Humans And Fauna In Australia Essay, Research Paper

In 1830 Mr. Rankin tied a rope around a projection out of a rock face in order

to lower himself into Wellington Cave (Horton, 1980). The projection turned out

to be the bone of a giant extinct marsupial. It was to be the first discovery of

a great range of giant marsupials. Were these animals extinct?? Horton (1980),

describes how Leichhart believed that on his journeys to northern Australia he

would find Diprotodon still roaming over the land. We now know that he was

probably only about 20,000 years to late (Flood, 1995). In general, all the

animals greater than 40 kg in body weight became extinct at the end of the last

Ice Age. By the mid 19th century scientists had already begun to postulate about

the disappearance of these animals, and today it remains one of the most

controversial subjects presented to man, (Horton, 1980). Australia was not the

only country to experience extinctions of large animals, (Martin, 1984). At the

end of the last glacial period nearly every continent experienced extinctions of

large animals. Animals like the Mammoth, giant ground sloths, and mastodons were

roaming the Americas. Northern Eurasia featured woolly mammoths, giant deer,

hippopotamus and straight tusked elephants. Of all the continents, it could be

argued that Australia lost some of the most distinctly unique fauna in the

world. The popular opinion for the cause of extinction is the ‘blitzkrieg’

hypothesis, which is held by such researches as Paul Martin in his controversial

article "Prehistoric Overkill: The Global Model". This states that

humans are directly responsible for these extinctions world wide. The Problem

with this model for Australia is that humans may have arrived on this continent

well before the extinctions took place (Flood, 1995). On other continents the

extinctions coincided almost exactly with the arrival of man (Martin, 1984).

European man was not the first member of the genus Homo to set foot on the

Australian continent. There is evidence to suggest that Aboriginal people have

been walking on Australian soil for many tens of thousands of years (Flood,

1995). Whether or not Aboriginal people interacted with the large now extinct

beasts is hard to determine. Did an overlap in time exist between humans and

these large beasts? Is there any evidence that humans actively hunted them, and

if they did, is it possible that they drove them to extinction? Land of the

Giants During the late Pleistocene, the last glacial period spanning roughly

100,000 years, the faunas were completely different to those that are

represented today. The most pronounced difference is body size. The term ‘megafauna’,

meaning ‘large animals’ has been used to describe late Pleistocene animals

throughout the world. We know that most species of mammals greater than 60 kg in

bodyweight became extinct at the end of the Pleistocene. ‘Megafauna’ is not a

taxonomic group nor is there a standard definition. Generally, the term

megafauna describes an animal that weighs 40 kg or more, but in Australia that

would result in including four species of living kangaroos (the grey, red,

antilopine and wallaroo) and probably excluding the extinct carnivore Thylacoleo

and the smaller Sthenurus (short faced kangaroo) (Murray, 1991 in Vickers-Rich

et al., 1991). Horton, (1984) came up with a tedious but more precise definition

for the Australian megafauna: ‘Animals that became extinct before the Holocene

and are large, either in an absolute sense or relative to other members of some

taxonomic rank, or are part of a taxonomic category all of whose members became

extinct and some of whose members are large.’ Fifteen genera and roughly

forty-one species of mammalian megafauna became extinct in Australia at the end

of the Pleistocene (Flannery, 1990). It should be noted that this essay is not

going to consider the many large birds (e.g. Genyornis) and reptiles (e.g.

Megalania prisca) which also became extinct during the Late Pleistocene. If

these non-mammals are added to the tally of extinctions, the number of

megafaunal genera extinct goes up to nineteen (Flood, 1990). A typical mammalian

megafaunal community consisted of a variety of forms, such as: Zaglossus;

