

BIOGEOGRAFIA

Estudo da distribuição dos organismos no presente e no passado.

Ciência que busca explicar os padrões de distribuição de espécies e grupos taxonômicos superiores.

Fitogeografia – Zoogeografia

Biogeografia Histórica – Biogeografia Ecológica

Paleobiogeografia

Biogeógrafos notáveis dos séculos XVIII e XIX

1700 1720 1740 1760 1780 1800 1820 1840 1860 1880 1900 1920 1940 1980

Carl Linnaeus (1707 – 1778)

Carl Willdenow (1765 – 1812)

Alexander von Humboldt (1769 – 1859)

Charles Darwin (1809 – 1882)

Joseph Hooker (1817 – 1911)

Alfred Wallace (1823 – 1913)

Philip Sclater (1829 – 1913)

Ernst Haeckel (1834 – 1919)

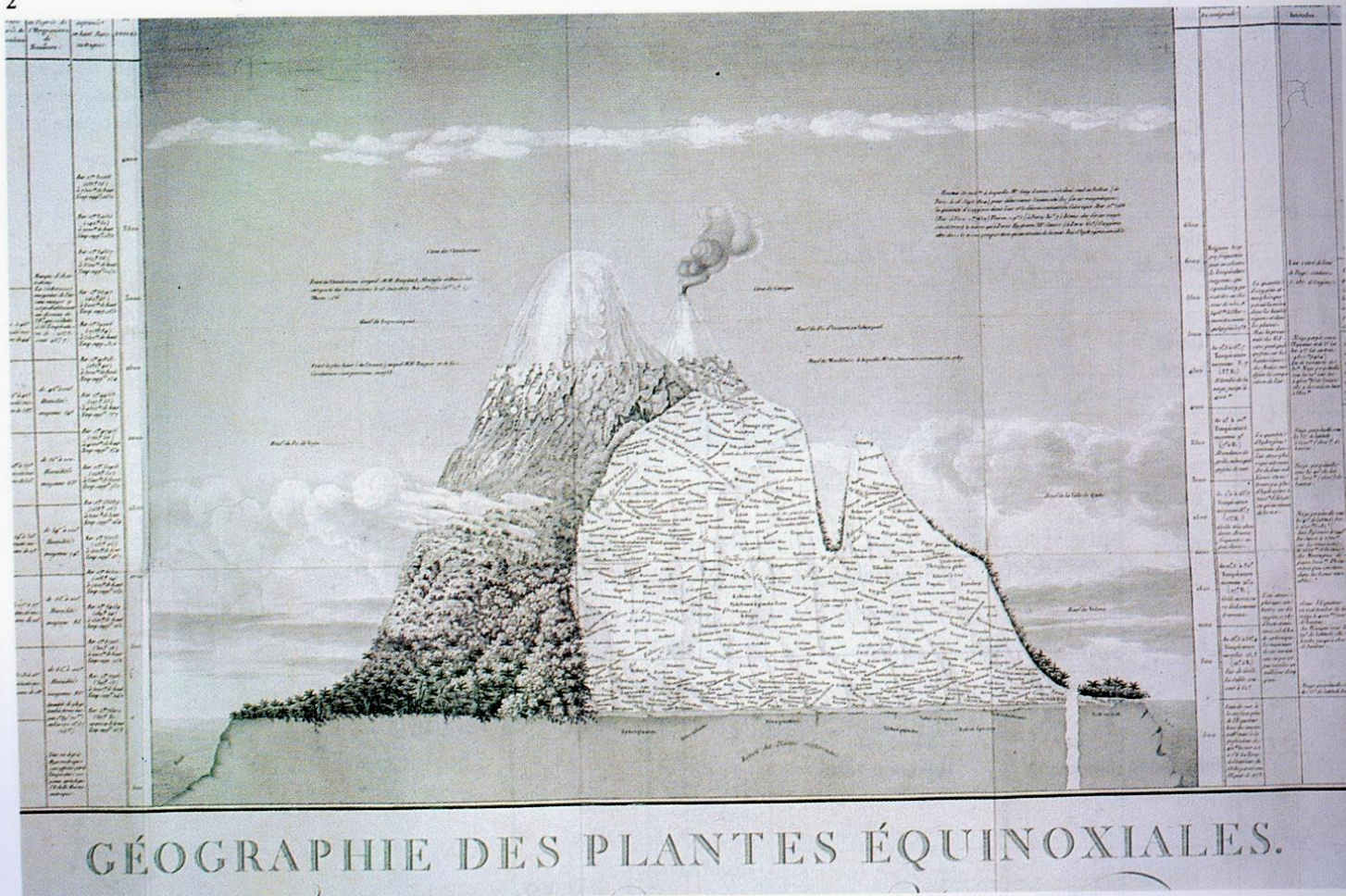
Alfred Wegener (1880 – 1930)



Alexander von Humboldt “Pai da Fitogeografia”

Alexander von Humboldt (1760-1859)

Naturalista y geógrafo redescubridor científico de América. Humboldt exploró las zonas norte, central y amazónica del territorio ecuatoriano, durante los meses de enero a agosto de 1802, y posteriormente durante el mes de enero de 1803, realizó estudios en el golfo de Guayaquil. Aquí concluyó sus manuscritos sobre la *Geografía de las plantas*, obra inspirada en las fajas vegetales altitudinales de las cordilleras desde el nivel del mar al piso nival del Chimborazo, a 6.310 metros de altura.



“Lienzo sobre la naturaleza en los Andes” (1799) se denomina el cuadro de la época. Este cuadro era el único adorno en la habitación y lecho de muerte de Johann Wolfgang von Goethe en Weimar.

La medida utilizada en la indicación de altura es de 3400 hexápodos: un hexápodo equivale a 195 cm. Es decir que en el Chimborazo que está marcado con 3400 hexápodos, tiene la altura de 6630 m.

