

The background image is a painting depicting a large, multi-masted sailing ship on a wide river. In the foreground, a small boat with several people is visible, with one person standing and gesturing. The background features a range of mountains, including a prominent, snow-capped peak. The overall style is that of a 19th-century landscape painting.

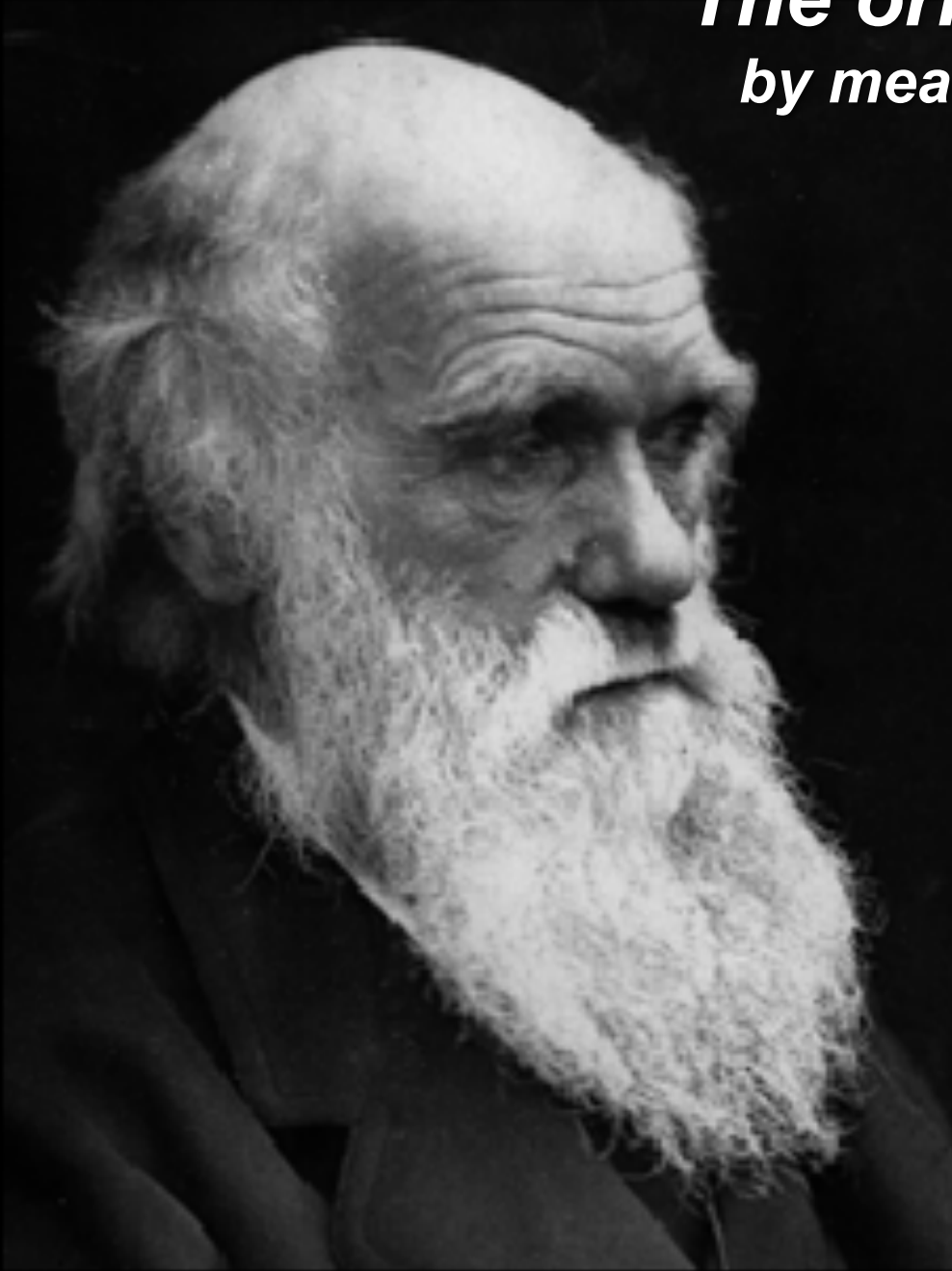
Darwin in Southern South America

Victor A. Ramos

Universidad de Buenos Aires

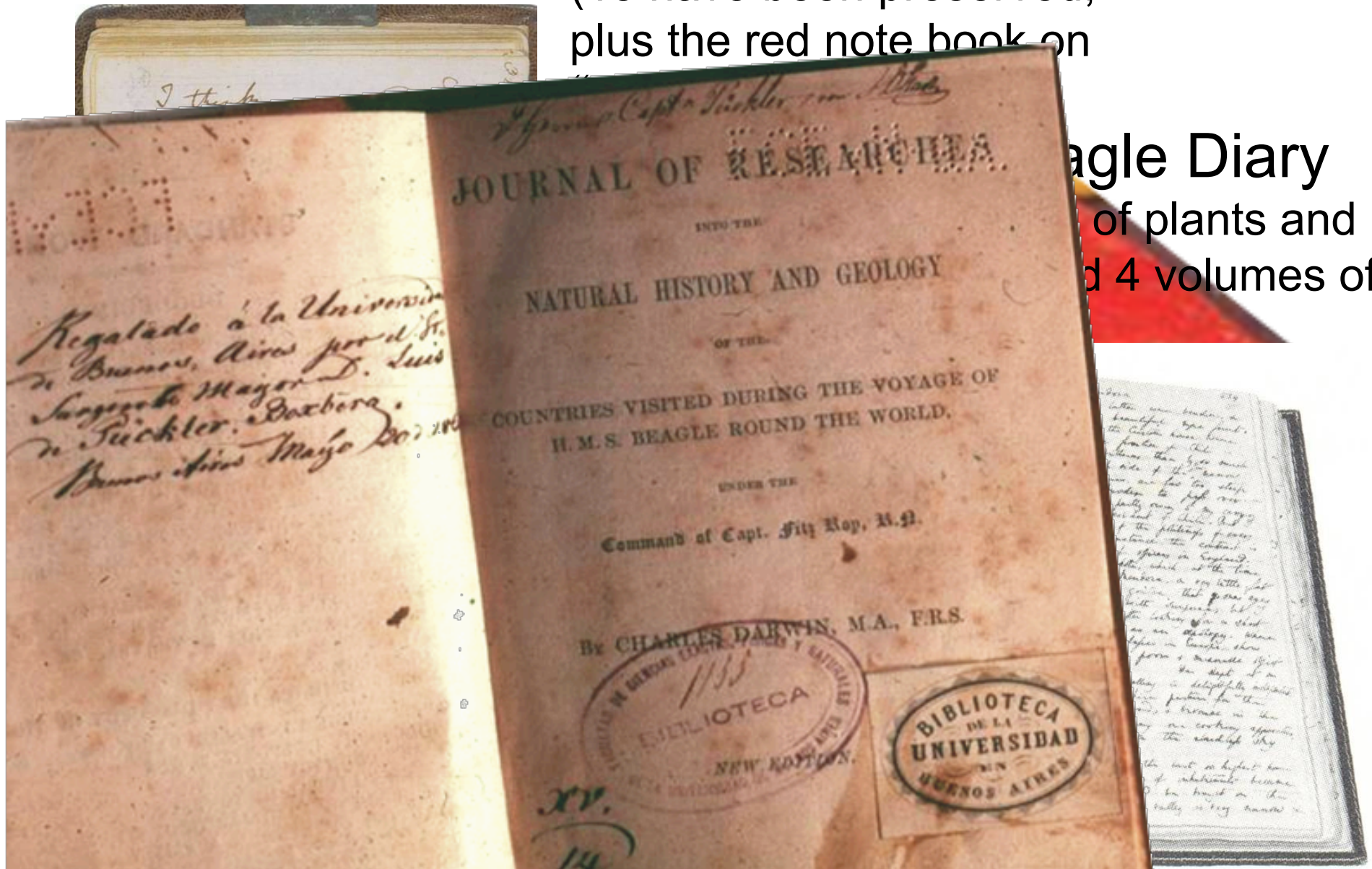
Conrad Martens' Beagle Pictures

***The origin of the species
by means of natural selection
1856***



His field note books
(18 have been preserved,
plus the red note book on

Beagle Diary
of plants and
4 volumes of





Galapagos Islands

Galápagos Islands

The map displays the Galápagos Islands, with major islands including Santa Cruz, Isabela, Santa Fe, San Cristobal, and San Sebastian. Key geographical features and locations marked include:

- Islands:** Santa Cruz Island, Isabela Island, Santa Fe Island, San Cristobal Island, San Sebastian Island, Santa Cruz Island, Isabela Island, Santa Fe Island, San Cristobal Island, San Sebastian Island.
- Geographical Features:** Wolf Volcano, Volcan Ecuador, Darwin Volcano, Alcedo Volcano, Sierra Negra, Cerro Azul, Roca Union, Tortuga Island, Crossman Islands, Roca Redonda, Marchena Island, Pinta Island, Roca Redonda, Marchena Island, Pinta Island.
- Locations:** Cape Berkeley, Punta Vicente Roca, Cape Douglas, Punta Espinosa, Cape Hammond, Punta Mangle, Mariela Islets, Elizabeth Bay, Punta Moreno, Caleta Webb, Punta Essex, Caleta Iguana, Puerto Villamil, Tortuga Bay, Puerto Ayora, Academy Bay, Gordon Rocks, Plazas Is, Baltra Island, Seymour I, Mosquera I, Daphne Is, Sombbrero Chino, Bainbridge Rocks, Bartolome I, Sullivan Bay, James Bay, Buccaneer Cove, Rabida I, Pinzon I, Nameless I, Eden I, Santa Cruz Island, Santa Fe Island, San Cristobal Island, San Sebastian Island, Santa Cruz Island, Isabela Island, Santa Fe Island, San Cristobal Island, San Sebastian Island.

