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# BEER'N'BONES

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FLINDERS UNIVERSITY PALAEOLOGY SOCIETY

## "Message from the President....."

With Christmas and New Year now behind us and results celebrated or mourned, we can now set our sights on 1998 and all it holds. For the Palaeontology Society there are several activities already fast approaching.

The next lot of Palaeo groupies are about to metamorphosize with the V.P.I Naracoorte field trip commencing on Feb 8th. Many members of the Palaeo Society will be on hand to watch the next batch embark on this new experience. hear them moan about the workload (like we did), try to fit a lot of socialising in at the same time (like we did) and find themselves behind with lots to do at the last minute (like we did), but get through, make many new friends and generally feel pleased they went (like we did). Good luck 1998 V.P.I's.

O-week is also fast approaching & I hope that you will all get involved on Fair Day, manning (sorry, personning) the display, and selling raffle tickets. A bottle of Jim Beam is again being raffled at 20 cents a ticket or 6 for \$1.00. Sell them to your friends and rellies. Hopefully we will pick up some new membership.

To everyone, wishing you all an excellent and productive 1998. Good luck with your year.

*Lyndlee Turner -President*



## **Cuddie Springs Archaeological Dig - Sem. 2 Mid-semester Break, 1998.**

*By Dave Bart*

A quick note to all interested students : the Cuddie Springs Archaeological Dig is scheduled for September to October of this year. A group of 5 of us went last year, and were rewarded with field experience, the chance to use computerised data logging equipment, and with evenings talking to, arguing with, and getting to know some really knowledgable Australian archaeologists. If you are interested in going to the dig, let it be known to others, especially Chris Langeluddecke or myself, ASAP, as the sooner we know who wants to go, the sooner we can let the Uni of Sydney crew know, and the better our chances of being able to go there in the Sem. 2 mid-semester break.

## **THE BACK TO THE 70'S NIGHT**

A tentative booking of the Kelly Morris room has been made for Friday night of either March 13th or 20th.

A fine will incur if you do not come in 70's gear. A barbecue tea will be included in the price. The drink situation will be advised closer to the night.

Come along and enjoy infinite hours of fine 70's music.

## **Other planned activities**

-Inthira is organising working bees to sort and prepare the Kangaroo Island material. Please let her know if you are interested.

-a Casino all-you-can-eat lunch is being organised. We'll keep you posted on this one

-Palaeo Society T- shirts can now be ordered. Please put your order to Lyndlee Turner with a \$5 deposit. **We cannot lodge the order until we have 20 sales so the sooner you get your order in the sooner you get your T-shirt.** For any queries about designs or colour, speak to Fernando Farrugia (he's our resident clever artist).

**Vertebrate Palaeontologist  
student conference -  
Naracoorte 1998, 15th to 18th  
of April.**

Arrangements are well under way for this once-planned-as-a few-papers-and-a-lot-of-socialising meeting of Australia-wide palaeontology students, but now a much enlarged, quite conference-like real conference. Liz has even been able to invite the interest of **Dick Tedford** who will be the guest speaker. Presentations will also be made by Rod Wells and about 40 other people of palaeontological importance and related fields, from around Australia.

The Palaeontology Society are involved as support staff as well as many members giving seminars.

Officially, a \$100 package is being offered for students, which includes registration, meals and camping site fees (people are expected to BYO tents etc). As well as the presentation of papers, caving trips will also be available at reduced fees.

For more information see Liz Reed or Matt McDowell in Biol B3 (the Palaeo lab). These were the people foolish enough to say, "Yeh, we'll organise the next Australian student conference!" I wonder if they'll ever do it again?

**The Inaugural Palaeontology  
Society Vs. Archaeology  
Society Cricket (well almost)  
Match**

by **Steve Brown**

A warm sunny Sunday afternoon with a gentle breeze and plenty of eager professional backyard cricketers provided the setting for the inaugural Palaeontology Society Vs Archaeology Society cricket match. The day started off with a couple of beverages

and an enthusiastic Palaeo team taking to the field lead by the experienced captaincy of Gav.