La obra de Humboldt “Geografía de la Botánica” nos muestra la distribución geográfica de las plantas y nos ofrece una fundamental disertación sobre la botánica.

Alexander von Humboldt (1769 – 1859)

HUMBOLDT

1805 - “Geographie des plantes”

(um dos 30 volumes da *Voyage aux régions équinoxiales...*)

– colaboração de Aimé Bonpland

1808 – “Ansichten der Natur”

- história de vida de várias plantas e aspectos da vegetação das terras que visitou

1858 – “Kosmos”

-obra enciclopédica devotada a uma explanação abrangente do universo



[Georges-Louis Leclerc](#)

Comte Buffon
1707-1788

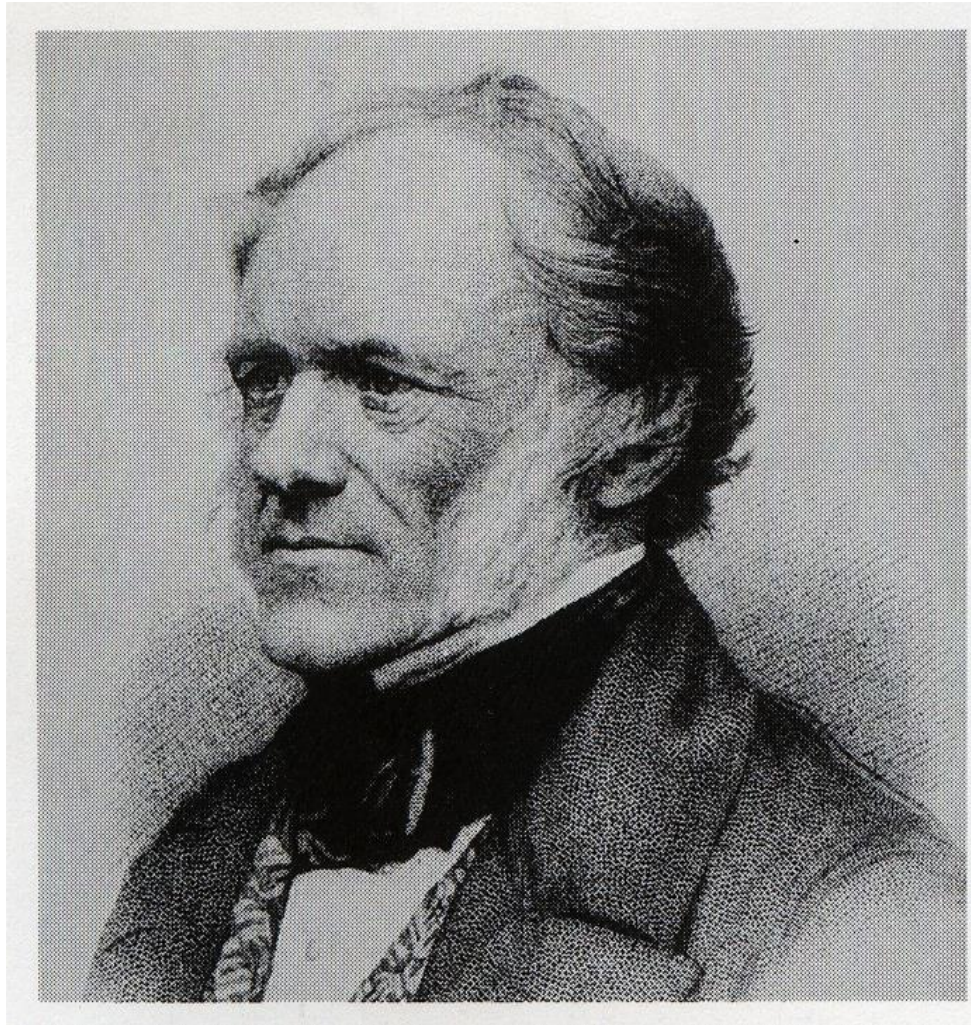


“Lei de Buffon”

Distintas regiões do globo, embora compartilhando as mesmas condições climáticas, são habitadas por diferentes espécies de animais e plantas.

