, an intelligent *Troodon* in a lab coat and mirrorshades might walk into the bar and offer to tell the true story of how the dinosaurs became extinct . . .

The Mighty Thaw

A herd of frozen mammoths, sabertooths, and other Pleistocene creatures with no fear of man are revived when lightning strikes the glacier in which they've been preserved for millenia. They wander into Anchorage, and are met by tourists, zoologists, film crews, trophy hunters, creationists determined to prove they're fakes, and an IST team trying to keep the peace.

Mammoths re-appearing in Montana could provide interesting problems in an ***Old West*** campaign, especially if they wander onto the Little Big Horn in 1876. ("I tell you, Colonel Custer, there's thousands of Sioux down there – and a whole bunch of hairy black elephants, too!")

Continued on next page . . .

RECENT AND FUTURE ADVENTURES (CONTINUED)

The World Well Lost

The PCs accidentally wander into Xijale, a "lost world" inside an enormous extinct volcanic crater, where dinosaurs still survive alongside a mostly TL2 human society. Xijale's secret is the water in a volcanic pool, which bestows immortality on those who drink it (what happens to those who stop drinking it is up to the GM; it should be at least as bad as going "cold turkey" from an addictive drug). As a result, Xijalese society has remained static for millenia. Their birth rate is kept to a bare minimum by the spermicidal effects of the water. Their soldiers, a small but elite force, have well-trained ceratopsian mounts and centuries of experience in dealing with troublemakers. PCs may find diplomacy and linguistics more useful than combat skills.

Creation Seance

While investigating a series of horrible deaths, a team of superheroes receives a call for help from a woman who claims to have been pursued by an *Allosaurus* in a car-park late at night. The PCs track down the dinosaur, which then mysteriously disappears. A series of late-night dinosaur sightings and attacks occur before the PCs find a common element – an adolescent boy who has the power to bring back the past while he dreams. Killing him would be unethical, but how else do they stop the dreams?

slapstick may be just the thing. Here players and GMs can be as ridiculous as they please. Use bad puns. Use sight gags. Be utterly silly. The whole point of this type of campaign is to have fun.

Creatures

The world of caveman slapstick is populated with three kinds of animals: dinosaurs, giant insects and domestic creatures. Dinosaurs are there primarily to chase the characters. They should be extraordinarily slow, giving players plenty of time to ham it up and think of truly stupid ways to distract the monster. A common trick is to make the most horrifying of the monsters really a sweet-tempered guy, just trying to make a few friends and maybe strike up a conversation, when everybody starts screaming and running about. Giant bugs, on the other hand, are very rarely friendly. They can range from mosquitoes the size of basketballs to spiders the size of trucks. They are unbelievably gooey creatures to kill. Green or yellow ichor spurts from every wound, and the foul-smelling stuff will usually strike someone in the face. The attacker or the person being rescued are the most likely candidates.

Technology

There are two methods of dealing with technology in a slapstick campaign. The first is to start out with absolutely nothing but clubs and an occasional "Ugh!" During the course of play, however, the characters will discover fire, language, music, the bow and arrow, how to domesticate animals, the wheel, the Swiss Army rock, and who knows what else. This is one genre where such things should happen on a regular basis.

The other method is to have thoroughly modern technology, with a stone age twist. This is where domestic animals come in. A jumbo jet might actually be a huge *Pteranodon* and a bus a brontosaurus. A radio is a hollow box with a talking bird inside, and a vacuum cleaner is actually a tame, pint-sized woolly mammoth.

These creatures are essentially slave labor. They can often talk, but usually don't let humans hear them. When they do, it's to complain, harass or otherwise annoy the characters. The *Flintstones* cartoons are the ultimate source for items of this nature.

Slapstick Adventures

This genre is not really suited for an extended campaign, unless the GM and the players have incredible capacities for enduring and thinking up bad jokes and puns.

There are two basic styles of adventures. In a "realistic" adventure, the characters begin with simple stone-age technology, and are out to achieve some goal, such as getting the food or beautiful women away from the tribe of Big Brutes. Along the way they will have all kinds of escapades, discovering anything from walking upright to fire to comedy. Eventually they will succeed in achieving their desires, but may find that they were happier as the underdogs after all.

The "unrealistic" adventure has kooky cartoon technology and plots straight out of the syndicated sitcoms. In fact, those sitcoms are an excellent source for plots. The *Flintstones* occasionally satirized detective TV shows, James Bond movies, the CIA (Cretaceous Igneous Agency), and Atomic Horror B-movies: GMs running a slapstick campaign are encouraged to do the same.

GLOSSARY

amniotes: Vertebrates that lay hard-shelled eggs (includes reptiles and synapsids).

anapsids: A group of reptiles with no skull openings behind the eye socket. Includes turtles and tortoises.

archosaurs: "Ruling reptiles." A group of reptiles including dinosaurs, pterosaurs, thecodonts, crocodiles and (according to many) birds.

arthropods: "Jointed legs." Animals with jointed exoskeletons, such as insects, spiders, crabs, trilobites, etc.

binomial nomenclature: Popularly called "scientific names." The system of naming organisms by genus (capitalized, e.g., *Tyrannosaurus*), and species (lower case, e.g., *rex*). These names should always appear in italics.

biped: An animal that normally walks on two legs.