The Archaeo team started pretty slowly but soon picked up their pace with some memorable hitting particularly by Garth (ring-in). His illustrious six onto Sturt Road was a highlight although the game was held up for quite a time.

Memorable bowling performances were provided by Inthira, Briony and Fernando with all striking fear into the opponents. After the last batsperson fell leaving the score at around 111 (I can't really remember), more drinks and a BBQ were enjoyed by both teams and on viewers.

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After successfully trying to get us a bit uncoordinated, the Archaeo team took to the field to defend their **dismal** reasonable total. Rob (ring-in) and myself opened the batting while Garth (ring-in) bowled his heart out with little luck for the Archaeo team. At least one true Archaeo member, Phil, bowled with some luck and authority(?).

Although we had a good start to the run chase, wickets fell quickly and about 20 runs were needed when Inthira joined Gav at the crease. Not only did the pair get the required runs, but played some memorable strokes that would put the most avid backyarder to shame.

### Unstoppable Dave the Carnagemonger

In Conjunction with Sir David Attenborough and the Godfather

presents

a **Skirmish War Games** production

Directed by my faithful band of mongoose assassins

# Field of Bones

## THE ULTIMATE ENCOUNTER

**What:** A full day of insane paintflinging in the great outdoors.  
A chance to peg your buddies in the butt  
with a screaming ball of vegetable dye.

**Why:** Does anything I do make sense in the big picture?

**Where:** Skirmish War Games paintfield, Deep Creek Conservation Park, 1h from Adelaide (maps supplied)

**When:** Planned date: Sunday 22nd March, 1998, meeting at 9 am at Darlington Macdonald's, South Rd. Date subject to change until 22 Feb.

**Who:** Anyone with a nose for fun. Invite your friends, relatives, pets, spiritual advisers - the more the merrier (however, management reserves the right to refuse entry to moose, elk, eland and any other large herbivore, as deemed appropriate).

**Cost:** \$35-50 depending on how crazy you go with paint. Price includes weapons, protective and camouflage gear, a hearty lunch and caffeine rich drinks.

**What to bring:** Strong shoes, sunblock, hat. The use of gloves, groinguards and performance enhancing drugs is encouraged.

**Contact:** Sockbox on W: 82012630, H: 83582324, E: bart0110@finders.edu.au for details. Further details will be distributed after 22 February.

Although the Archaeo team was gracious in defeat, we still haven't got the "Digger's Shield" yet. I guess they want to hold it one last time coz they'll never see this prize again. The challenge match for the "Digger's Shield" will hopefully be a regular each year or even biannually. A few more participants will be welcomed next match as a good time is assured.

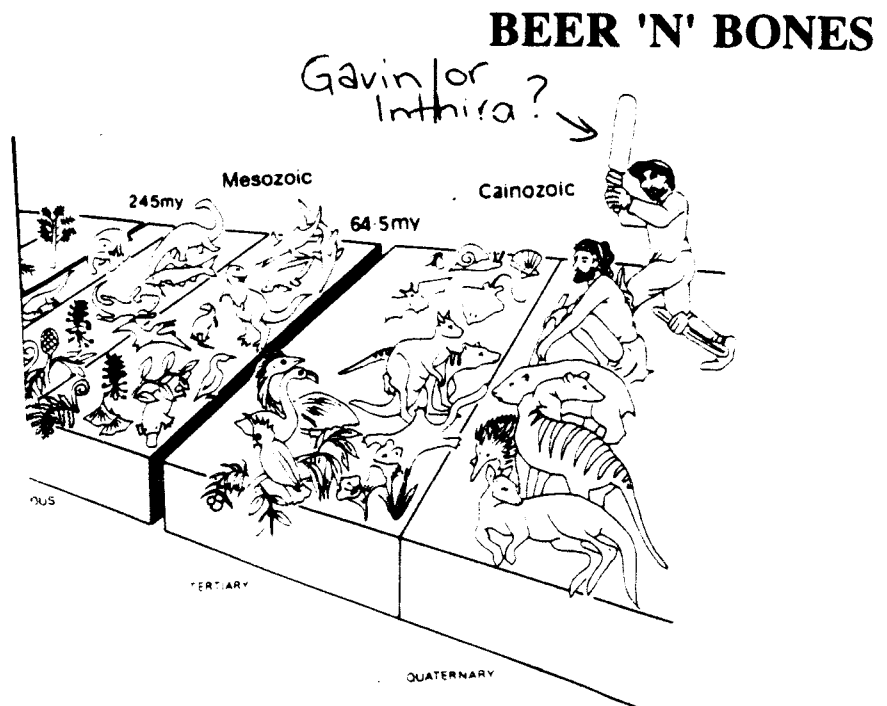
### PLIOCENE MARSUPIALS FROM LAKE KANUNKA