Lyell 1830

**Principles
of Geology**

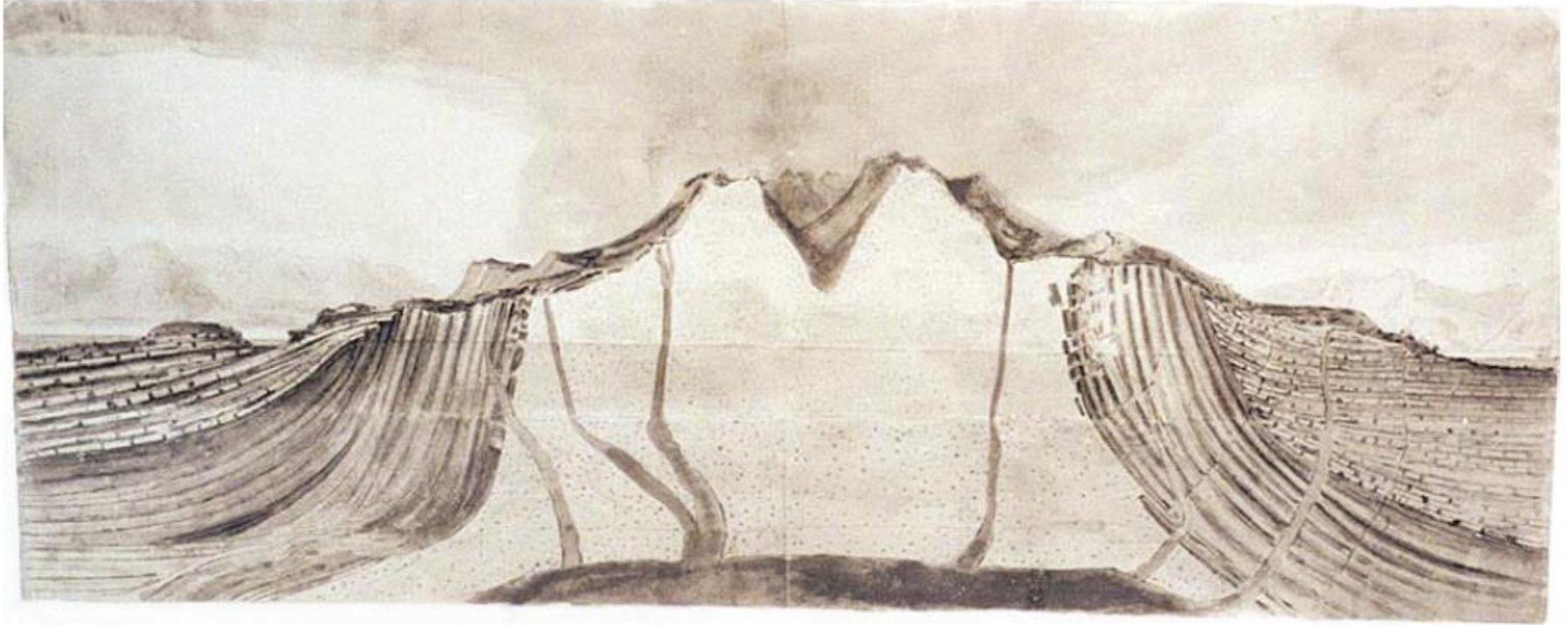


Atualismo
(Simpson 1970)
ou
Uniformitarismo
(Gould 1965)

Charles Lyell, often regarded as the “father of geology”, strongly influenced the development of biogeography in the nineteenth century, largely through his *Principles of Geology*, first published in 1830. (Courtesy of the Council of the Linnaean Society of London.)

Brown & Lomolino 1998

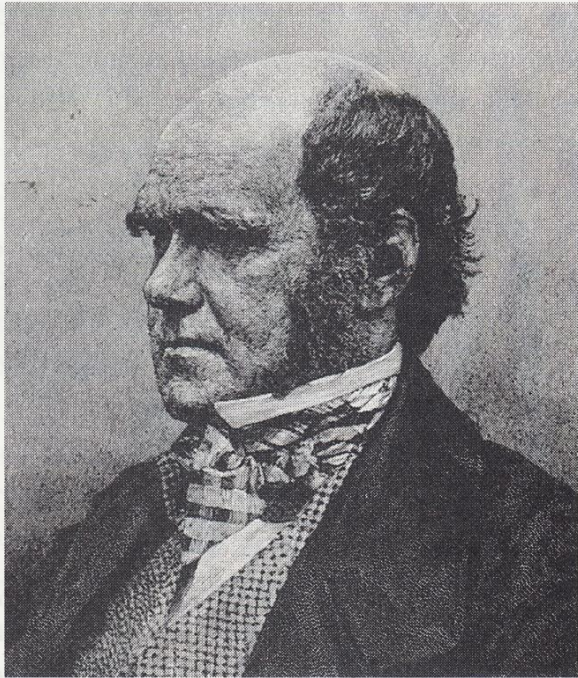
James Hutton fins do séc. XVIII



Hutton's geological observations, such as this watercolour, paved the way for uniformitarianism.

NATURE | VOL 409 | 18 JANUARY 2001 | www.nature.com

Alley, R.B. 2001
The key to the past?



Charles Darwin 1859

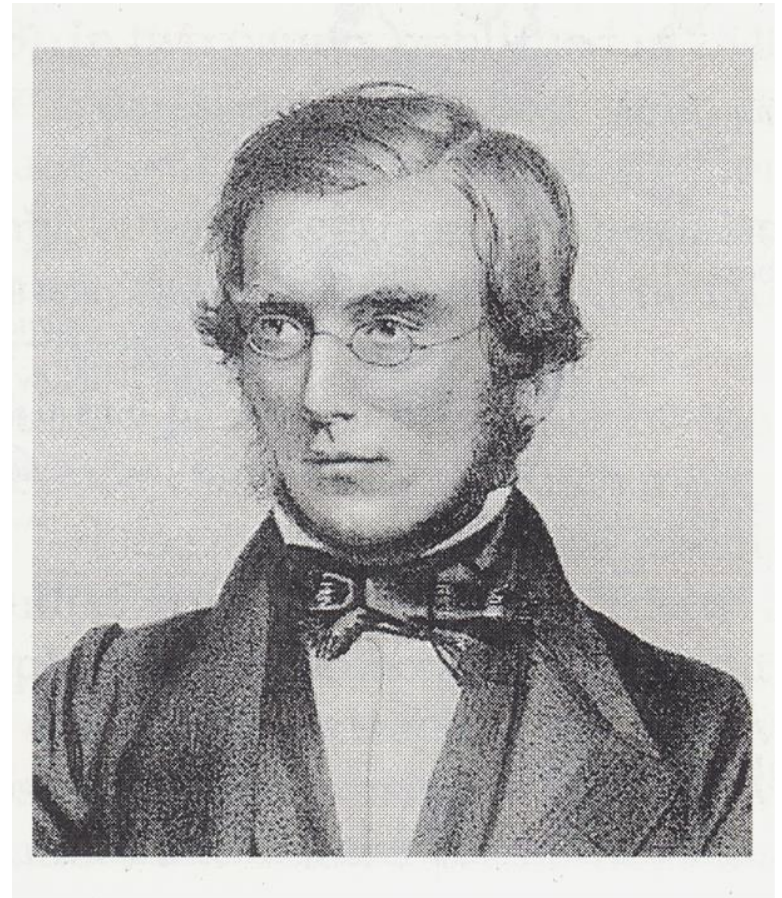
Alfred Wallace 1876
“Pai da Zoogeografia”



