Anderson Academy

BIO 140 B · Binomial Nomenclature



Extracurricular: Biology

Lecture 2: Reading a Name: Roots, Pronunciation, Honorifics, Ranks and Name Changes

Names = tiny descriptions (not random codes!)

*Haliaeetus leucocephalus

sea eagle white head

White-headed sea eagle



Color Roots:

2.2

Leuco / Albus = White
(Eudocimus albus)

Leuco / Albus = White
(Eudocimus albus)

Rufus / Rubra = Red
(Furnarius rufus)



Cyano = Blue
(Cyanocitta)

Concolor = One color
(Puma concolor)

Coccineus = Scarlet
(Embothrium coccineum)

Nigra = Black | Viridis = Green

Size Roots:

Macro = Large → Acer macrophyllum (bigleaf maple)

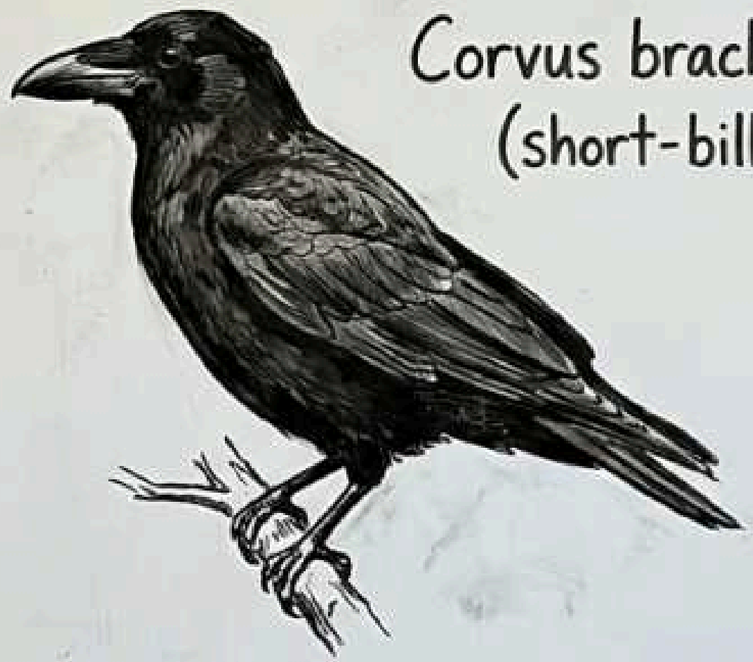
Micro = Small → Berberis microphylla (small-leaved)

Pumilio = Dwarf

Shape/Part Roots:

Phyllum = Leaf

Brachy = Short + Rhynchos = Beak



Corvus brachyrhynchos (short-billed crow)

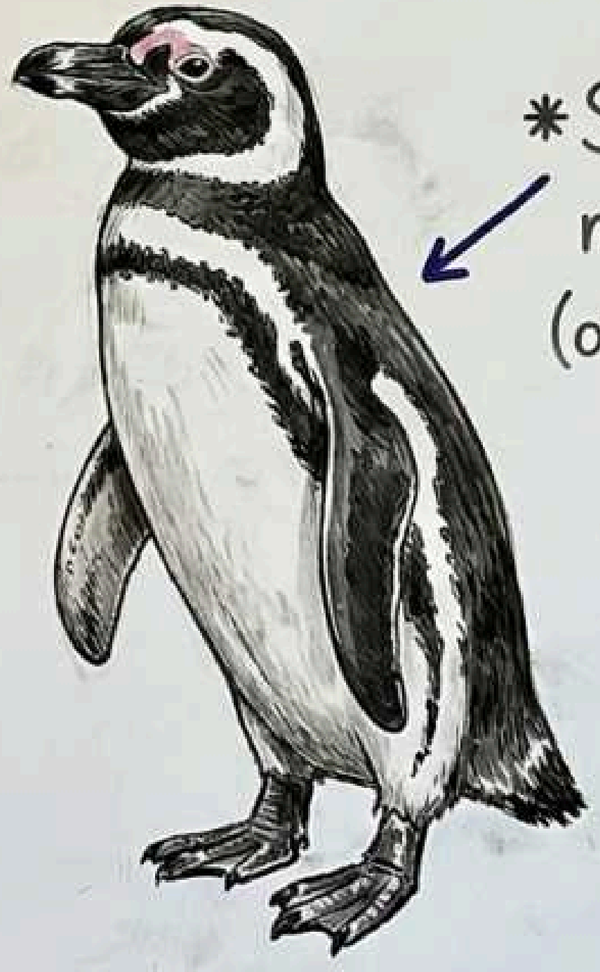
Place Words = "From or belonging to a place"