by Gavin Prideaux

(The recount of the Kanunka 1997 trip continue.....s)

#### **The Kanunka Fauna: Diversity, Palaeoecology & Evolution**

.....In terms of species richness, the Kanunka Fauna is unrivalled in the Pliocene of Australia. Close to 60 species are present, which is approximately 50% greater diversity than the next most speciose Pliocene assemblage, the Chinchilla Fauna of southeastern Queensland. (40 species). A large component of this diversity is provided by the vast range of macropodids in the deposit - at least 23 species.. They contribute more than a third to the total number of species in the Kanunka Fauna, and markedly outweigh the 11 species from Chinchilla, and 15 species from sites at Bow in NSW and Hamilton in Victoria. In fact, such diversity is only equalled or surpassed by the continent's richest vertebrate assemblages, the Miocene Riversleigh Fauna (at least 32 species) and the Pleistocene cave deposits of Victoria Fossil Cave, Naracoorte (23 species) and Wellington Caves, NSW (35 species). The macropodid diversity is even more startling



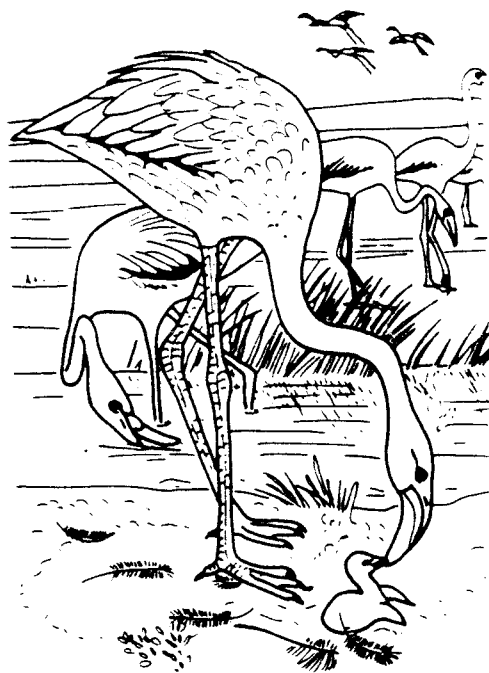
when we consider that the Wellington Caves and Riversleigh almost certainly accumulated fauna over much longer periods of time. Differences in species diversity of non-macropodid groups between the major Australian Pliocene assemblages are minimal. Possums are rare to absent in most deposits except Hamilton, where there are at least 9 species. The proportion of diprotodontoids, thylacoleonids, vombatids, dasyurids and bandicoots in the Kanunka Fauna is not significantly different from any other Pliocene site. Bird faunas of any note are only documented for Kanunka, Bluff Downs and Chinchilla, and the majority of these are species directly associated with water habits, eg., ducks, darters, cormorants, ibises and flamingoes.