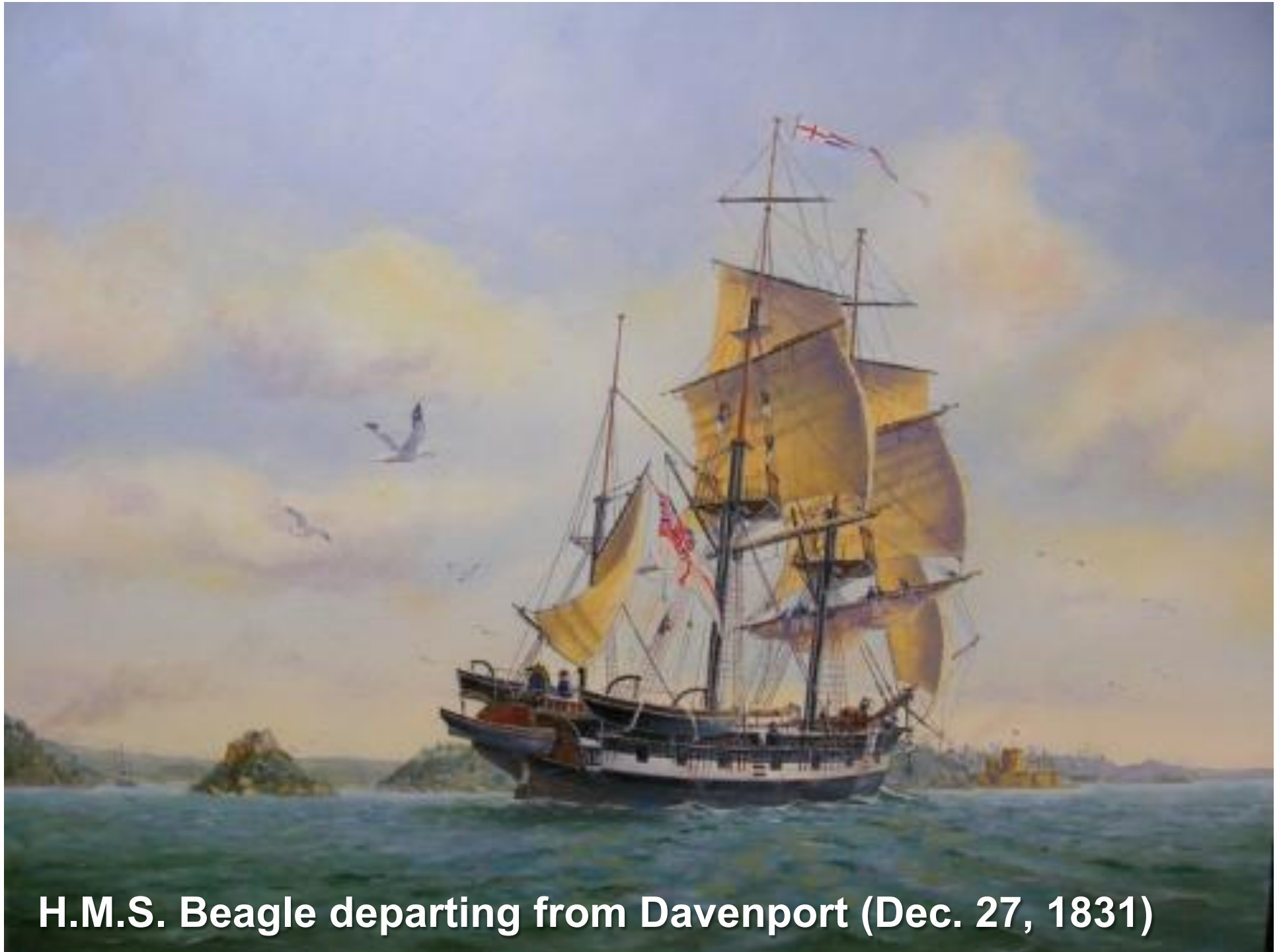
Speciation of the finches in the different islands based on the available food: Fruit, insect, seed and cactus eaters

Speciation of the finches in the different islands
based on the available food:
Fruit, insect, seed and cactus eaters

Finch specimens collected
in the Galápagos Islands by
the Beagle expedition.



3 of the 4 specimens
of mockingbirds collected
by Darwin in the
Galápagos Islands



H.M.S. Beagle departing from Davenport (Dec. 27, 1831)

Charles Darwin:

- A 22 years old clergyman that accompanied Captain Fitz Roy's expedition of the Beagle around the world during more than five years.
- They surveyed the coast of southern South America for more than 3 and half years (March 1832 to October 1835).



Main Darwin's Observations

Valparaíso

Valdivia
Earthquake

Osorno Volcano

Chiloé Island



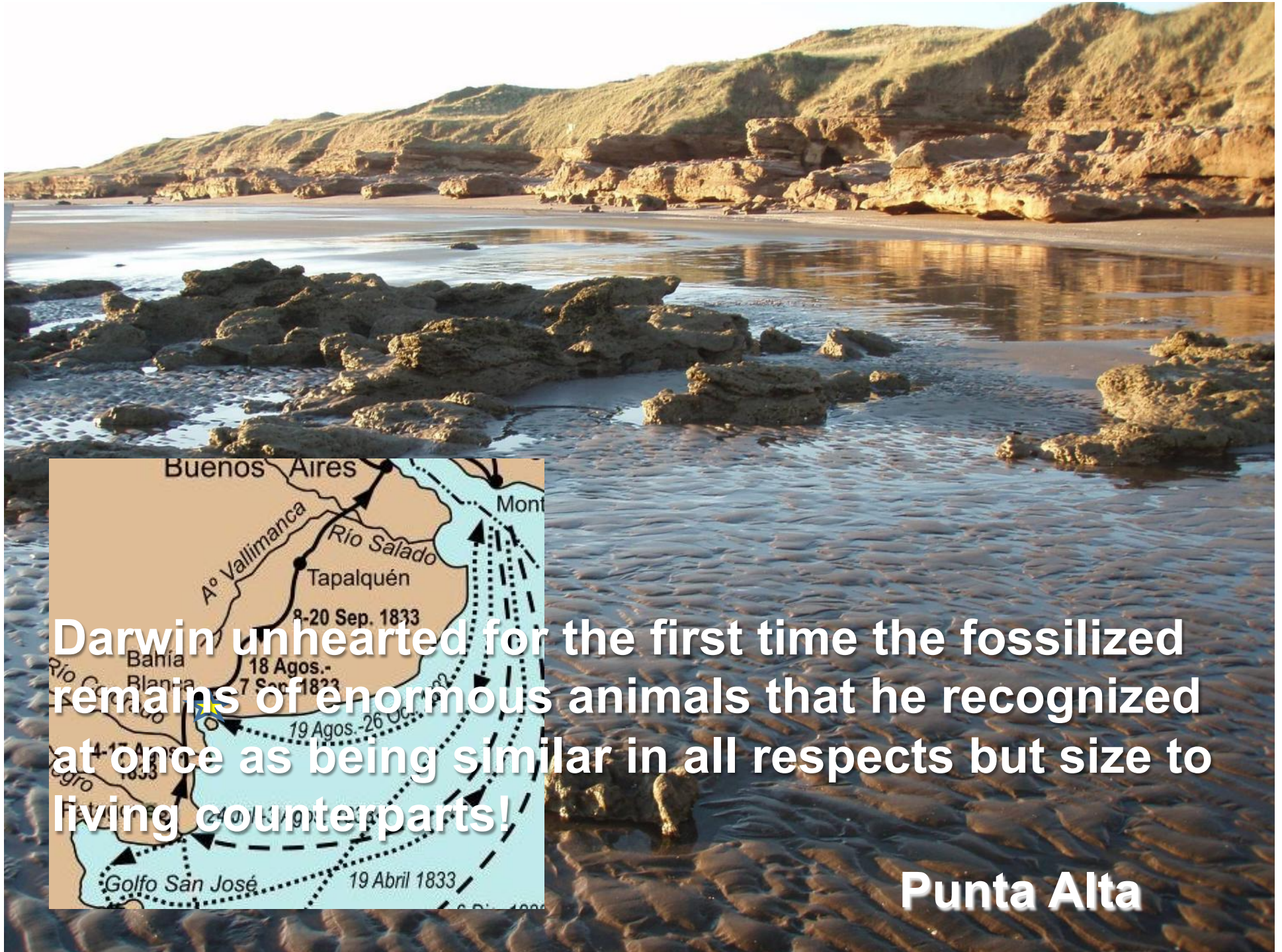
Punta Alta

Port Desire

Port San Julián

Port Santa Cruz

Malvinas/Falkland
Islands



Darwin unheated for the first time the fossilized remains of enormous animals that he recognized at once as being similar in all respects but size to living counterparts!