(where 1st specimen was found, not just where it lives today)



Suffixes: -ensis, -anus, -icus

* canadensis = of Canada
* mississippiensis = of the Mississippi
* chilensis = of Chile



* Spheniscus magellanicus (of the Strait of Magellan)

Honorifics (Naming for People):



Male: -i or -ii



Female: -ae

*Pseudotsuga menziesii &
Arbutus menziesii
→ Archibald Menzies

*Choloepus hoffmanni
→ Karl Hoffmann



*Cyanocitta stelleri
→ Georg Steller

Pronunciation: No single correct way!
(English or Spanish habits both work).

Rule 1: Say every vowel.

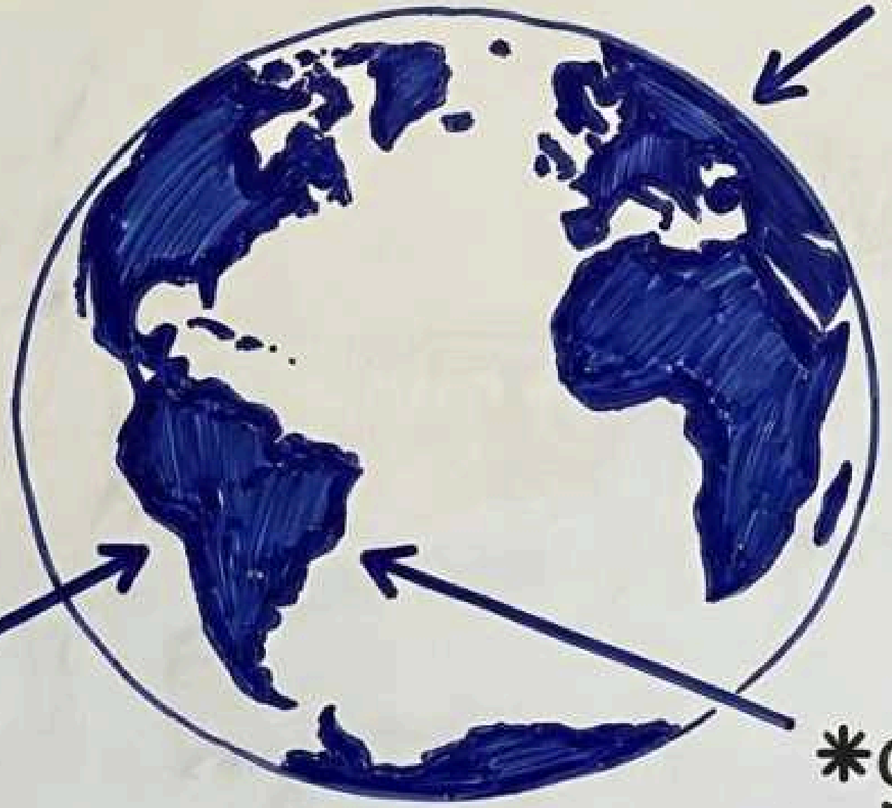
***Arbutus menziesii**
→ "men-ZEE-zee-eye"

Rule 2: "Ch" sounds like "k" (*Choloepus*).

Rule of thumb: Say it slowly and confidently.

Local Languages: Borrowed human knowledge.

*tshawytscha
→ Kamchatkan (Russian Far East)



*anhinga
→ Tupi
(Brazil)

*guanicoe
→ Quechua
(Andes)



The Decoding Routine:

1. Split (Genus & Epithet)
2. Find Roots (Colors, sizes, places, parts)
3. Check Endings (-ensis, -i, -ae)
4. Combine & Translate!