A diverse array of aquatic vertebrates and water birds indicates a fairly permanent fluvial (stream, river) and lacustrine (swamp, lake) system in the Kanunka area at the time of fossil accumulation. The

presence of several macropodid taxa, such as *Dendrolagus* (tree kangaroo), *Thylogale* (pademelons), *Kurrabi* and *Wallabia*, along with 2 pseudocheirid species (ringtail possums) strongly suggests areas of wet sclerophyll. Perhaps this points to relatively wetter conditions around Lake Kanunka 3.4 million years ago than that proposed for the Palankarinna fauna, a 3.9 million year old channel fill assemblage from stratigraphically lower in the Tirari Formation at nearby Lake Palankarinna (Tedford et al. 1992). However, the Kanunka Fauna contains species of *Macropus*, *Prionotemnus*, *Protemnodon*, *Sthenurus*, *Troposodon*, *Phascolonus* and *Diprotodon*, which clearly seemed adapted to drier, more open habitats, like grasslands and woodlands. Therefore, a transitional mosaic of different

habitats is likely for the region, a mix which encapsulates one of the last central Australian bastions of taxa adapted to a wetter, more forested (Miocene type) environment and those adapting to the increasingly arid, seasonal conditions of the late Cainozoic. Almost certainly, available habitats for the taxa adapted to wetter conditions were fragmenting and contracting through the Pliocene, and by the Pleistocene must have all but vanished. Unfortunately, no Pliocene floras are known from the Lake Eyre Basin (Truswell & Harris 1982), which places added importance on inferences made from the Kanunka Fauna. Aside from the habitat heterogeneity implied by the array of vertebrate, the Kanunka Fauna is an unusual association in terms of the different stages of evolution that the marsupials display. The most informative group from an evolutionary perspective are the macropodids. Those genera apparently adapted to more mesic or forested habitats (*Dendrolagus*, *Thylagale*, *Kurrabi*, *Wallabia*, *Dorcopsoides*, *?Ekaltadeta*) also tend to be more primitive and frequently occur earlier in the Miocene or early Pliocene. This may suggest that these taxa are relictual and those adapted to open woodland or grassland are more recent colonisers, eg., *Sthenurus*, *Troposodon*, *Protemnodon*, *Lagorchestes*, *Macropus*. The presence of *Hadronomas* is not only interesting because it has only been known previously from the late Miocene of Alcoota, but also because it is the first large macropodid to appear in the fossil record and the first to show any adaptation to feeding on tougher vegetation.

This faunal mixture can be interpreted as one indicative of a Palaeoenvironment in transition. Toward the end of the Miocene, Australia's climate



developed increasing seasonality, and the continent became divided into palaeogeographic regions (Frakes et al. 1987). Most important was the aridification of central Australia and the steady disappearance of large, permanent bodies of water. The faunas and sediments of the late Oligocene (26 to 24 million years) Etadunna Formation suggest the Lake Kanunka area was formerly covered with chains of permanent lakes and ephemeral waterholes, intercepted by rivers and streams inhabited by many different aquatic vertebrates. In the lower part of the Etadunna Formation abundant pollen from typical rainforest plants, like the southern beech, suggest lush forests (Truswell & Harris 1982), an inference supported by the presence of a vast array of arboreal taxa (eg., possums, koalas). Unfortunately, there is a massive 20 million year gap in the Lake Eyre Basin fossil

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record until the early medial Pliocene. Only the late Miocene Alcoota and Ongeva Faunas of the Waite Formation fill this temporal break in central Australia. Here, strong seasonality already appears to have taken hold, with both geological and faunal evidence pointing to a sparsely vegetated proximal palaeoenvironment surrounded by savannah and low scrub (Murray & Megirian 1992).

According to both geological and faunal evidence, conditions appear to have been even drier by the time the Palankarinna Fauna accumulated around 3.9 million years ago (Tedford et al. 1992). While retaining the common fish, chelid turtle and crocodile remains, the Palankarinna channel deposit also contains very large diprotodontids, the large browsing kangaroos *Protemnodon* and *Sthenurus*, and is dominated by the grazing kangaroo *prionotemnus palankarinnicus*. Grazing macropodids, ubiquitous today, were unknown prior to this time and their abundance would seem to herald the spread of grassland. In fact, the only small mammal known from the fauna is *Ischnodon australis*, a bilby whose Pleistocene and modern relatives represent inhabitants of relatively arid grasslands. In light of the trend toward a more arid climate in central Australia and the subsequent adaptation of marsupials to these conditions at Alcoota and Lake Palankarinna, the Kanunka Fauna is remarkable because it represents a mix of generally primitive mesic adapted forms and derived xeric adapted forms. From this, it seems logical to conclude that high species diversity, particularly among macropodids, must have been maintained because permanent lakes and streams did not disappear from the immediate area. By the same token, open