Joseph Dalton Hooker

**1835 – conexão pretérita entre
continentes do Hemisfério Sul**

**1840 – conceito de dispersão
a longa distância (ilhas)**



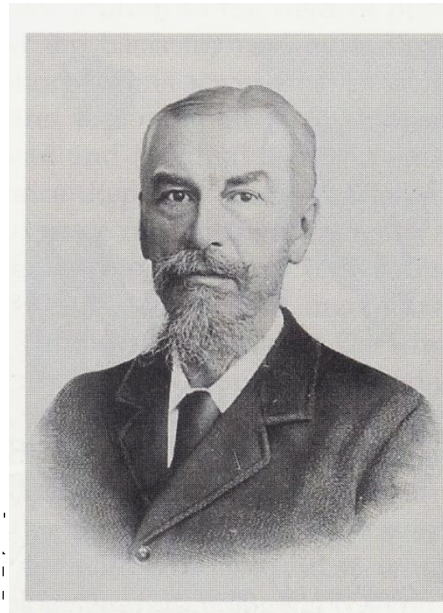
Augustin Pyramus de Candolle 1820: Introduziu o conceito de *áreas de endemismo* 20 regiões botânicas globais:

**Boreal : Ásia, Europa América
Europa S e N Mediterrâneo
Sibéria
Mediterrâneo
Europa E aos Mares Negro e
Cáspio
Índia
China, Indochina e Japão
Austrália
África S
África E
África W Tropical
Ilhas Canárias
EUA N
Costa NE da América do Norte
Antilhas
América Tropical
Chile
Brasil S e Argentina
Terra do Fogo**



Philip Lutey Sclater

- 6 regiões faunísticas



SCHEMA AVIUM DISTRIBUTIONIS GEOGRAPHICÆ.

CREATIO NEOGEANA

Sive Orbis novi.

12,000,000 square miles, }
3,000 species, } = $\frac{1}{4,000}$

V.

Regio Nearctica

Sive Boreali-Americana.

6,500,000 square miles,

660 species,

$\frac{1}{9,000}$

ORBIS TERRARUM.

45,000,000 square miles, }
7,500 species, } = $\frac{1}{6,000}$

CREATIO PALÆOGEANA

Sive Orbis antiqui.

33,000,000 square miles, }
4,500 species, } = $\frac{1}{7,300}$

I.

Regio Palæarctica

Sive Palæogeana Borealis.

14,000,000 square miles,

650 species,

$\frac{1}{21,000}$

VI.

Regio Neotropica

Sive Meridionali-Americana.

5,500,000 square miles,

2,250 species,

$\frac{1}{2,400}$

II.

Regio Æthiopica

Sive Palæotropica Hesperica.

12,000,000 square miles,

1,250 species,

$\frac{1}{9,600}$

III.

Regio Indica

Sive Palæotropica Media.

4,000,000 square miles,

1,500 species,

$\frac{1}{2,600}$

IV.

Regio Australiana

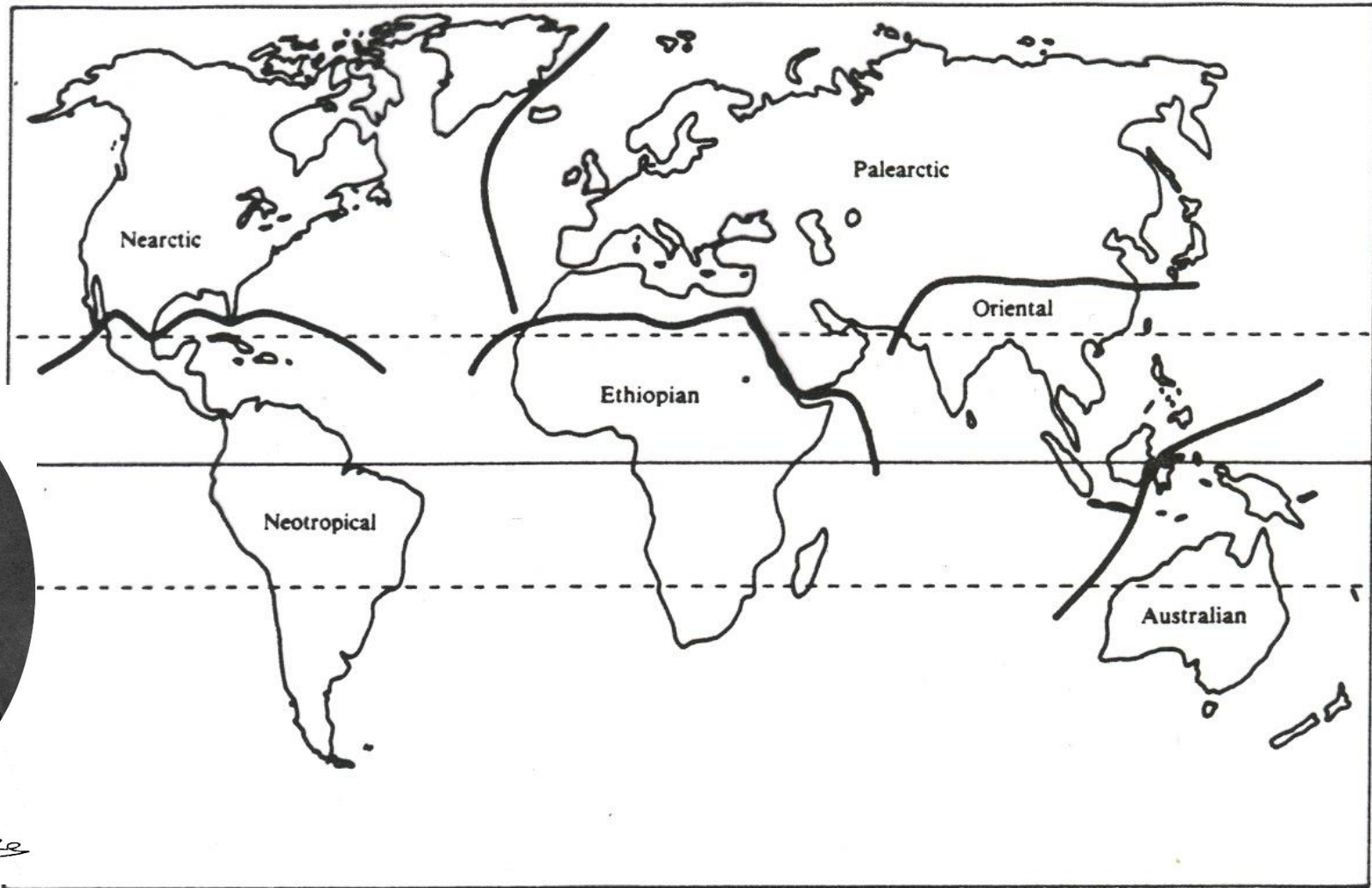
Sive Palæotropica Eoa.