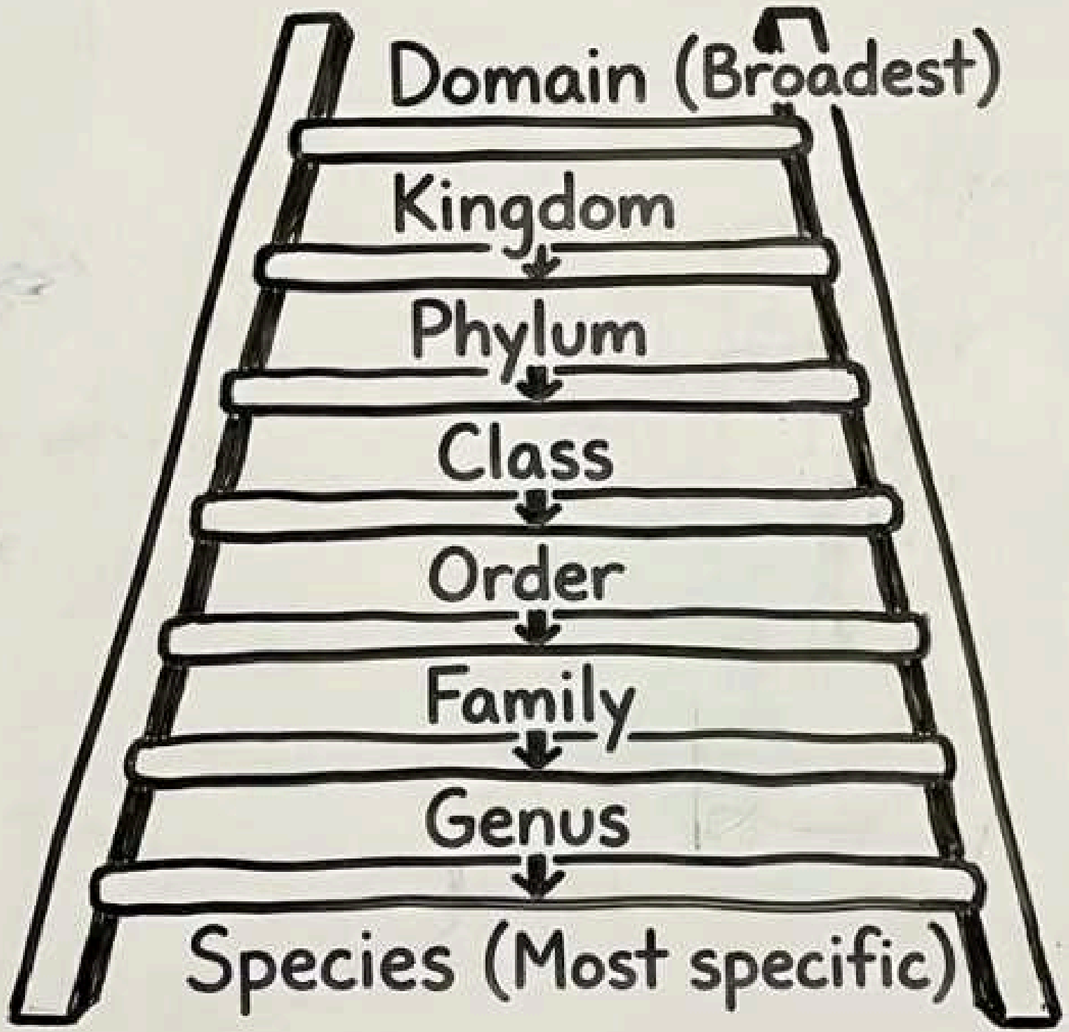
Practice:



Cyanocitta stelleri

Cyano (blue) + kitta (jay) + stelleri (Steller, a man) = Blue jay of Steller.

The Ladder of Ranks:



Memory trick: "Dear King Philip Came Over For Good Soup"

Climbing the Ladder:

Domain: Eukarya (Cells with nucleus)

Kingdom: Animalia (Animals)

Phylum: Chordata (Backbones)

Class: Aves (Birds)

Order: Pelecaniformes (-iformes = bird orders)

Family: Ardeidae (Herons/egrets)

Genus: *Ardea* (Large herons)

Species: *Ardea herodias*

(Only genus & species are slanted!)



Reading Family Names:



Ends in -idae

Animal families

Ardeidae (herons),
Corvidae (crows/jays),
Felidae (cats)



Ends in -aceae

Plant/Fungus families

Pinaceae (pines),
Fagaceae (oaks),
Bromeliaceae (pineapples)

Who decides? The Rule Books (Codes)



ICZN: International Code of Zoological Nomenclature (Animals)



ICN: International Code of Nomenclature for algae, fungi, and plants

Note: The Codes decide the *name*. Scientists decide the *grouping* (what counts as a species).