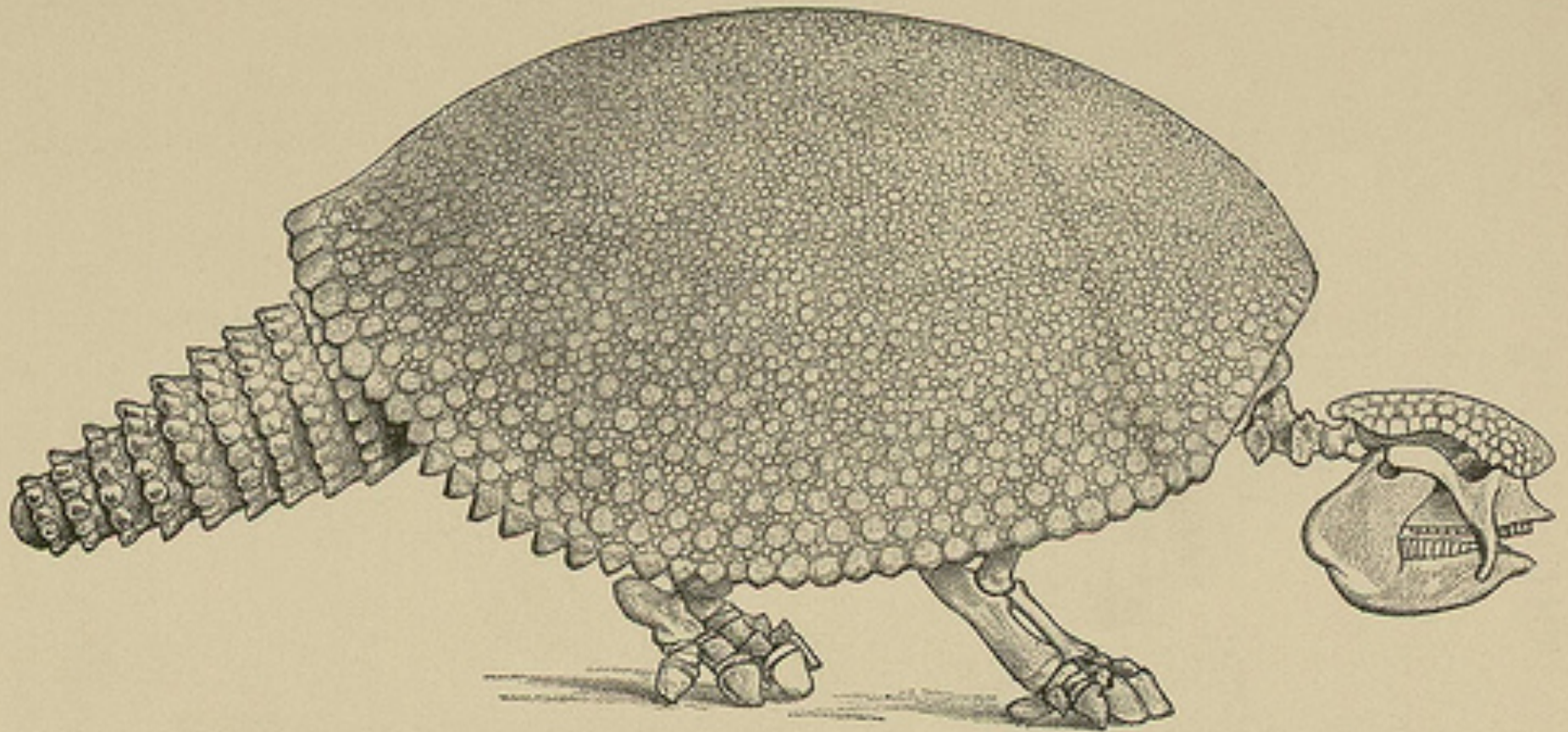
Punta Alta

The temporal replacement of species



Glyptodon

The temporal replacement of species



Glyptodon



Living armadillo

Dasypus hybridus ~ 0.5 m

$> 2 \text{ m}$

Glyptodon



$< 0.5 \text{ m}$

Living armadillo



THE TEMPORAL REPLACEMENT OF SPECIES

For Darwin, this fact
was difficult to understand in
the light of the Catastrophic
theory of Cuvier.

It was much easy to
explain if the modern or recent
species were descendent or at
least shared a common
ancestor with the fossil ones.



Port Desire 1833



Port Desire 2013

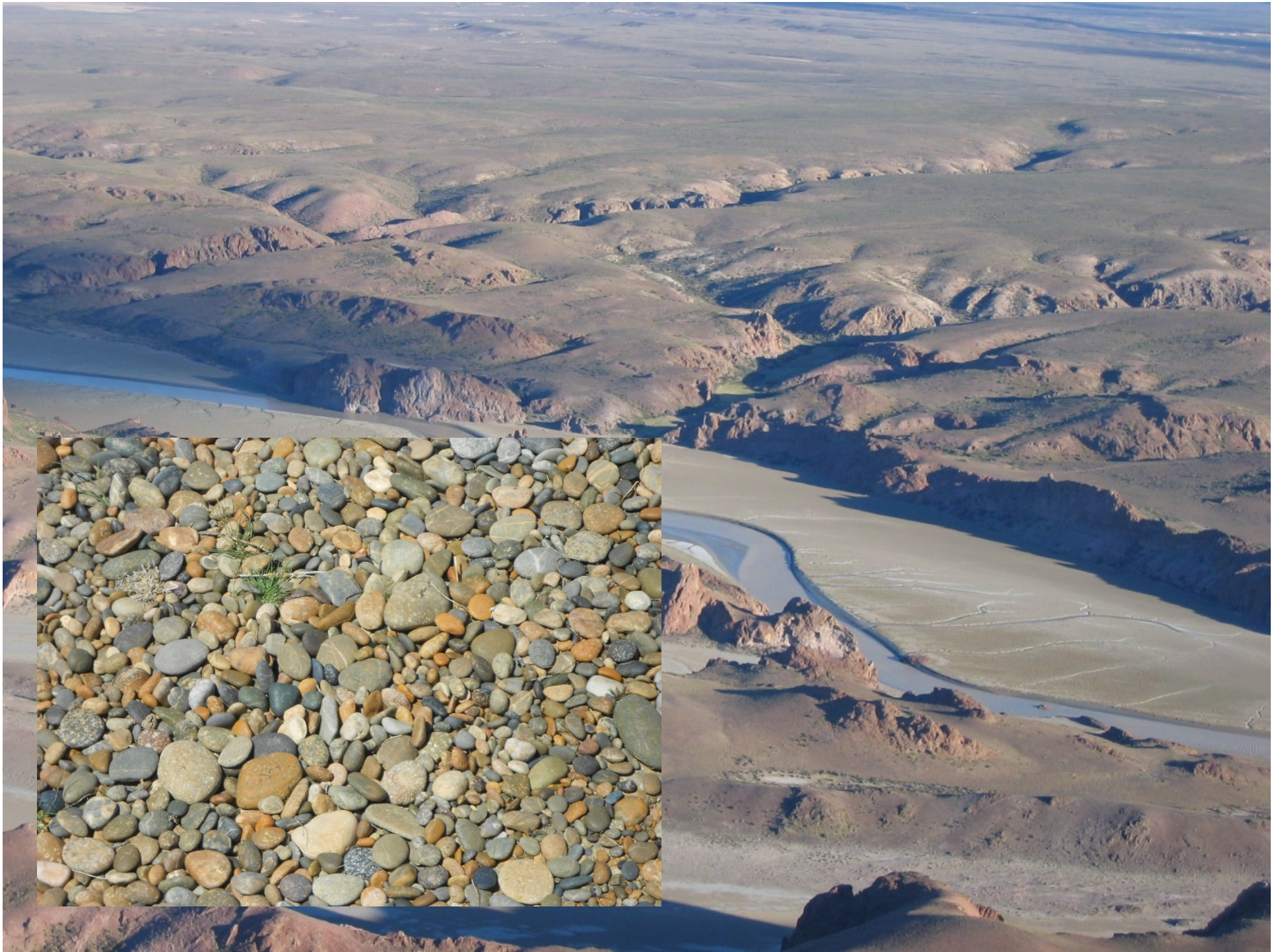


the course of the river - looking down
21 miles from the mouth



1830
Davis fecit





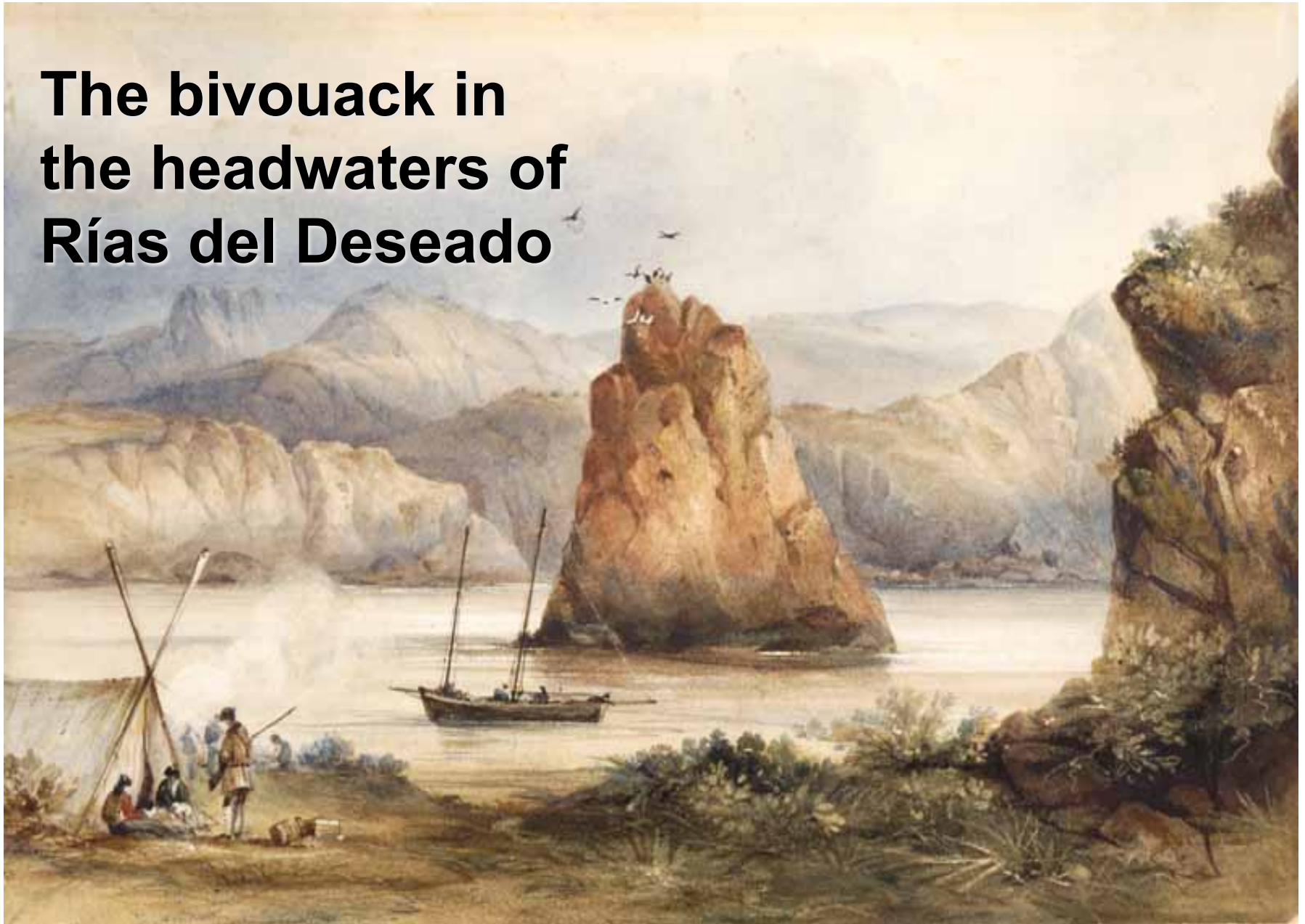
“Mirador de Darwin”