Burgess Shale: Fossil-bearing rock in Canada, containing many specimens of early Cambrian marine life.

Cambrian Explosion: "Sudden" appearance of a wide variety of life-forms during the Cambrian era.

carnivore: anything that lives by eating meat.

ceros-, cera-: "horn," as in rhinoceros, "nose-horn," *Triceratops*, "three-horn-face."

chordates: Animals with nerve cords. Includes all vertebrates, those animals with spinal columns and skulls.

coelacanth: A lobe-finned fish of a type thought to be extinct for 70 million years, until rediscovered in 1938.

coprolites: Fossilized animal droppings.

deino-, dino-: (prefix) "fearfully great," as in dinosaur, "fearfully great lizard," *or* "terrible," as in *Deinonychus*, "terrible claw," etc.

diapsid: A group of reptiles with openings behind each eye socket. Includes dinosaurs, crocodiles, lizards and snakes.

dinosaur: "terrible lizard." A member of the superorder Dinosauria, a land-living reptile with an erect (mammal-like) gait.

ectothermic: "heated from outside"; cold-blooded.

Ediacaran fauna: Fossils of pre-Cambrian life-forms, named after Ediacara, Australia.

endothermic: "heated from within;" warm-blooded.

gastroliths: "stomach stones," rocks kept in the gut, used by birds and some species of dinosaur for chewing food in the stomach.

genus: (plural, genera) A grouping of similar organisms; a genus contains one or more species. Genera are grouped into families.

Gondwana: One of the supercontinents of the Mesozoic, comprising what are now South America, Africa, India, Antarctica and Australia.

homeothermic: "maintaining a constant heat"; warm-blooded.

K-T boundary: the layer marking the end of the Mesozoic era and the beginning of the Tertiary, approximately 65 mya.

herbivore: an animal which eats plants.

Laurasia: The other supercontinent of the early Mesozoic, comprising what are now North America, Europe and Asia.

-lith: "stone," as in paleolithic, "of old stone," gastrolith, "stomach stone," lithograph "written on stone."

Mesozoic: "Middle life," the time of the dinosaurs. The era comprising the Triassic, Jurassic and Cretaceous periods.

Neolithic: "new stone." The "new stone age" comprises the time from the invention of agriculture to the invention of metal tools and weapons (in ***GURPS*** terms, the entry to Tech Level 1). See "Paleolithic."

-odon: "tooth." As in *Troodon*, "wounding tooth."

Paleolithic: "old stone." The "old stone age" comprises the time from man becoming a tool-maker to the invention of agriculture. See *Neolithic*.

paleontologist: A person who studies fossils.

Pangaea: "all earth." The supercontinent that existed before the Mesozoic, when it broke up into Gondwana and Laurasia.

poikilothermic: "variously heated"; dependent on external heat sources, cold-blooded.

quadruped: An animal that normally walks on four feet.

raptor: "robber," as in *Velociraptor*, "speedy thief." Scientifically, the *raptors* are the birds of prey.

-saur, -saura, -saurus: "lizard."

scutes: "shield," bony or horny plates embedded in the skin.

species: A group of organisms capable of interbreeding in the wild and producing viable offspring. Similar species make up a genus.

synapsid: "fused skull." A "mammal-like reptile."

theropods: A large group of bipedal dinosaurs, including all known carnivorous dinosaurs.

-tops: "face," as in *Triceratops*, three-horn-face.

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Magazines

The Dinosaur Report is published quarterly by the Dinosaur Society, and contains the latest information on dinosaur discoveries.

Good articles on dinosaurs and other prehistoric life can often be found in *Earth, Discover, Science News, Scientific American* and *New Scientist.*

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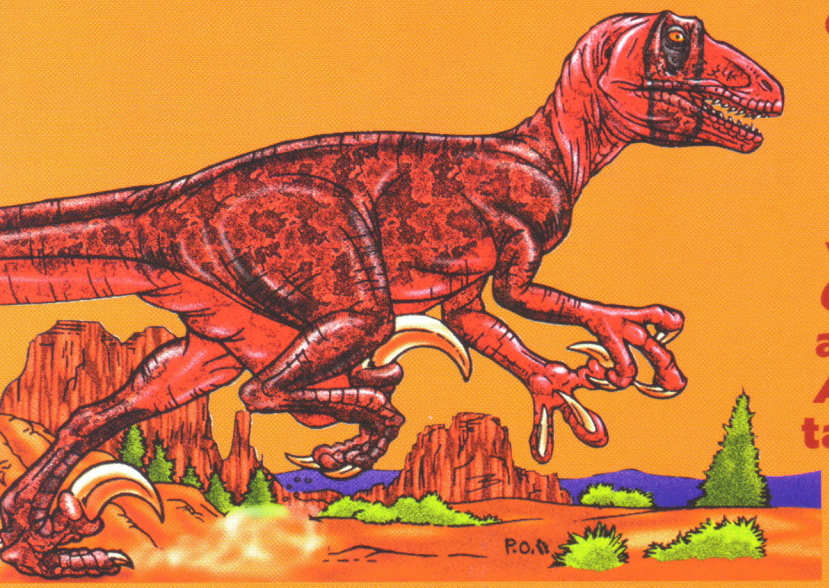
TYRANT KINGS!



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