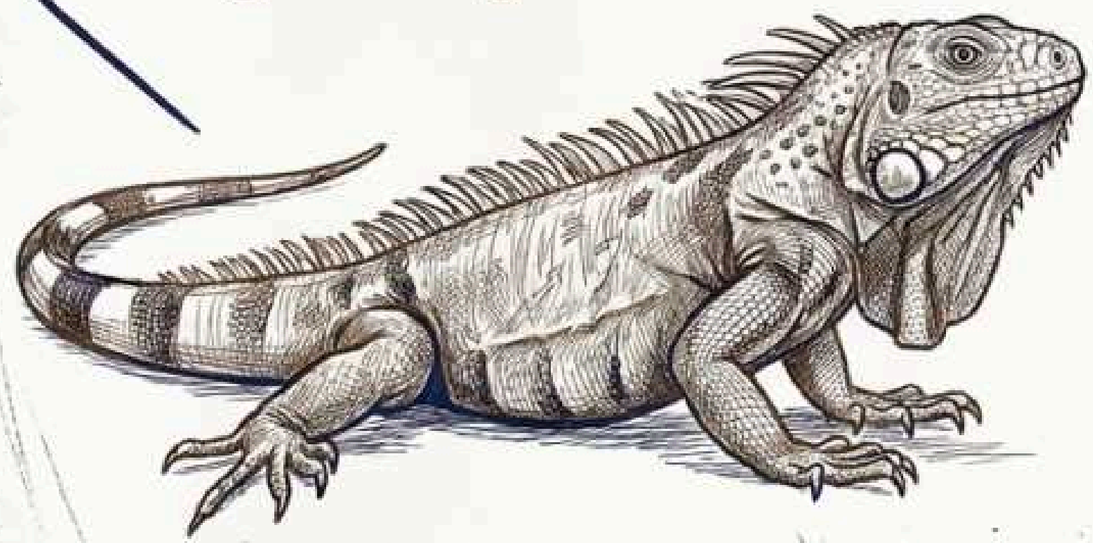
Code Differences:

[Zoology]

Allows Tautonyms (identical words)

*Anhinga anhinga

*Iguana iguana



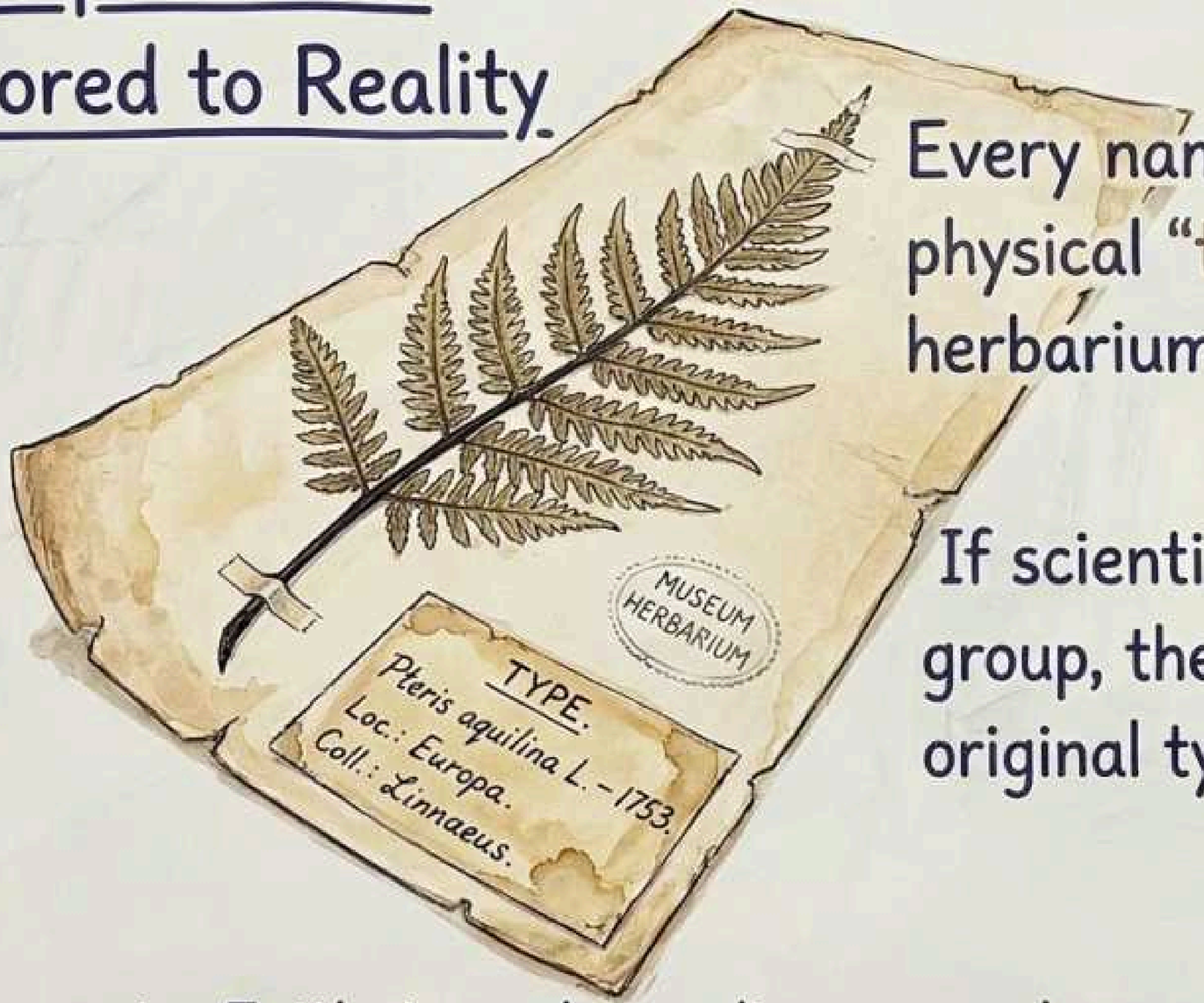
[Botany]