3,000,000 square miles,

1,000 species,

$\frac{1}{3,000}$

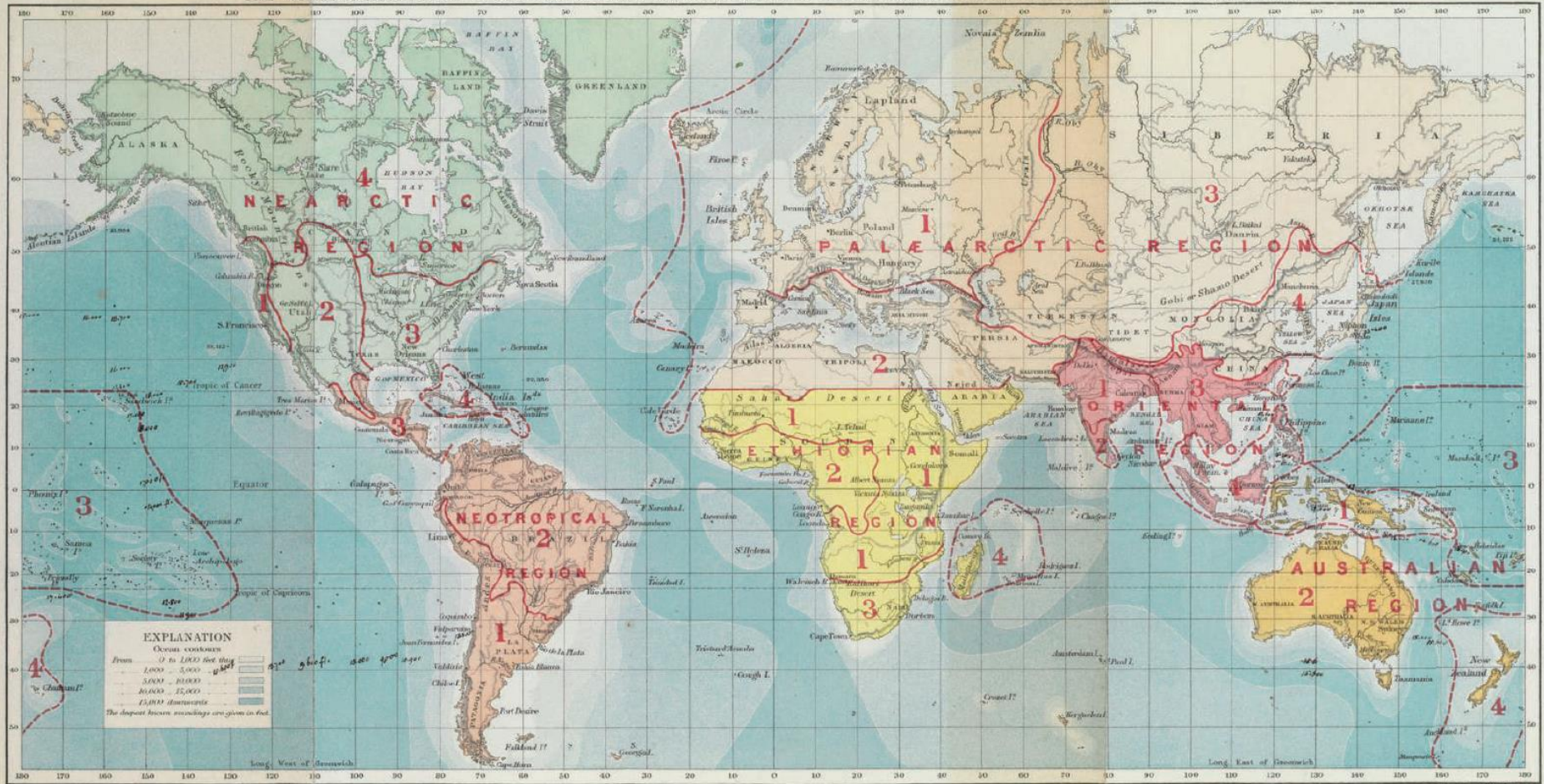
Sclater's (1858) classification of two creations and six regions, based on birds.



Major biogeographic regions reflect attempts of biogeographers to divide the landmasses into a classification reflecting the affinities of the terrestrial flora and fauna. The regions shown here are those described by [A.R. Wallace in 1876](#) and are still widely accepted today. This classification is similar to that proposed by Sclater (1858) for birds.

(Brown & Gibson, 1983)

THE WORLD ON MERCATOR'S PROJECTION SHOWING THE ZOOGEOGRAPHICAL REGIONS, AND THE APPROXIMATE UNDULATIONS OF THE OCEAN BED.



London: Macmillan & Co.

Grandes regiões zoogeográficas (e suas províncias)
A.R. Wallace (1876): Categorias hierárquicas.

**3 padrões básicos observados
pelos primeiros biogeógrafos:**

- 1. Todos os táxons são restritos a áreas particulares
(endemismo)**
- 2. Certos tipos tendem a ocorrer juntos
(provincialismo)**
- 3. Tipos semelhantes às vezes ocorrem
em áreas muito afastadas
(disjunção)**

Howard Reed 1942 – *A short history of plant sciences*. Cap. 19: Plant geography in the XIX century.

