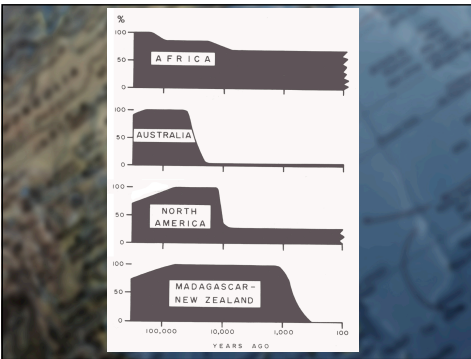


5



6

Table 10.2 Extinctions of large mammal genera over the last 100 000 years

	Extinctions	Living	Total	Extinction (%)
Africa	7	42	49	14.3
N. America	33	12	45	73.3
S. America	46	12	58	79.5
Australia	19	3	22	86.4

North America

- 23 genera of large mammals went extinct over a period of 3ma, prior to Wisconsin glaciation
- at end of Wisconsin glaciation 33 genera go extinct in a shorter period, all members of 7 families, including Proboscideans, Equids and Cameloids.

Australia

- large mammals including giant wombats and kangaroos and the hippo-sized Diprotodon went extinct.
- extinctions of giant birds are only a few thousand years old and clearly correspond to the arrival of humans.

Some workers in looking at unusually high rates of species origination in NAm in the Neogene say that the high rates of extinction are not unusual and are to be expected.

7

Three Extinction Hypotheses

- Humans are to blame
- Climatic changes and biotic instability are to blame
- As of 2007 new hypothesis involving *Bison bison*

8

Human Overkill

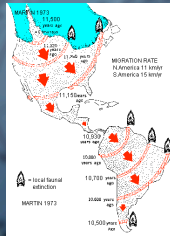
(Larry Martin)

- Extinctions seem to follow the appearance of humans in different parts of the world.
- Extinctions mainly seem to be in the megafauna.
- "Climatic explanations are implausible".

9

Why?

- The first is that human over-hunting directly caused the extinction.
- The second is that over-hunting eliminated a "keystone species" (usually the mammoths or mastodon) and this led to environmental collapse and a more general extinction.



10

Human Overkill

Problems

- Why no significant late Pleistocene extinctions in Africa where humans had been around for a long time.
- Hunting induced extinctions should leave abundant evidence of kill sites - yet there are none.
- This hypothesis fails to explain the simultaneous extinctions of mammalian and avian species not obviously vulnerable to human overkill.
- Predicts ranges of megafauna should constrict as a semicircular front of approaching hunters comes in contact with them. This is not the pattern we see in the extinctions which are the reverse.

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Climate/Environment

- Actually a number of extinctions take place, each seem to be correlated with climate changes.
- Argued that extremely rapid decline in non-exploited mammal species and extinction patterns indicate climate differences.
- It is not just climate changes, but the accompanying biotic reorganization of biotas that is also partially to blame
- There were many glacial/interglacial cycles but no extinction patterns

Main problem is that this is difficult to test.

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Bison bison



- 2007 SVP meeting new hypothesis floated that seems to make sense
- Now know that the modern bison didn't appear until ca 200ka - during the last ice age
- Apparently earlier bison don't show the giant herd capability of the modern bison
- Hypothesis is that modern bison exploded during deglaciation and basically stressed ecosystems

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Conclusion

More than likely that climate and human interaction - exacerbated by modern bison in North America - are to blame [depending on when and where the extinctions occurred].

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