Marsupial Lion Thylacoleo; giant wombats Phascolonus; long-beaked echidnas; the

Marsupial Tapir (Palorchestidae); Diprotodon (Diprotodontidae); and some

especially large morphs of the living Macropus (Macropodidae), (Murray, 1991 in

Vickers-Rich et al., 1991). The most deserving of the term ‘megafauna’, was

Diprotodon, which probably looked like a wombat ‘gone wrong’. Weighing in at

2000 kg, Diprotodon was a browser which preferred the drier open expanses of the

interior of Australia. The majority of the megafauna was herbivorous, such as

the cow sized Zygomaturus trilobus, the stumpy giant wombat Phascolonus gigas,

and the large macropods Procoptodon, and Protemnodon. A trend seen in the

megafaunal assemblage, that still exists with the extant fauna today, is the

distinct lack of carnivores (Flood, 1990). The Pleistocene carnivores were

limited to just three species: Thylacoleo carnifex, known as the ‘Marsupial

lion’ or the ‘giant killer possum’; the carnivorous lizard Megalania; and the

Tasmanian ‘tiger’, Thylacines. Thus, the large herbivores of Australia did not

co-evolve with a fleet of carnivores, like hyenas and canids and felids of

Africa. Flannery, (1994) believes it is the lack of carnivores that led to

faunas dominated by lumbering beasts that weren’t fast long distance runners

like those found in Africa. Flannery also suggested that being slow and naive to

predators, was a factor that led to their demise. One of the most frustrating

aspects of palaeontology is trying to place a fossil bearing rock into the

geological record. It wasn’t until 1945 when radiocarbon dating was first

applied in Australia, that the pieces of the megafaunal puzzle started to fit

together (Horton, 1980). Since then, dating techniques have improved. However,

there are still problems with dating bone so palaeontologists have had to rely

on stratigraphic association using more reliable, datable materials such as

charcoal and shell (Flood, 1990). Bone samples lose their collagen with time,

and are also susceptible to contamination, especially by younger calcium

carbonate carried down by groundwater. It is for these reasons that the exact

timing of the extinction of the megafauna is controversial. There are many Late

Pleistocene fossil sites found within Australia (Fig Martin last of the aus

meg). Of these sites, there a few that have narrowed down the timing of the

extinction event to somewhere around 20,000 years ago. (Fig Flood page 183).

These sites, in general, are all open sites situated in south-eastern Australia

(Flannery, 1990). Gilespie et al. (1978) describes a bone bed that contains up

to ‘10,000 giant marsupials’ at Lancefield Swamp in Victoria. The megafauna has

been dated fairly reliably, from charcoal in sediments directly below the fossil

bed, at 25,000 ? 800 BP and 26,000 ? 650 (Fig flood). There are other, less

reliable date, which may nevertheless support late existing Pleistocene

megafauna. Amongst these: Spring Creek, first dated on plant matter at 19,000 ?

390 BP (Flannery and Gott 1985), later revised to 35,000 BP (Flood, 1994);

Beginners Luck Cave, dated from bone collagen dates at 10,100 ? 200 BP, and

1,450 ? 210 BP (Murray and Goede, 1977, in Flannery 1990); and finally Lime

Springs, NSW bone fragments have been dated at around 19,000 to 6000 BP

(Flannery, 1990). If we take these dates as correct then we could have had

megafauna roaming around Australia as early as 6,000 BP or even 1,450 BP.

Unfortunately these are thought of as suspect. The bone from Beginners Luck Cave

has been interpreted as being an example contamination, and the bone from Lime

Springs is thought of by some as being reworked. The good news is that after all

the controversy surrounding dates of various sites, Cuddie Springs in semi-arid

New South Wales has provided sound information about the timing of extinction.

Cuddie Springs provides a secure stratigraphic succession which contains

abundant bones (Fig. Cuddie springs). A series of dates have been done on

charcoal that range from 30,280 ? 450 BP for the base of the succession to

19,270 ? 320 BP for the top. This means that Megafauna definitely existed in

Australia until 20,000 years ago. Unwanted Guests Much of the field of human

palaeontology is of little relevance to understanding the history of Australia

evolution (Flannery, 1994). This is because much of the evolution of man

occurred on other continents such as Africa and Asia. Until this year, it was

known from archaeological evidence in the Northern Territory that Aboriginal

people first arrived in Australia at least 60,000 years before present (Flood,

1994). Recent evidence suggests that we may have to re-write the text books when

it comes to human evolution. In mid-September of this year scientists discovered

in the Kimberly region of Western Australia, several enormous sculptured

boulders that had detailed circular engravings on them, (Woodford, 1996). This

rock art, which has been dated at up to 75,000 years old, may be the oldest rock

art in the world – more than twice the age of the French rock paintings at

Chauvet and Cosquer. While excavating the sediments below the art, ochre was

found dating up to 116,000 years, (Fig Sydney Morning Herald). Artefacts (stone

tools) were also found in a layer of sediment between 116,000 and 176,000 years

old. During the Pleistocene there were two major drops in sea level due to huge

amounts of water frozen in ice sheets. These glacial maximums occurred around

18,000 years ago, and 140,00 years ago (Flannery, 1994). This drop in sea level

resulted in much of the Australian continental shelf becoming dry land. This

made it possible to walk between Australia and New Guinea, and between Victoria

and Tasmania. Flood, (1995), describes how there was probably only a 90 km gap

of open ocean between Australia and Asia when the sea level was low. It is

thought that this enabled the first Australian’s to ‘island hop’ their way

through Asia to the north-west of Western Australia. Regardless of the actual

colonisation date, it is believed that Aboriginal people occupied most of

Australia by 35,000 (at least all favourable environments) (Flood, 1995).

Therefore, Aboriginal people would have of the environment in which they lived

with the megafauna. The exact nature of the co-existence between aboriginal

people and the megafauna is still controversial. Food for Thought I find it hard

to believe, being someone who has come into contact with mankind, that the first

Australian’s would pass up on the opportunity that the megafauna presented. The

megafauna would appear to have provided the Aoborigines with an excellent source

of food. Flannery, (1994) states that when Charles Darwin visited the Galapagos

Islands in 1835, he noticed the relative tameness of the animals there, and

proposed that it due to isolation of the islands. Australia has had quite a

unique history in that it as been physically isolated from the rest of the

world’s landmasses for over 40 million years. This long period of isolation has

given rise to an unique flora and fauna, that was largely derived from the

ancient supercontinent Gondwana. Flannery suggests that the absence of

significant carnivores in Australia, together with its long isolation, evolved

fauna that were naive to predators, let alone highly skilled hunter gatherers.