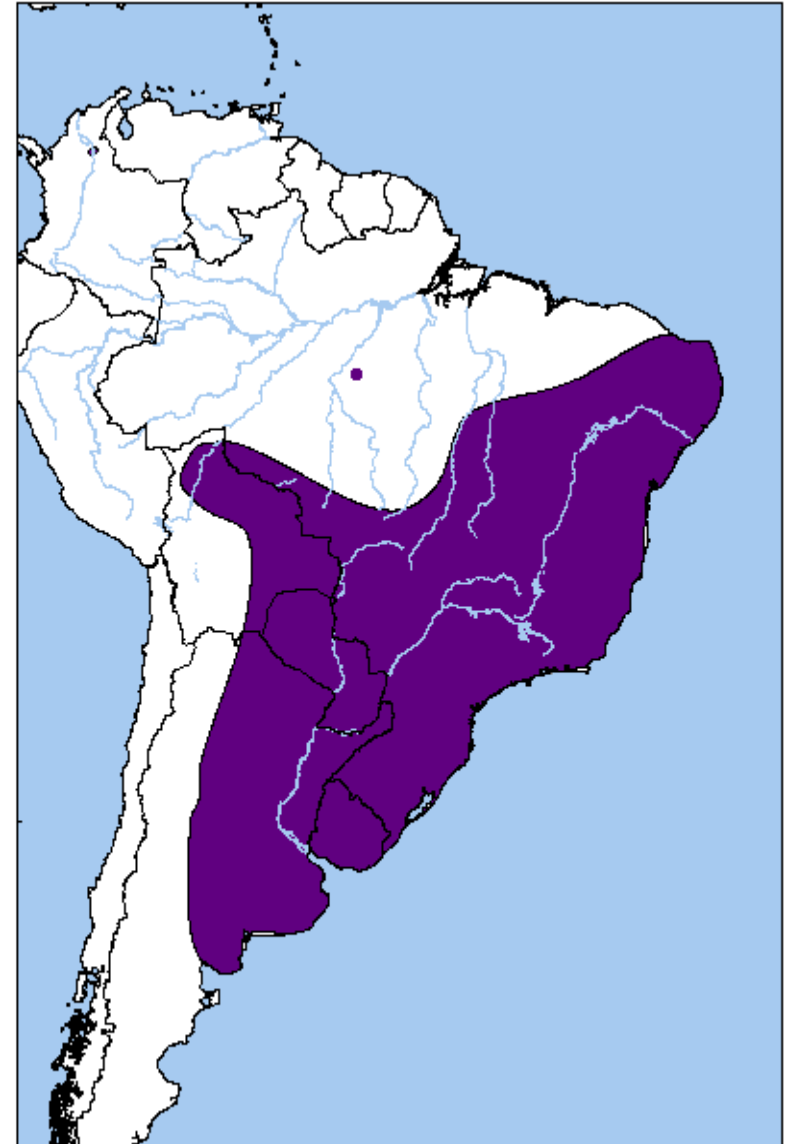
... “All is stillness and desolation. One reflects how many centuries it has thus been and how many more it will thus remain” ...

(Beagle Diary, Dec. 28th. 1833)

The bivouack in the headwaters of Rías del Deseado

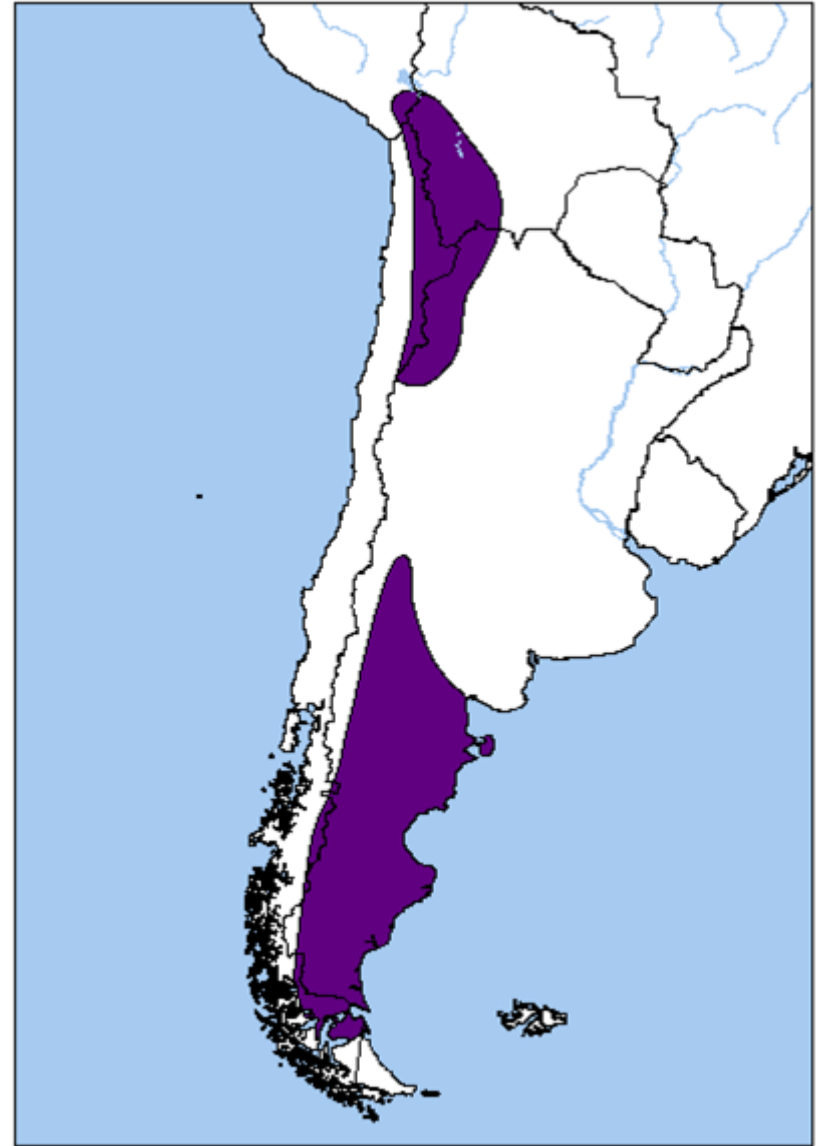


THE GEOGRAPHIC REPLACEMENT OF SPECIES



Greater Ñandú (*Rhea americana*)

THE GEOGRAPHIC REPLACEMENT OF SPECIES



Lesser Ñandú (*Pterocnemia pennata*)

THE GEOGRAPHIC REPLACEMENT OF SPECIES

The rheas became the example of geographic replacement of closely allied species as Darwin approached, and eventually completely embraced, the transmutationist hypothesis



Port San Julián





Nao Victoria

Bahía San Julián

Disappointment Point (Magallanes, 1520)



Bahía San Julián

Beagle Bay (Stokes, 1828)