E. Warming 1895 – “pai da Ecologia Vegetal”

R. Good 1947 – plantas vasculares

S. Ekman 1953 – zoogeografia marinha

P. Darlington 1957 } vertebrados
G. Simpson 1965 }

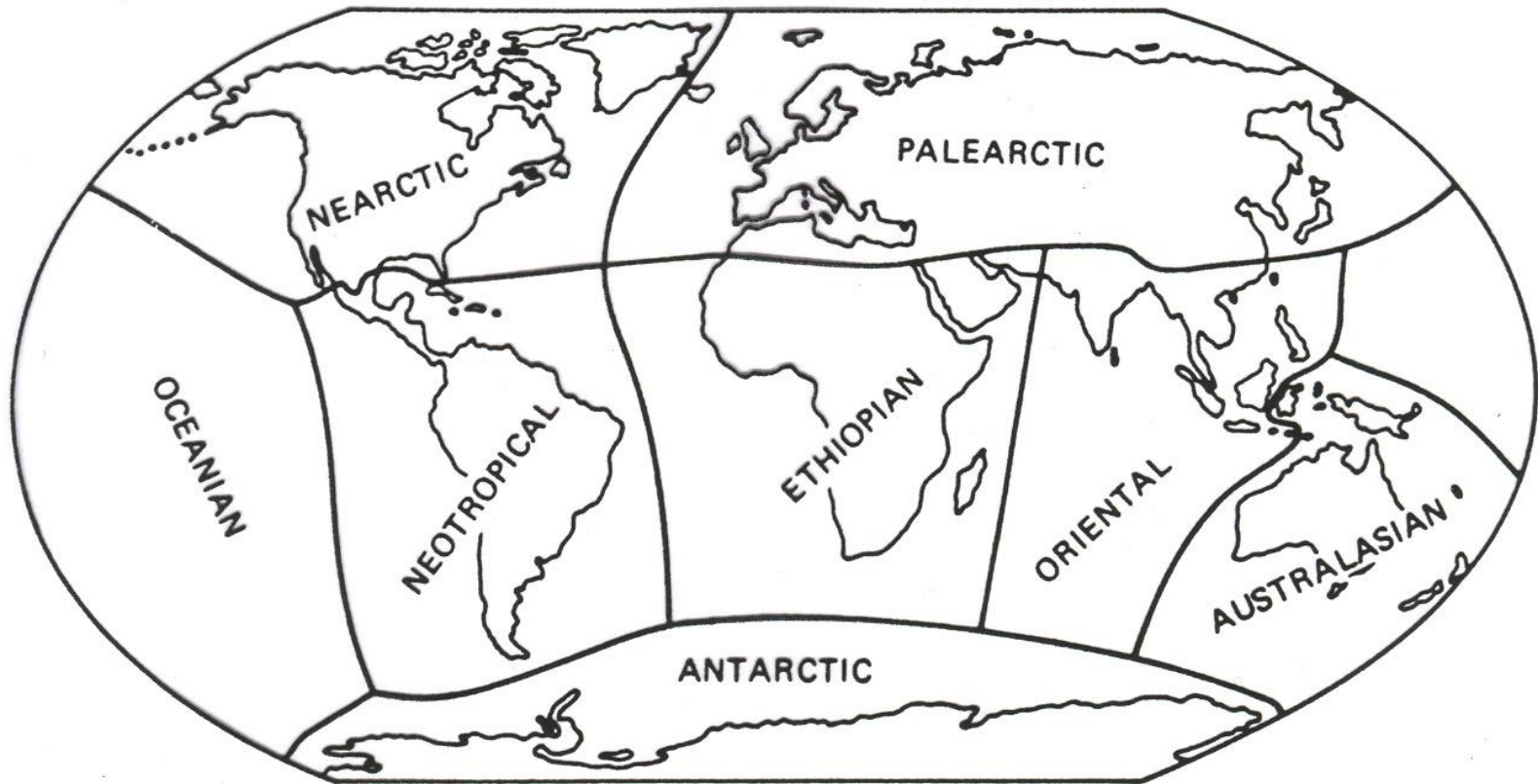
P. Dansereau 1957 – biogeografia ecológica