It was this naivity of the animals that contributed to their extinction. These

statements are problematic due to the lack of evidence to support them. Much

effort has been made in the search of evidence to support humans hunting

megafauna. This effort has only produced associations between humans and

megafauna (e.g. human artefacts and megafaunal bone). It should be noted that

these associations do not prove that megafauna were actively hunted, only that

they co-exsist in the same environments. There are Aboriginal legends that

describe how they hunted "giant kangaroos" (Flood, 1995). Flood also

describes how in the Northern Territory artwork has been found that many believe

depict Diprotodon. At Lake Menindee, NSW, bones of both extinct and modern

species have been found along with fireplaces and ‘Kartan-type’ stone tools (’Kartan’

is named after the large tool industry that was found on Kangaroo Island, SA) (Tindale,

1955). More recently, Liverpool plains in north-eastern NSW has produced three

sites which claimed to have humans associated with megafauna (Flood, 1995). Lime

Springs, is the only site of the three in which the findings have been

published. Lime Springs revealed many burnt bones belonging to Procoptodon,

Diprotodon, Macropus titan, Protemnodon, and Sthenurus, clearly associated with

stone tools and campfires in a stratigraphic succession. The sediments at Lime

Springs have been dated at 6,000 but as explained above they have been

interpreted as being reworked. Flood, believes that what probably transpired was

that a group of Aboriginal people camped on top of a sediment layer containing

megafaunal bones, the bones were burnt by their cooking fires, then everything

was subsequently blown into the swamp. There are other sites that show clear

associations between megafauna and humans such as: incisions and charring of

bones at Mammoth Cave, WA, (Archer et al., 1980); and aboriginal middens and

megafaunal bones at Lake Tandou Lunette western NSW, (Hope et al., 1983). What

scientists needed was direct evidence of slaughtering of the megafauna. On other

continents this problem was easily solved by the presence of abundant kill sites

(Martin, 1984). In Australia we have not as yet discovered major kill sites. At

a megafaunal site in south-western Victoria, Spring Creek many bones have been

found with cut marks on at least 3.8% of all the post cranial elements (Vanderwal

and Fullagar, 1989). Most of the marks are thought to have been a result of

Thylacoleo carnifex (Fig \*\*\*) gnawing on the bones. In 1984, a Diprotodon tooth

was found at the site that had twenty eight grooves notched into the surface of

it. It is almost certain that these grooves are man made (Fig \*\*). It would be

very difficult to believe that Thylacoleo would have made such perfect grooves

in the tooth, and there is also the question why an animal would chew on a tooth

in the first place. Vanderwal and Fullagar suggest that that the engravings on

the tooth might be "tally marks for an ephemeral activity, or perhaps

doodles while passing away time". The only direct evidence that suggests

that Aboriginal people actively hunted megafauna comes from semi-arid NSW, at

the Cuddie Springs site (previously mentioned). Researches have found stone

tools within the succession with blood and hair on them, which was positively

identified to belong to Macropus titan and Diprotodon (Flood, 1995). This was

done by extracting DNA from bones of extinct species and then matching their

‘fingerprint’ with that of the blood residues on the stone tools. Flood points

out that this work is as yet unpublished. Nevertheless it indicates that

Aboriginal people were at least scavenging the carcasses of the dead megafauna.

How it Transpired The extinction of the megafauna is a subject that I believe

will remain controversial for years to come. Many theories have been proposed

that have a high degree of validity, but in general there are two schools of

thought when it comes to megafaunal extinction. Those that believe it was

climate induced, and those that believe that it was Anthropocentric (Flannery,

1994). Unfortunately this essay has not focused on the climatic model. If it

had, maybe my conclusions would be different. The essence of the model is that

Pleistocene megafaunal extinctions were a direct result of a dramatic world-wide

climate change (Horton, 1990). The environment changed too fast for the animals

to cope with and hence they died out. Several weaknesses with the climatic model

have been noted. The majority of the megafauna in Australia has managed to

survive 16 out of the last 17 major glaciations (Flannery, 1995); Pleistocene

extinctions occurred at different times and at different intensities in

different landmasses; There hasn’t been a good explanation as to why so many of

the larger taxa became extinct and so few of the smaller taxa (Flood, 1994).

Aboriginal people coexisted with megafauna in Australia for at least 30,000

years. They lived in the same environments at the same time, evident by the

bones from both groups that have been found together in sediments. The way in

which the megafauna and humans interacted is still uncertain. There is growing

evidence, such as blood on stone tools and an engraved Diprotodon tooth, that

suggests that humans actively predated on the megafauna. An Extinction Scenario:

Humans first arrived in Australia gradually spreading around the continent using

fire and hunting. The megafauna were relatively slow moving and naive to

predators. The megafauna that survived the initial impact of human hunters,

finally died at the end of the Pleistocene when the Australia was undergoing the

driest period it had

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