woodland and grassland must have been present and was probably expanding, as most of the taxa that come to dominate the Pleistocene fit within this guild. In all probability, mosaic and transitional habitats in the Kanunka area may have provided an important centre of evolution for macropodids adapting to drier conditions of the late Cainozoic. It confirms previous ideas, based on eastern Australian deposits, that the medial Pliocene was a crucial period in terms of macropodid diversification, with many of the Quaternary genera established at this time.

### Conclusions

Like the vast majority of palaeozoological deposits, the Kanunka site is very difficult to work, the yield of fossils is low and the remains are fragmentary. However, despite the limited research undertaken, the potential is high for improving our knowledge of the Kanunka Fauna and the Pliocene in general. In reality, we have only scratched the surface and there are many avenues of study available, including faunal systematics and evolution, and palaeo-environmental reconstruction.

In the past 25 million years, environmental change in central Australia has been more extreme than in any other region on the continent, shifting from rainforest in the Oligo- Miocene through to desert today. However, despite large breaks in the fossil records and the paucity of known fossils sites, deposits like Kanunka and Palankarina channels provide evidence which indicates that the transition was complex and varied. Evolutionary biologists have frequently recognised such transitional environments and habitat mosaics as major centres of evolutionary change. The Pliocene channel deposit at Stirton Quarry, Lake Kanunka

appears to capture a particularly important time in terms of the evolution of Australian marsupials. Furthermore, nothing comes close to the experience of digging up bones on the side of a hill and sitting around the campfire in the middle of the desert, where the silence is almost deafening and any form of civilisation is a very very very long way away.

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### AND FROM THE PRESS

*The December 1997 National Geographic included an article entitled "Uncovering Patagonia's Lost World", written by James Shreeve.*

".....Rolling across the vast, dry plains of southern Argentina, palaeontologist Rodolfo Coria hunts a long-dead quarry - fantastic dinosaurs buried in

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South America a hundred million years ago that are now coming to light in an explosion of discoveries...."

Corai finds include a juvenile *Gasparinisaura* skull. The find suggests that 70 million years ago such 2 legged, herbivorous dinosaurs survived in South America after close relatives died out elsewhere.

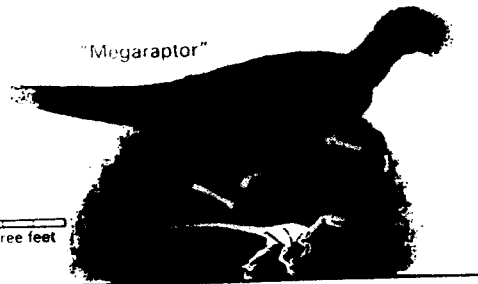
Photographs on the following pages include the 42-foot long Cretaceous beast, *Giganotosaurus*, one of the largest of all carnivores, dwarfing a herd of human sized herbivores, larger cousins of *Gasparinisaura*. Based partly on *Giganotosaurus*'s remains, found near El Chocon, palaeontologists propose a later than supposed link between the continents of South America and Africa, where a related beast lived 25 million years before North America's *Tyrannosaurus rex*. *Giganotosaurus*'s dagger-like teeth suggest that the creature preyed on herbivores many times its weight. Unlike the longer, wider, bone crushing teeth of *T. rex* the teeth of *Giganotosaurus* were best suited to cutting flesh. Canadian palaeontologist Phillip Currie suggested that "This animal would run in, take a very large bite, then back off and watch. Basically the prey would bleed to death."