L. Croizat 1958 – panbiogeografia

S. Carlquist 1965 – ilhas

Século XX – muitos métodos analíticos

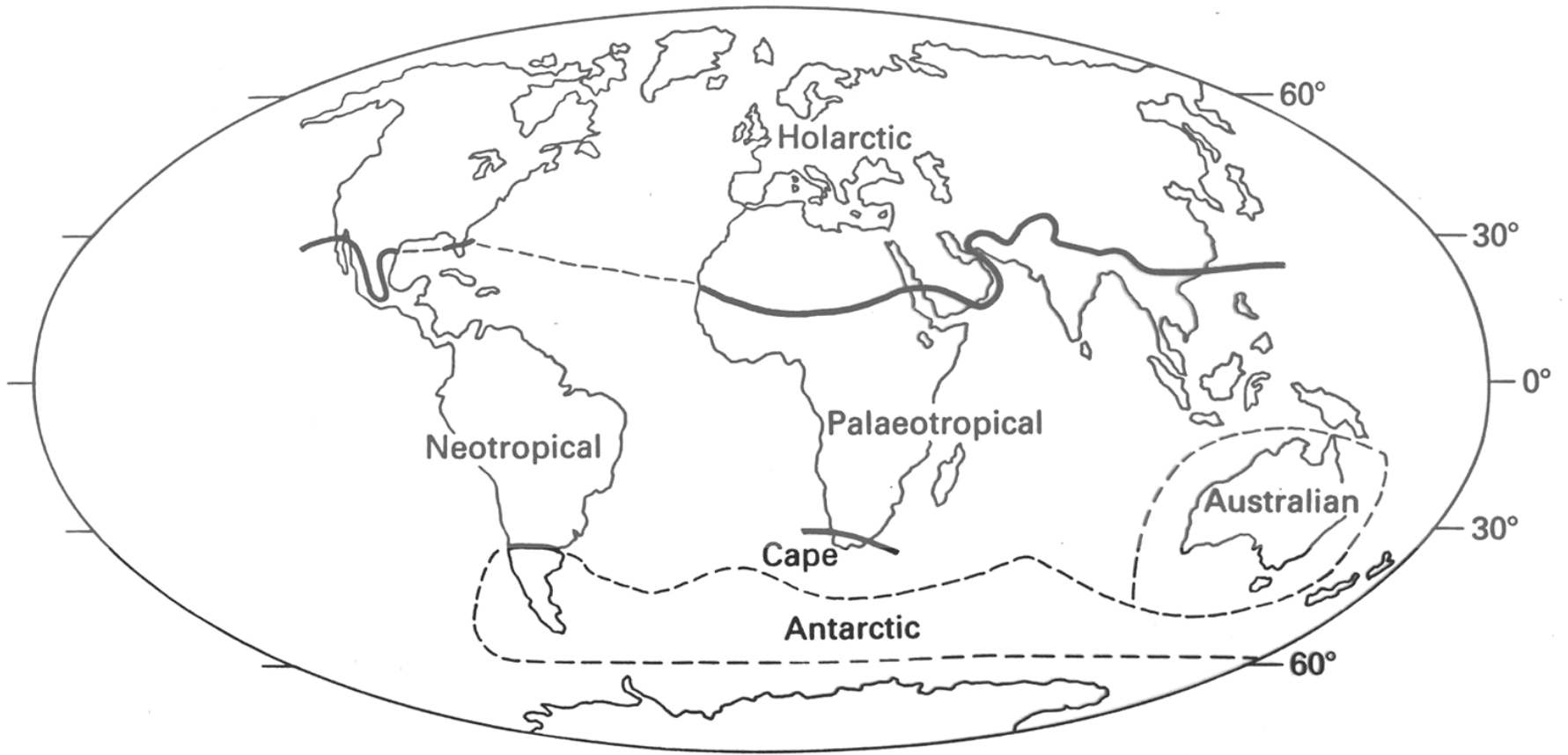
Biogeographic Subdivisions of the Earth



Biogeographic regions of the world.

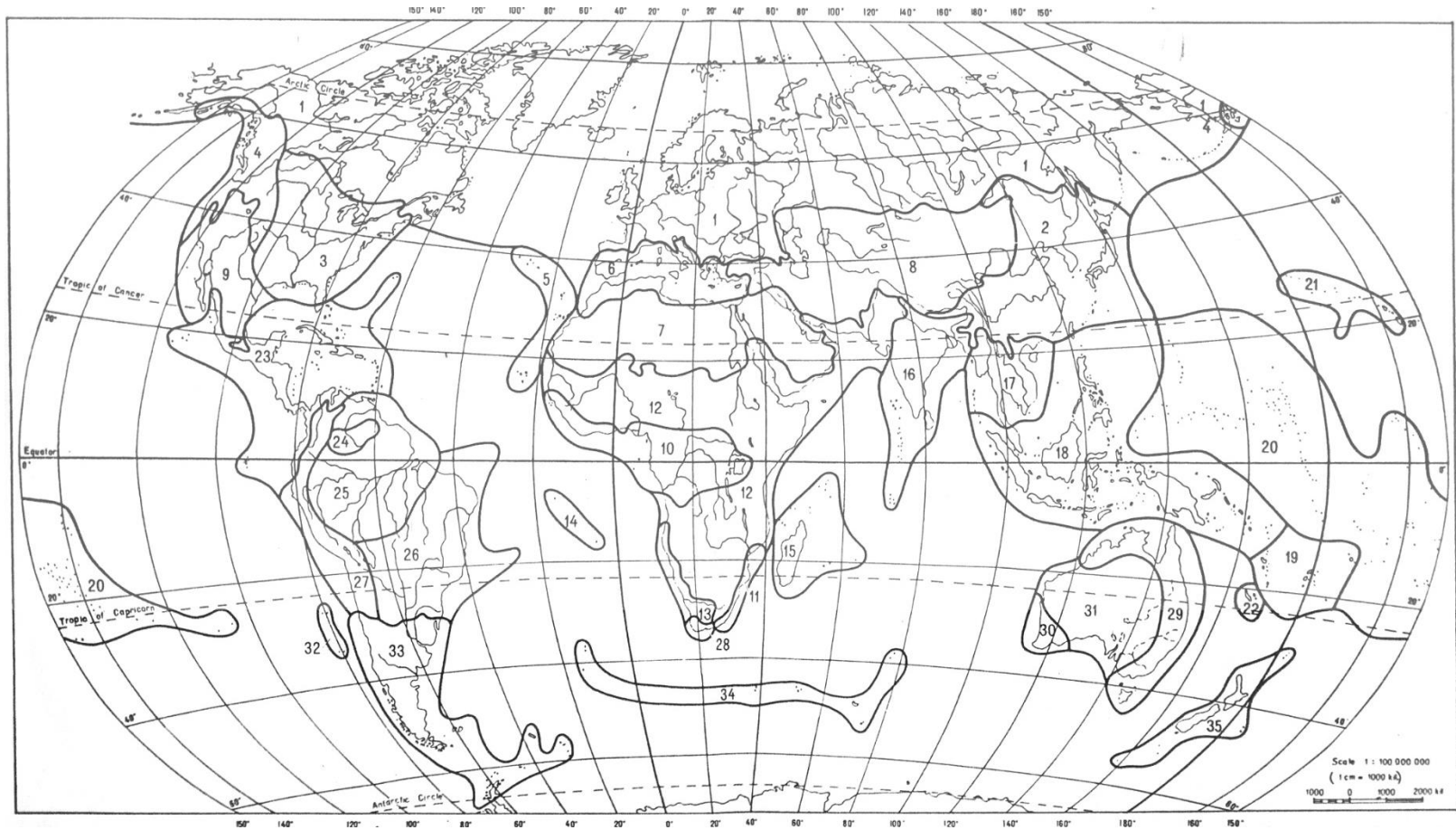
Compiled from several sources and combining zoogeographical and phytogeographical systems.