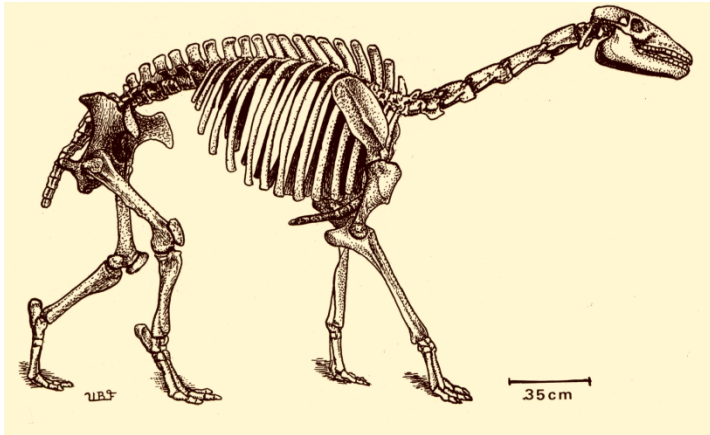
Liutenant R.H. Scholl

Bahía San Julián

Giant oyster bed



Giant mammal remains

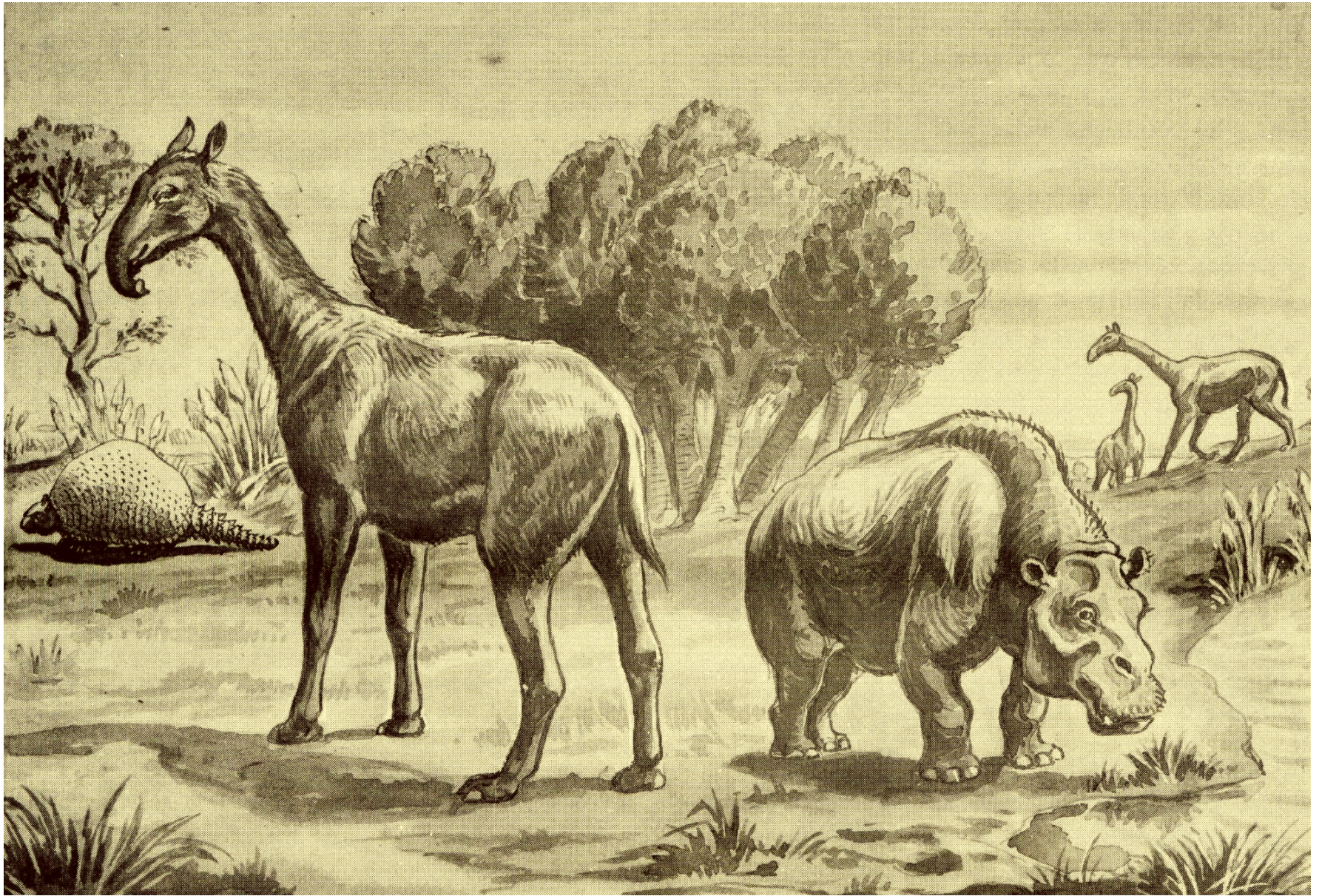


Giant oyster bed



Bahía San Julián



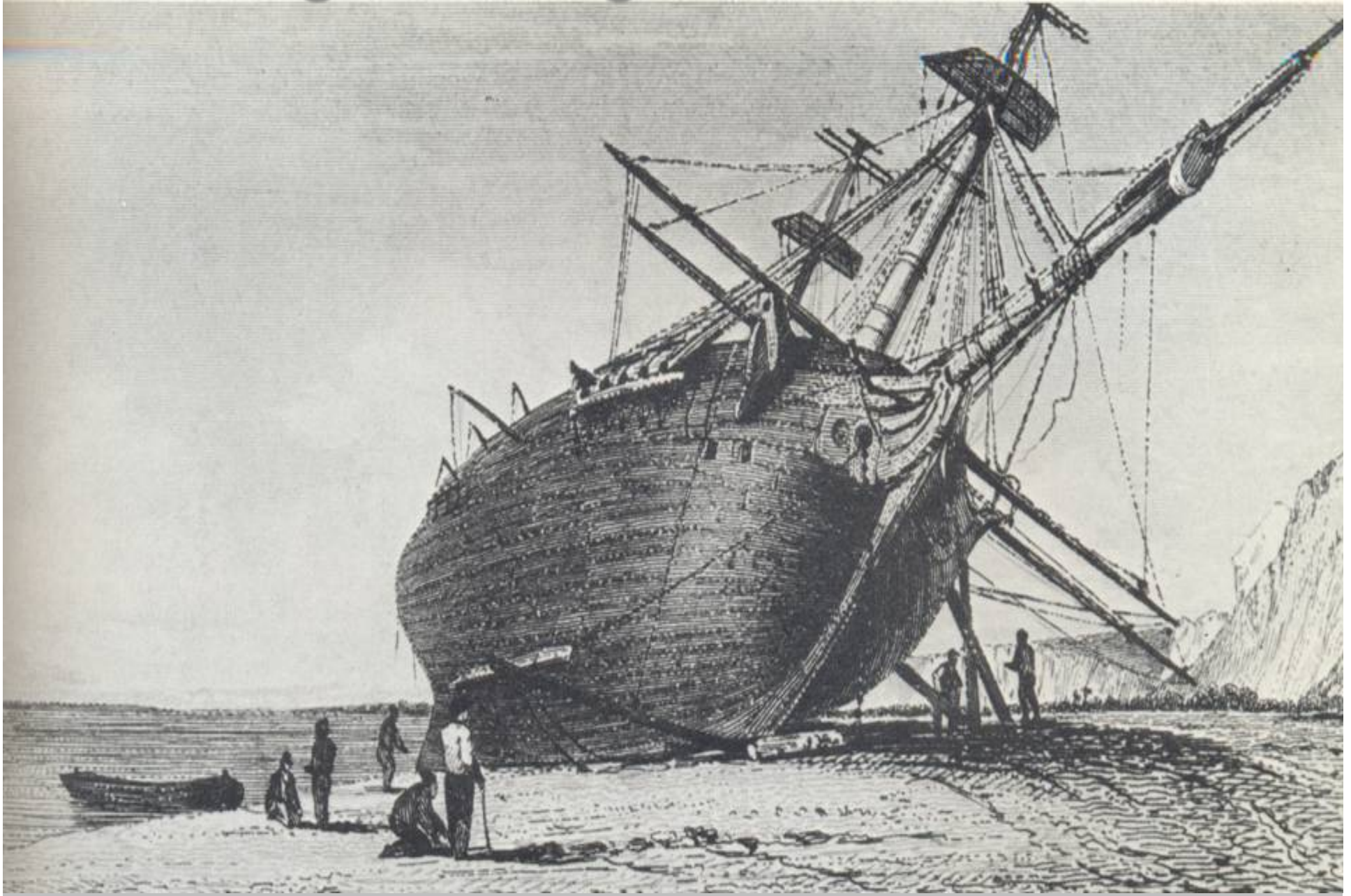


Machrauchenia: a South American giant horse ancestor

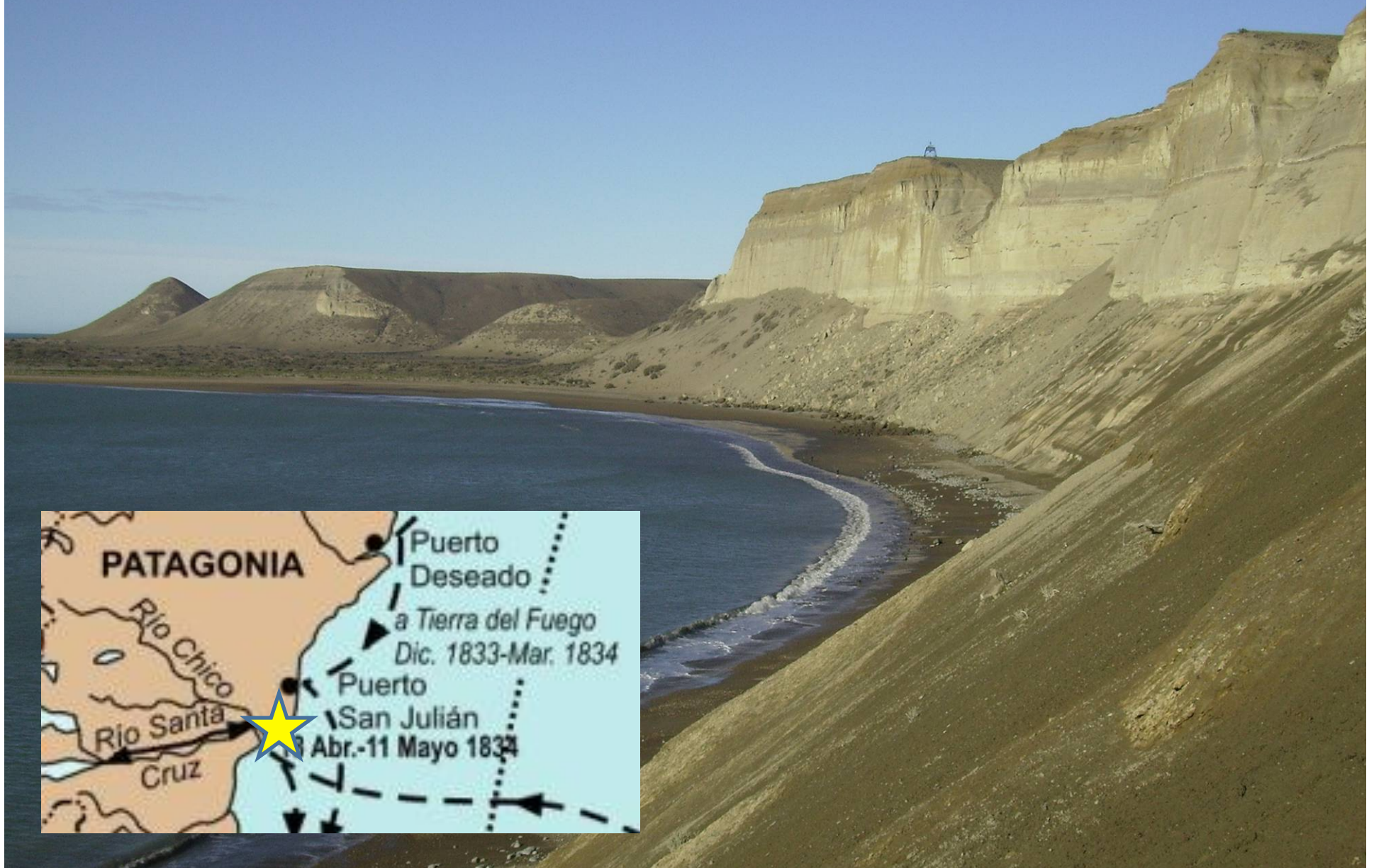
Port Santa Cruz

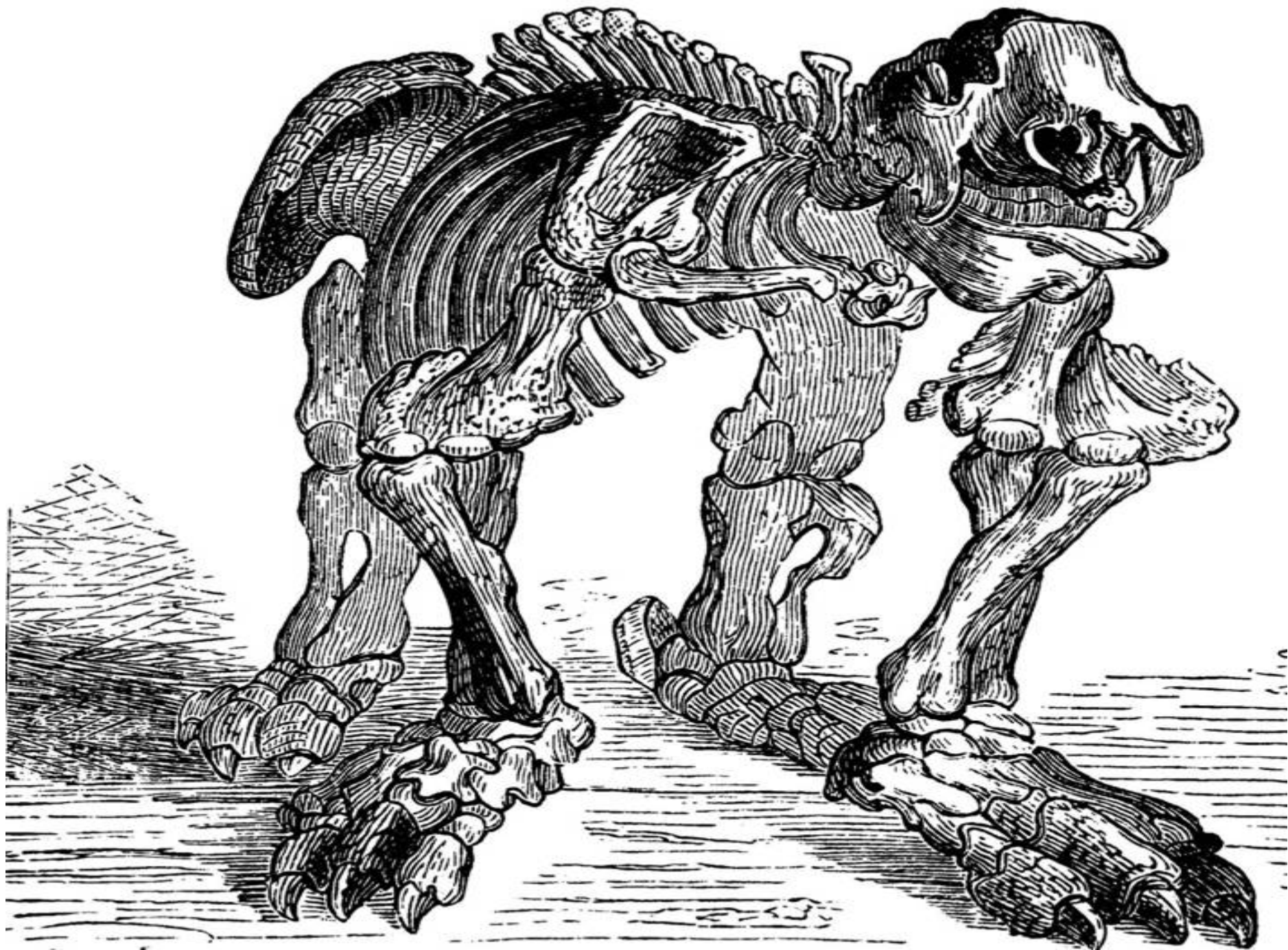


Caulking the Beagle



Darwin's sections along the cliffs south of Santa Cruz River





Darwin and the Universal Deluge

The erratic boulders of Cwm Idwal in northern Wales



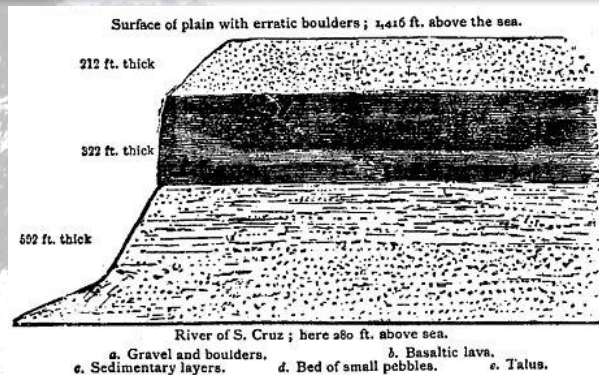
