

since the Age of Exploration began,
it has become progressively clearer that

**different parts of the world support
greatly different assemblages of organisms**

two aspects to this matter:

Description - what is the pattern?

Analysis - how did the pattern arise?

<http://publish.uwo.ca/~handford/zoog1.html>

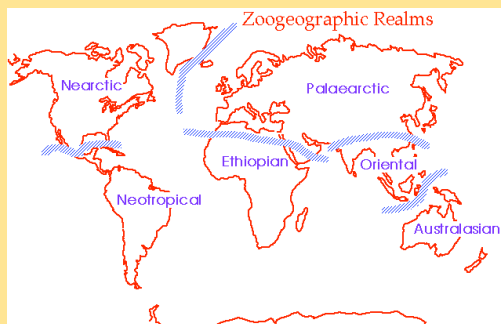
the geographical pattern of life's kinds
is not *haphazard* or *random*...

**in general, continental biotas are uniform,
yet distinct from others, sometimes greatly so**

**elements of a given biota tend to be
more closely-related *among themselves*
than with those of other continents**

Wallace described this in his global system of
Zoogeographical Realms

Wallace's Realms *almost*....



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.....correspond to continents 3

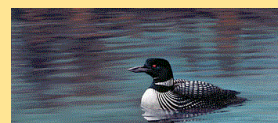
Nearctic Realm

Gaviidae - Loon



Antilocapridae
Pronghorn

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this realm has no endemic
bird families.

But Loons are endemic
to Holarctic Realm =
Nearctic + Palearctic

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Palearctic Realm



panda

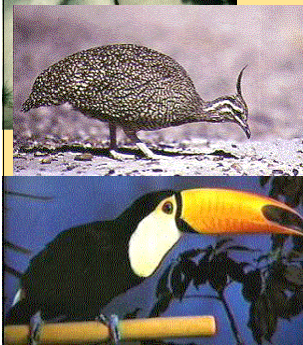
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grouse

Photo by Rob Bernette

Neotropical Realm



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this realm is truly the
"bird-realm"

a great number of
families are endo
including
a lot of this

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Ethiopian Realm

lemur aardvark

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Oriental Realm

gibbon

leafbird

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Australasian Realm

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wallabies & kangaroos - marsupials

so continental biotas are distinct;
but they are not **equally** distinct

79 families of terrestrial mammals

| REGIONS | near. | neotr. | palæar. | ethio. | orien. | austr. |
|---------------|-------|--------|---------|--------|--------|--------|
| nearctic | 4 | | | | | |
| neotropical | 6 | 15 | | | | |
| palæarctic | 5 | 2 | 1 | | | |
| ethiopian | 0 | 0 | 11 | | 16 | |
| oriental | 1 | 1 | 10 | 12 | | 5 |
| australian | 0 | 0 | 0 | 0 | 0 | 10 |
| TOTALS | 14 | 22 | 19 | 31 | 20 | 10 |

51/79 = 73% endemic to realms

68% 52%

how do we explain these patterns of endemism and sharing of regional biotas?

life and the planet both have **A VERY LONG HISTORY** during which they have both changed

as life has changed and diversified so the earth's surface has provided changing opportunities for colonization - sometimes restricted, sometimes broad

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today's organisms are all descendants of lineages which have **UNIQUE ORIGINS**

UNIQUE IN TIME & SPACE

time/space coincidences of group origins influence today's distribution of groups

but after group's origination, **GEOGRAPHY CHANGES**

isolation disappearance
connection break-up

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CONTINENTAL DRIFT

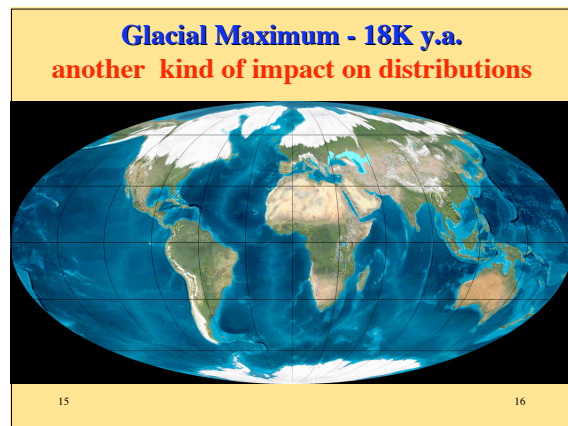
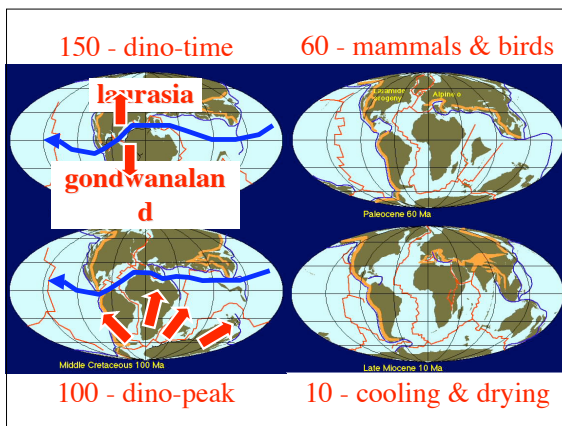
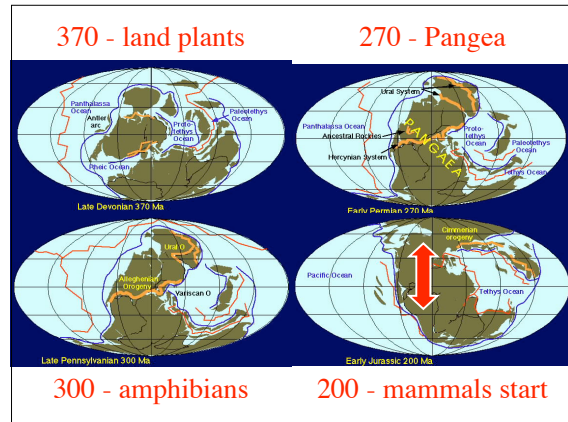
as land-masses skate about, separating & colliding, biotic lineages are evolving

where you originate and *what happens to where you originate* profoundly affects your future prospects

distribution is a dynamic phenomenon, shifting with time & circumstance

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several **reptile & amphibian** lineages evolved **before** the split-up of Pangea; they \therefore show little regional endemism

but most **bird & mammal** divergence took place during Cenozoic (well after the break-up)

therefore these groups show **clearest patterns**

most distinctive = most isolated (during key periods)

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fundamentals of distribution are \therefore provided by **deep history of continents & biota** as they change

but also relevant are organisms' capacities for **dispersal, migration and nature of barriers**

"perceived" barriers:
mountain ranges deserts oceans

migrations can blur "homeland" patterns

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a biogeographic puzzle - solved



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NEXT CLASS

Global Climate,
Productivity
& Soils

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