Forbids identical words

*Araucaria araucana
(monkey-puzzle tree - close, but not identical!)

Plant authors are abbreviated (e.g., "L." for Linnaeus)

Type Specimens: Anchored to Reality

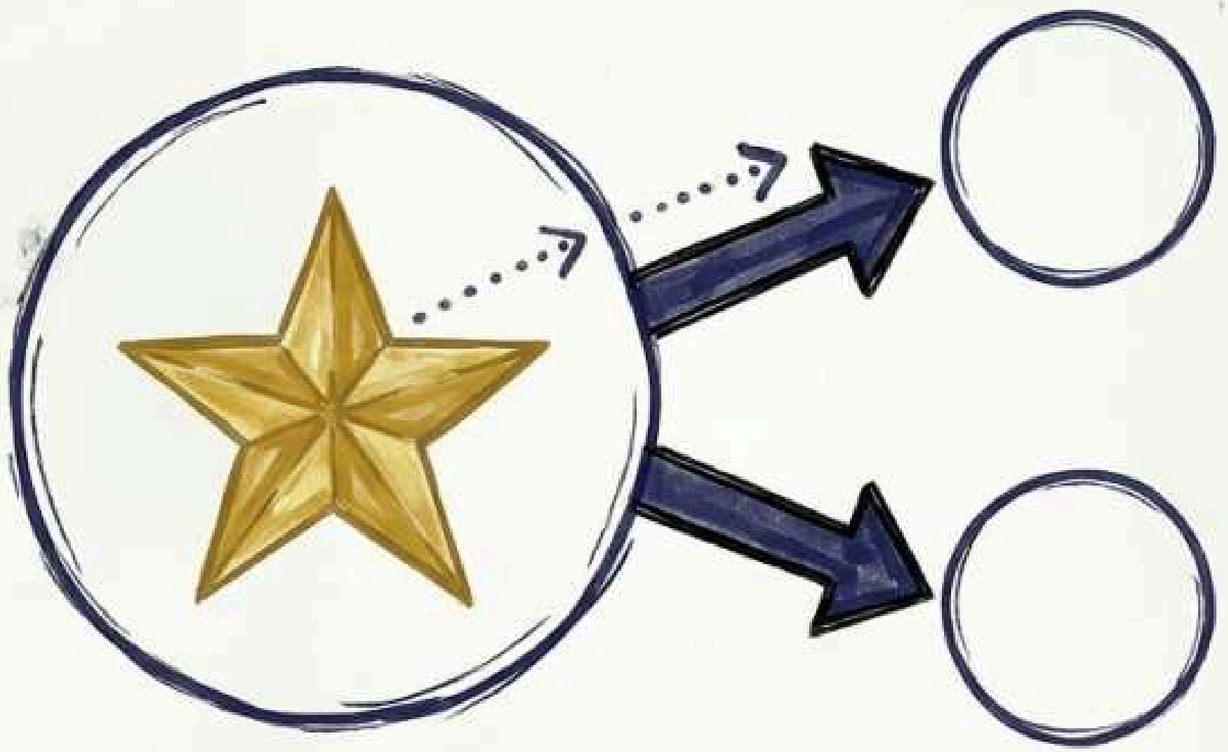


Every name is tied to a physical "type" (a museum or herbarium specimen).