In Cwm Idwal are large blocks of exotic composition which had an enigmatic origin and people attributed them to the Universal Deluge (similar blocks were known in northern Europe hundred of kilometers from the Alpine front). Darwin has visited this area with Sedgwick.

Darwin and the Universal Deluge



A few years later Darwin saw similar erratic blocks along the Río Santa Cruz valley, when they try to reach the headwaters of this river.

(April of 1834)



At that time Darwin could not find a logic explanation for the origin of these exotic blocks.



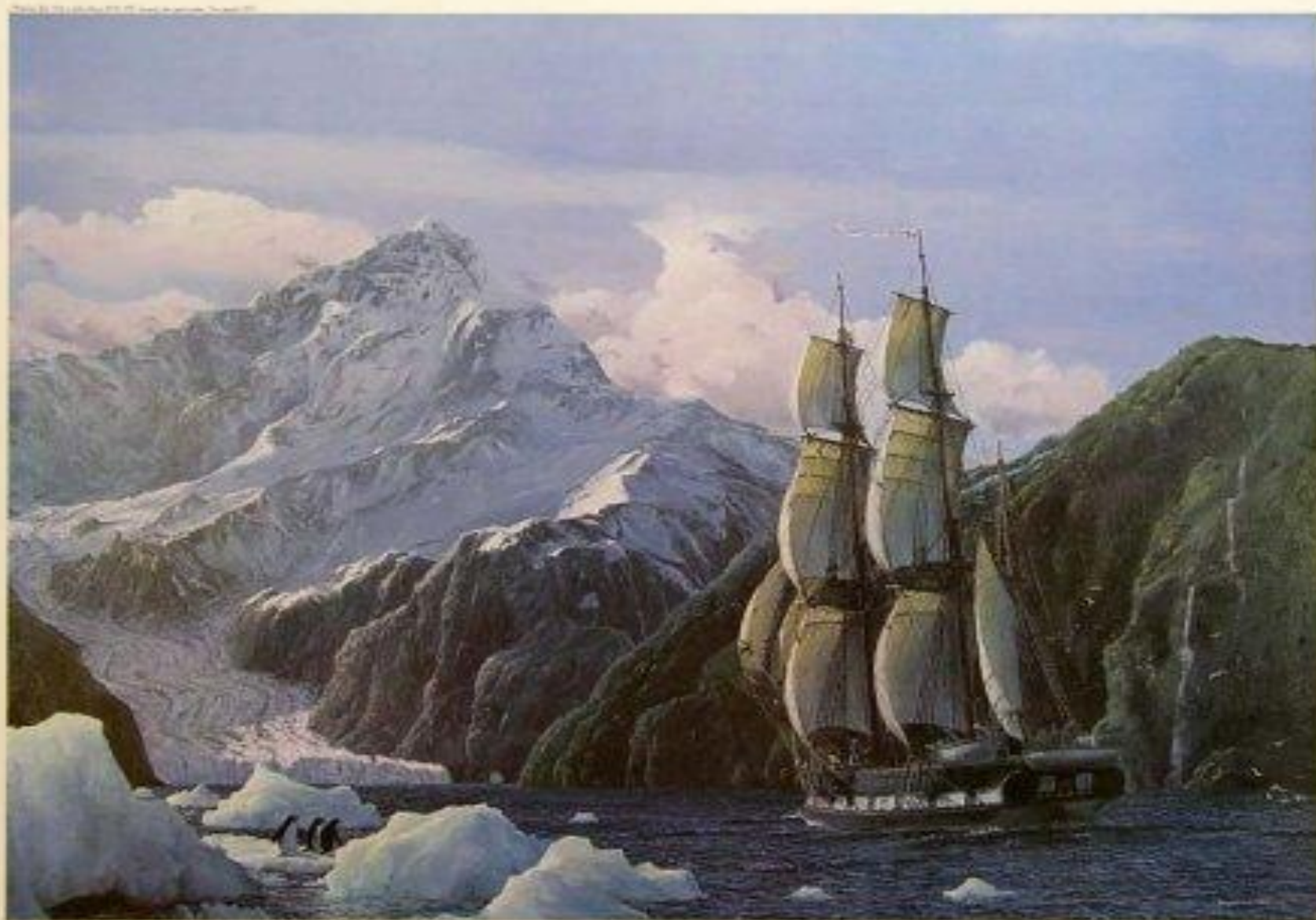
View of the Patagonian Andes from the headwaters of Río Santa Cruz Valley.