Also pictured is Megaraptor (silhouetted behind *Velociraptor*). A foot claw of this beast is the largest yet discovered. Palaeontologist Fernando Novas quotes "Nobody suspected the existence of such an animal. I can't reject the possibility it is a new lineage." It was collected in January 1996 from 90 million year old mudstone near Plaza Huinul.

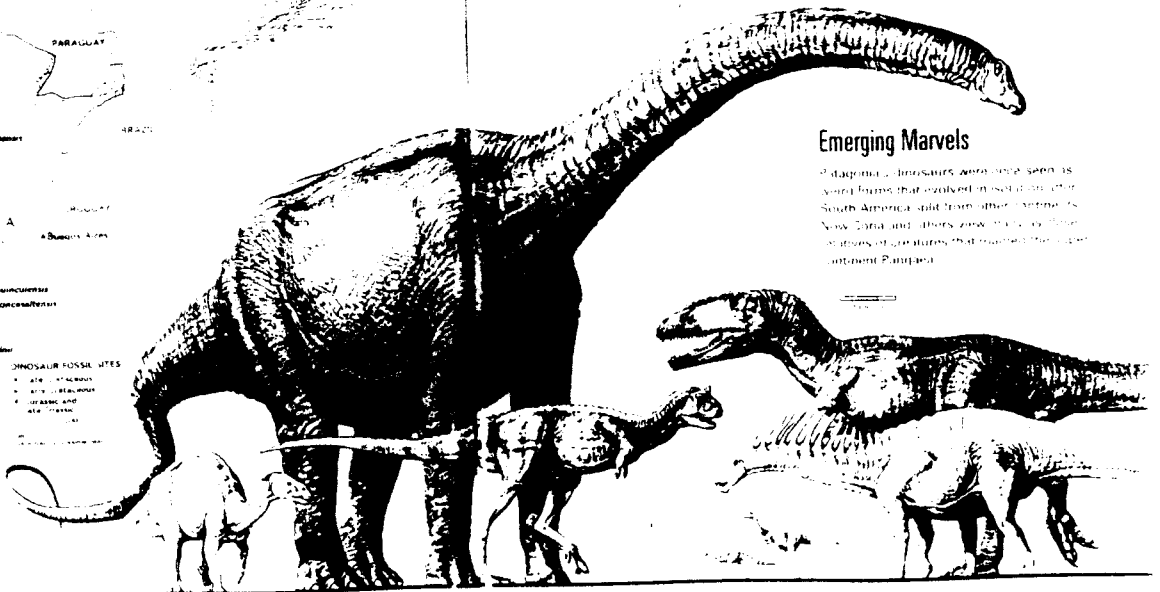
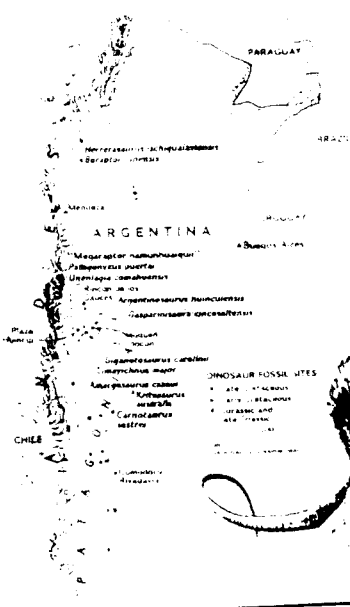
The area whose residence call it the "Valley of the Dinosaurs" also boasts 3-toed

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fossil tracks near El Chocon marking the path of *Limavichnuid major* which lived when shifting continents transformed global environments.



Velociraptor



Emerging Marvels

Patagonian dinosaurs were once seen as young forms that evolved in isolation. Other South America split from other continents. Now data and others now trace the migration of dinosaurs that reached the continent Patagonia.

**AND JUST FOR INTEREST**

This article appeared in *National Geographic's* January 1998 edition.

**Australian Lizards: True Blue, Mate**

Most lizards go through the same old motions of lizard life: Mate, leave your mate, have your young, ignore your young. Not so Australian sleepy lizards, which lead more complex lives and practice monogamy more faithfully than any other lizards, says C. Michael Bull of Flinders University in Adelaide.