If scientists disagree on a group, the group holding the original type keeps the name.

(Grammar note: Epithet gender endings may change to match a new genus).

Splits & Priority: When 1 Species Becomes 2



Path A [with Type Star]:
Keeps the old name.

Path B: Needs an older synonym or a brand-new name.

The Principle of Priority:
The earliest properly published name always wins.
This prevents chaos!

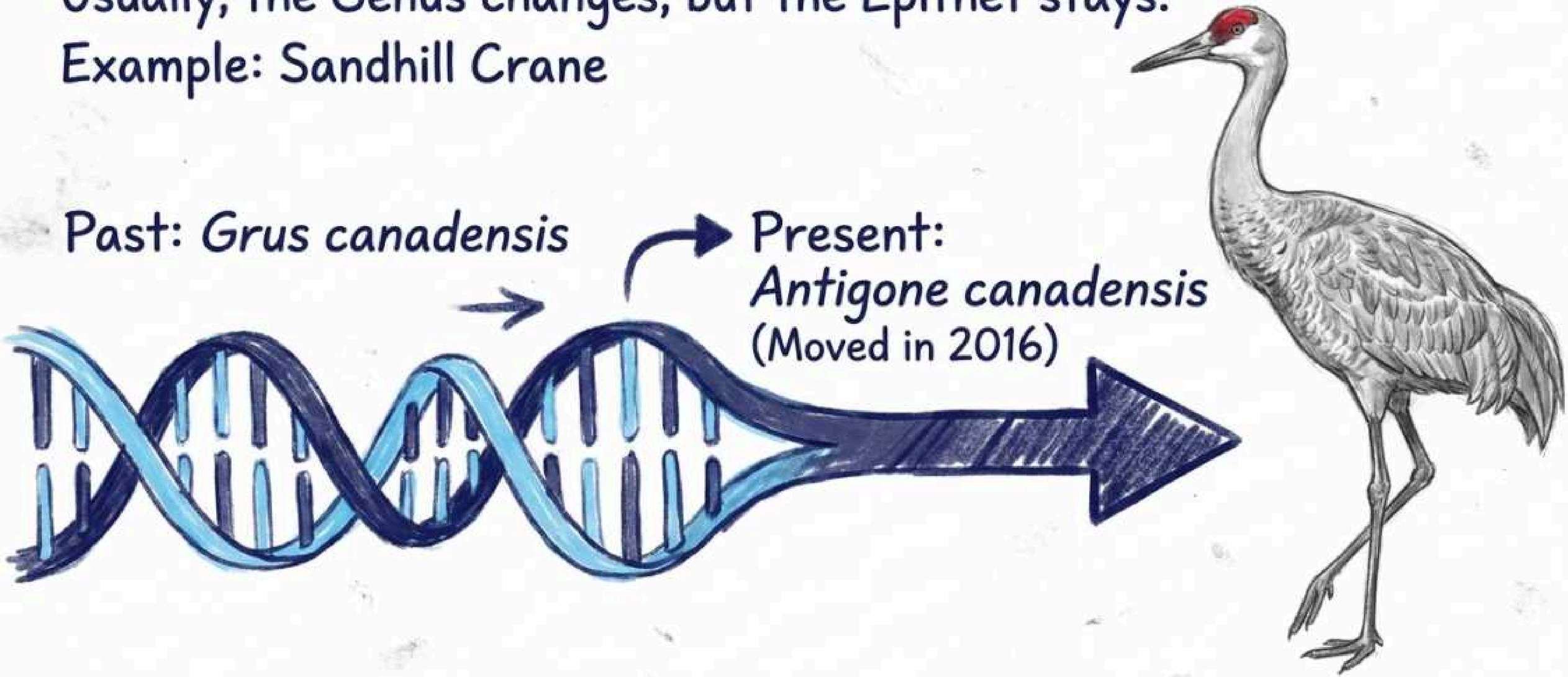
Why Names Change: Better Knowledge (DNA)

Usually, the Genus changes, but the Epithet stays.