Pielou 1979



Reinos florísticos do mundo

Takhtajan 1986



FLORISTIC REGIONS OF THE WORLD

Takhtajan 1986

- 1, Circumboreal Region. 2, Eastern Asiatic Region. 3, North American Atlantic Region. 4, Rocky Mountain Region. 5, Macaronesian Region. 6, Mediterranean Region. 7, Saharo-Arabian Region. 8, Irano-Turanian Region. 9, Madrean Region. 10, Guineo-Congolian Region. 11, Uzambara-Zululand Region. 12, Sudano-Zambezi Region. 13, Karoo-Namib Region. 14, St. Helena and ascension Region. 15, Madagascan Region. 16, Indian Region. 17, Indochinese Region. 18, Malesian Region. 19, Fijian Region. 20, Polynesian Region. 21, Hawaiian Region. 22, Neocaledonian Region. 23, Caribbean Region. 24, Region of the Guayana Highlands. 25, Amazonian Region. 26, Brazilian Region. 27, Andean Region. 28, Cape Region. 29, Northeast Australian Region. 30, Southwest Australian Region. 31, Central Australian or Eremaean Region. 32, Fernándezian Region. 33, Chile-Patagonian Region. 34, Region of the South Subantarctic Islands. 35, Neozeylandic Region.

Ladler et al. 2015

Research trends in biogeography

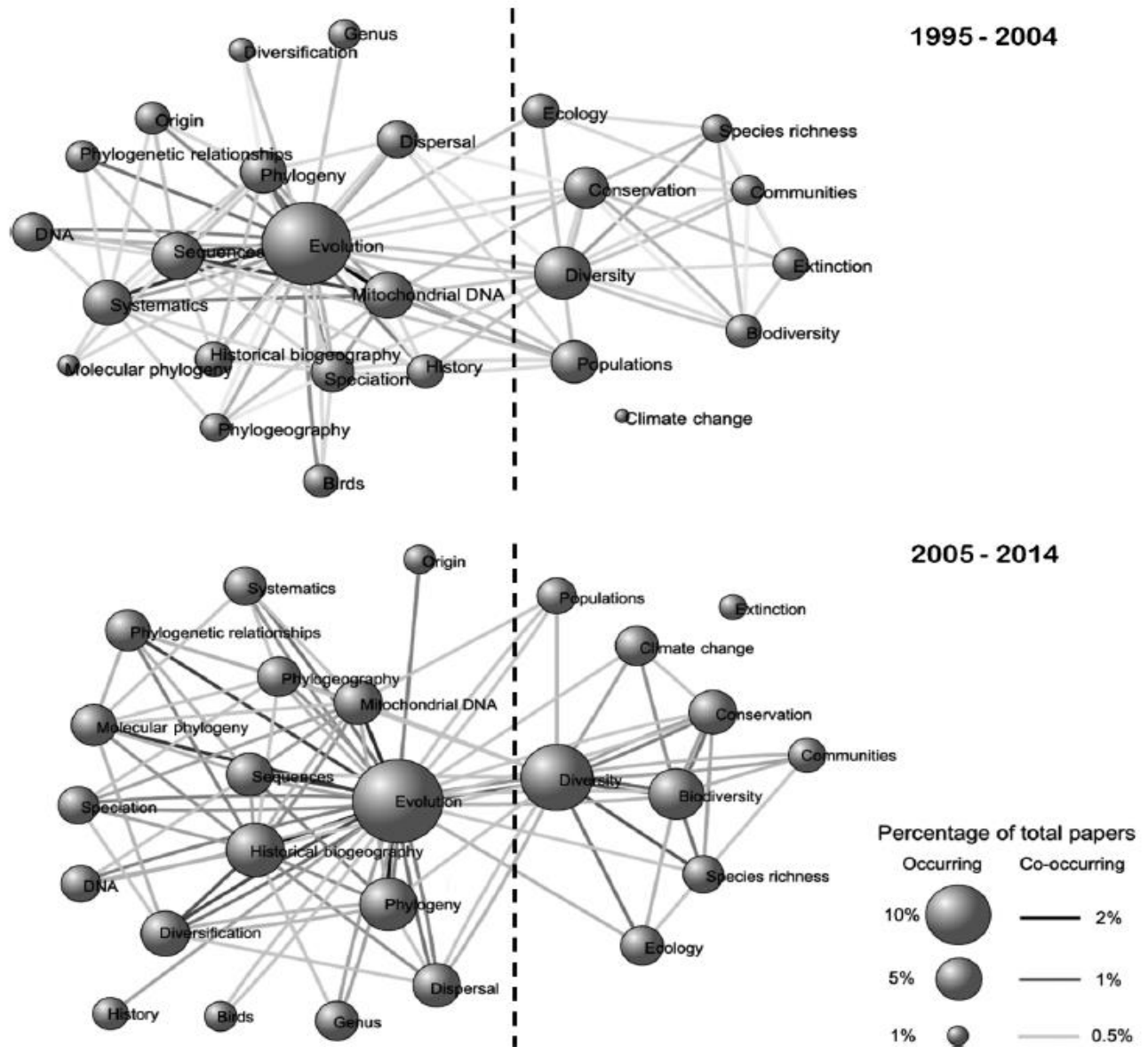


Figure 2 Network maps of keyword co-occurrence networks for biogeography papers published in 1995–2004 and 2005–2014. Networks include a subset of the 26 most frequently occurring keywords over both time periods. The size of network nodes reflects the percentage of total papers featuring each keyword, whereas the density of the connecting lines represents the number of keyword co-occurrences. The broken line represents the presumptive division between ecological and historical biogeography.