More than 80 percent of sleepy lizards stay with their mates for two breeding seasons, and some relationships last ten years or more. And though no other lizards recognize their young after birth, female sleepy lizards can discriminate between their offspring and those of other sleepy lizards. The species may live as long as 30 years—perhaps the reason they have no problem with commitment.

TEXT BY JOHN E. J. TOY

**A *Diprotodon* Graveyard,  
Lake Callabonna**

**NEXT ISSUE OUT SOON!!!!**

*Editor: Lyndlee Turner*

*Articles always appreciated.  
Phone 82966836*

**F.U. PALAEO SOCIETY**

**PRESIDENT ;Lyndlee Turner**

**VICE PRESIDENT ; Steve Brown**

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WALKING ON TWO FEET

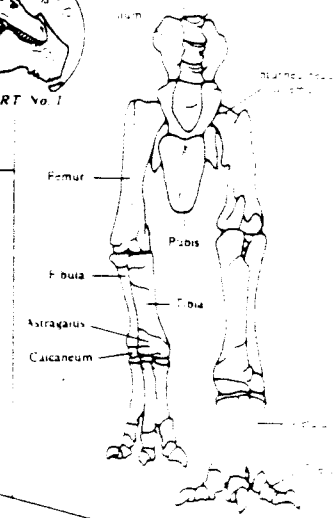
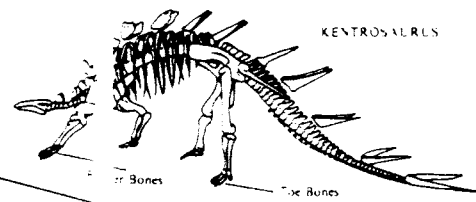
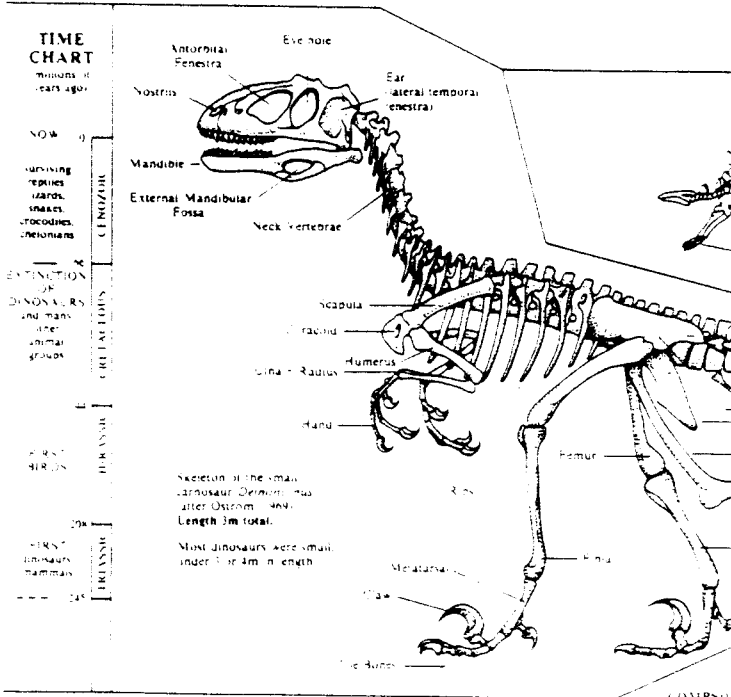
ITS ALL IN THE FEET

The special feature that distinguishes a dinosaur from other reptile groups is that they walk on their toe bones (digit), with the metatarsal bones conveying all the animals weight to the ground (also in the hands for bipedal dinosaurs)

— The skull is also specialized in having additional holes (foramina) in front of, and behind the eye holes.



Diagram of a dinosaur skull showing foramina.



BIRDS ARE DINOSAURS

The first bird, *Archaeopteryx*, has a skeleton anatomically similar to small, running dinosaurs like *Compsognathus*, and also walks on its toes. All living birds are descendants of dinosaurs.