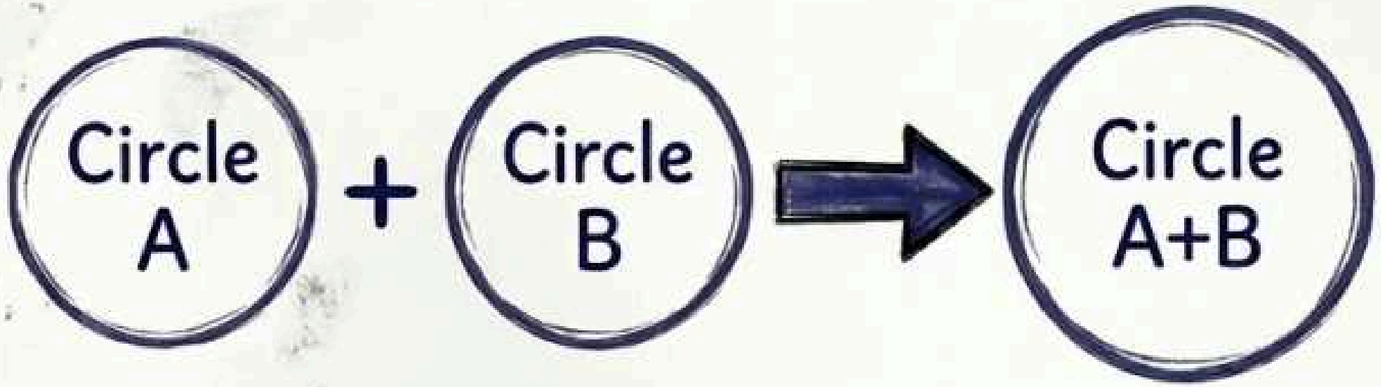
Example: Sandhill Crane

Past: *Grus canadensis*

Present:
Antigone canadensis
(Moved in 2016)

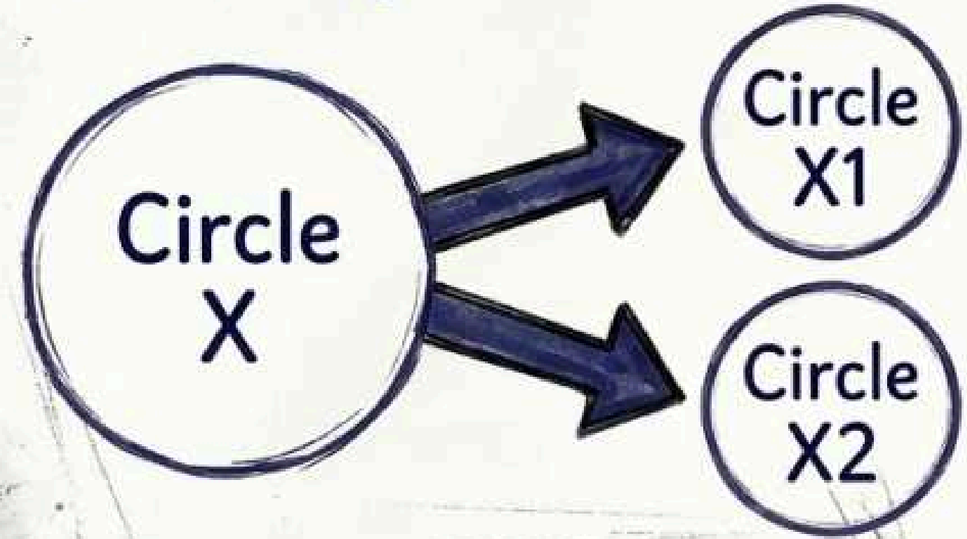


Lumping (2 becomes 1)



Northwestern crow →
lumped into American crow
(*Corvus brachyrhynchos*)

Splitting (1 becomes 2)



White-faced capuchin
split from South
American relative.

Now called *Cebus imitator*.



Your Nomenclature Toolkit:

- Roots to translate
- Pronunciation rules
- Ladder of ranks
- Codes & Types
- Understanding name changes

Note: Don’t panic if older books disagree! Always check databases like ITIS or GBIF.

Next Stop: The forests of Seattle!