CORDILLERA OF THE ANDES



The Beagle in Magellan Strait



Charles Darwin with the Beagle and the Albatrosses, during the voyage of the Beagle and the Albatross.

Raymond A. Massey

H.M.S. BEAGLE 1832
Raymond A. Massey



The Beagle in Magellan Strait

Darwin and the Universal Deluge



Back in England organized a new visit to Wales to re-examine the erratic boulders of Cwm Idwal in June of 1842 (His last geological fieldtrip).

As a result of this expedition Darwin proposed the glacial origin of the erratic blocks of Cwm Idwal and interpreted all the landscape as formed by glaciers and disregard the Universal Deluge as a cause of these facts, agreeing with the Glacial Theory of Agassiz (1840).



[180]

XXX. *Notes on the Effects produced by the Ancient Glaciers of Caernarvonshire, and on the Boulders transported by Floating Ice.* By CHARLES DARWIN, Esq., M.A., F.R.S. and F.G.S.

GUIDED and taught by the abstract of Dr. Buckland's memoir "On Diluvio-Glacial Phænomena in Snowdonia

Edinburgh New Philosophical Journal (1842)



The Malvinas/Falkland Islands



The Gentoo penguin colony



Bluff Cove outcrops



Carboniferous quartzites



Carboniferous quartzites



Tightly folded quartzites



The Malvinas Fox †

Main Darwin's Observations

Valparaíso

Valdivia Earthquake

Osorno Volcano

Chiloé Island



Punta Alta

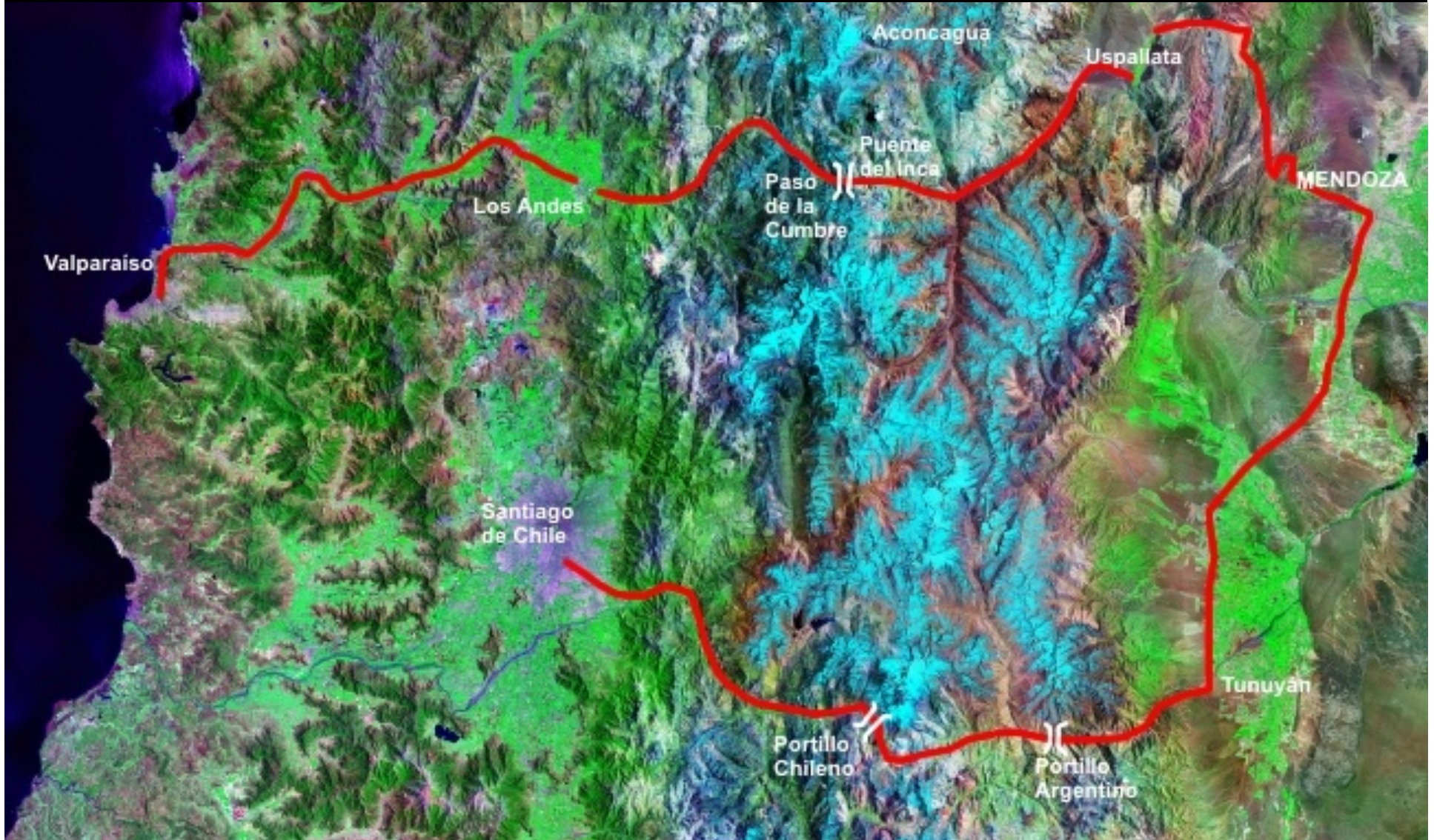
Port Desire

Port San Julián

Port Santa Cruz

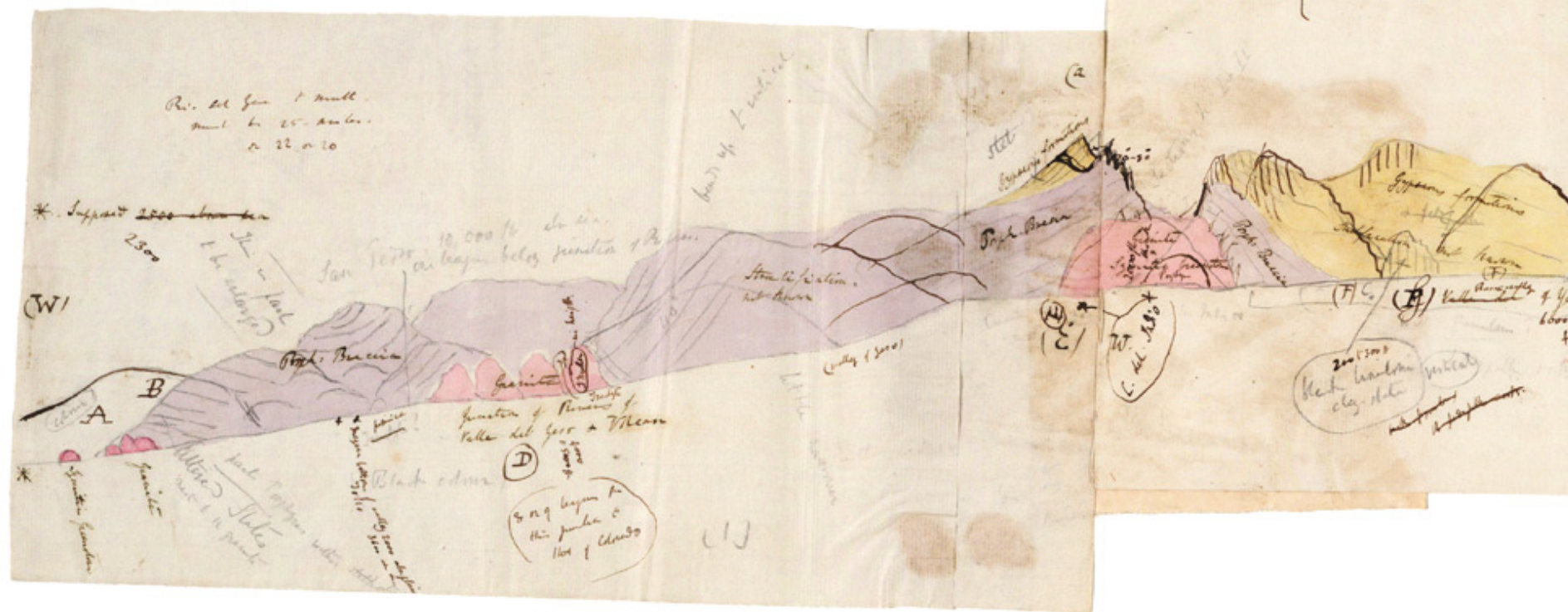
Malvinas/Falkland Islands

DARWIN'S EXPEDITION ACROSS THE HIGH ANDES



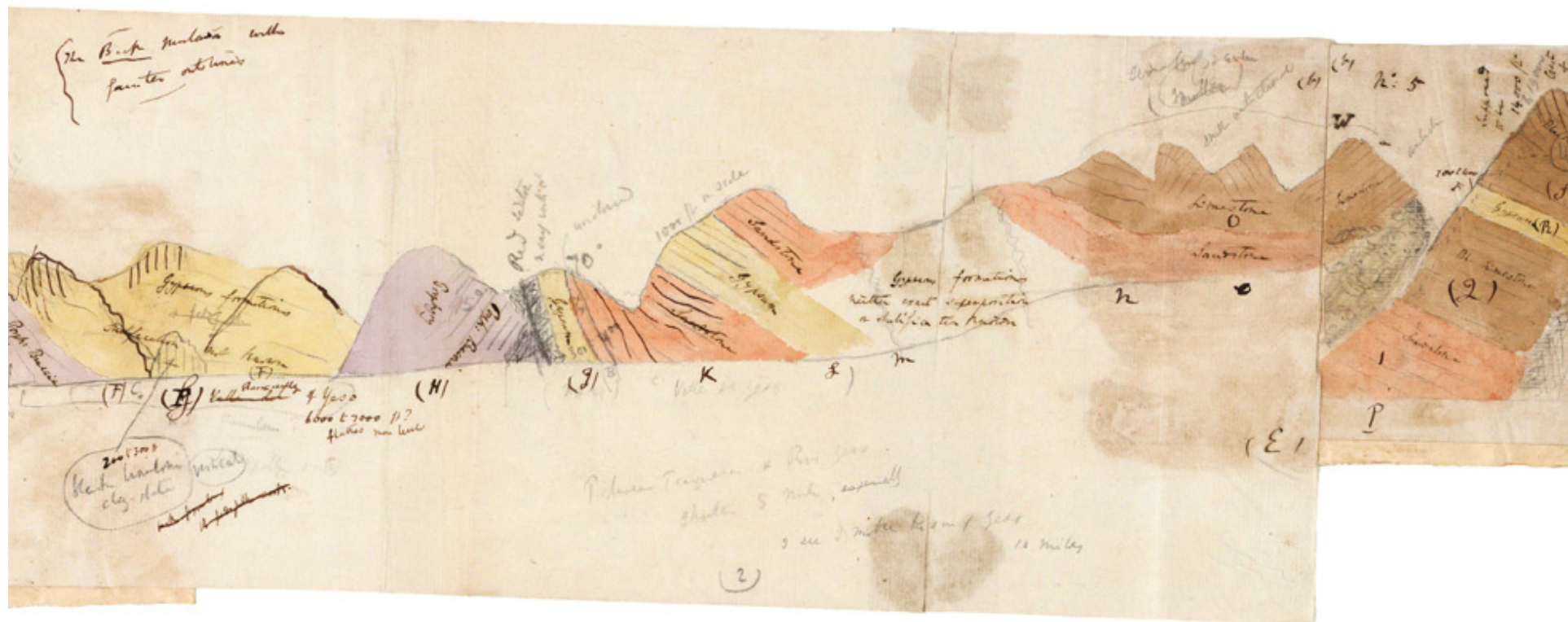


" Darwin's shelter of Paramillo "

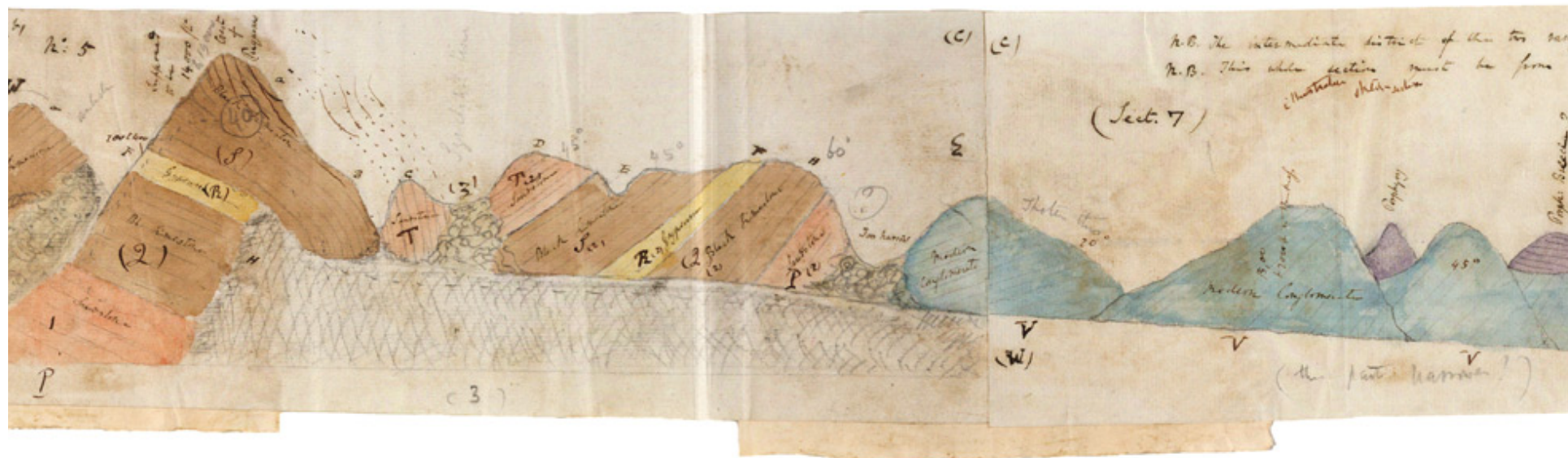


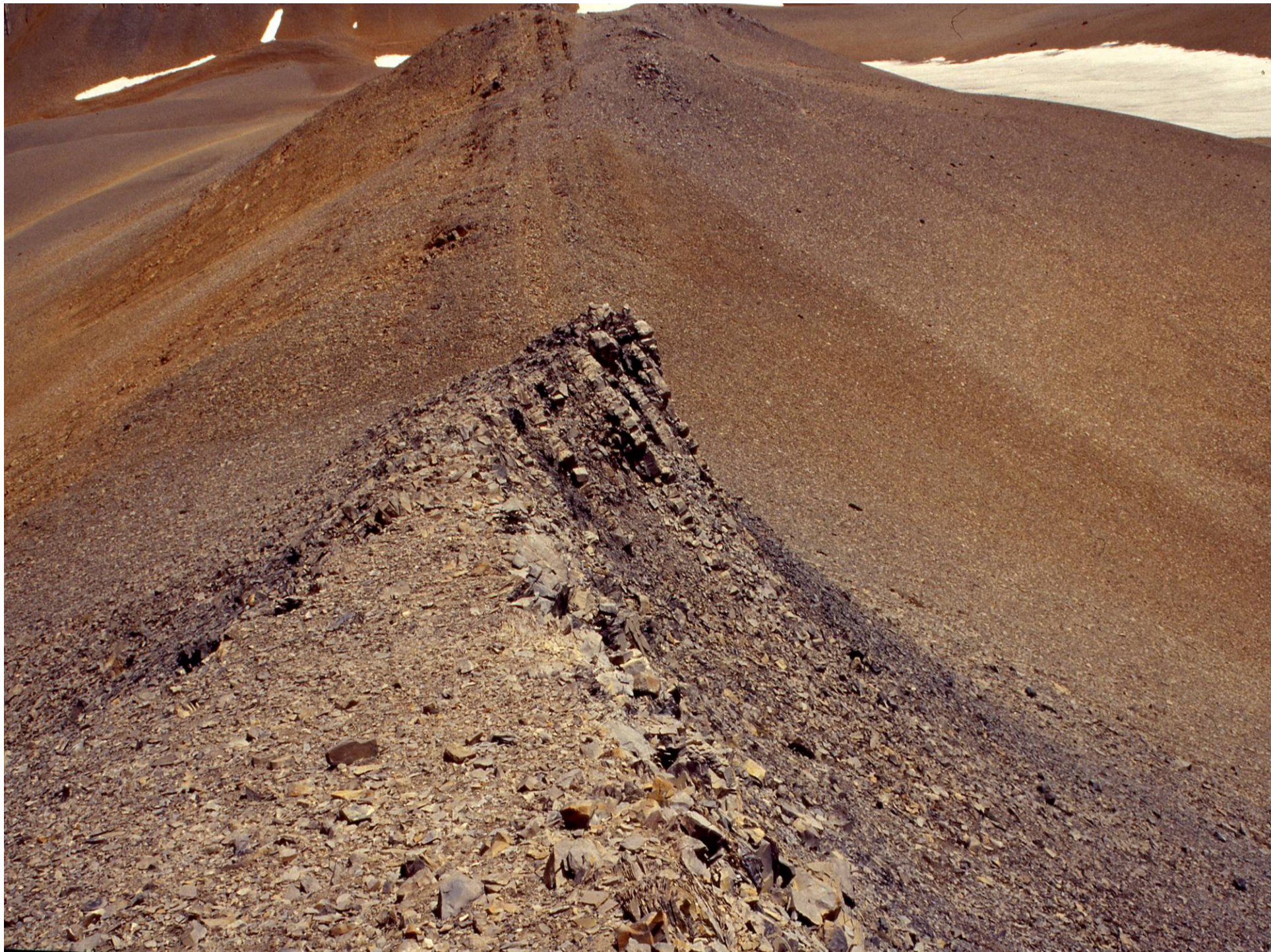


" Darwin's shelter of Las Vacas"





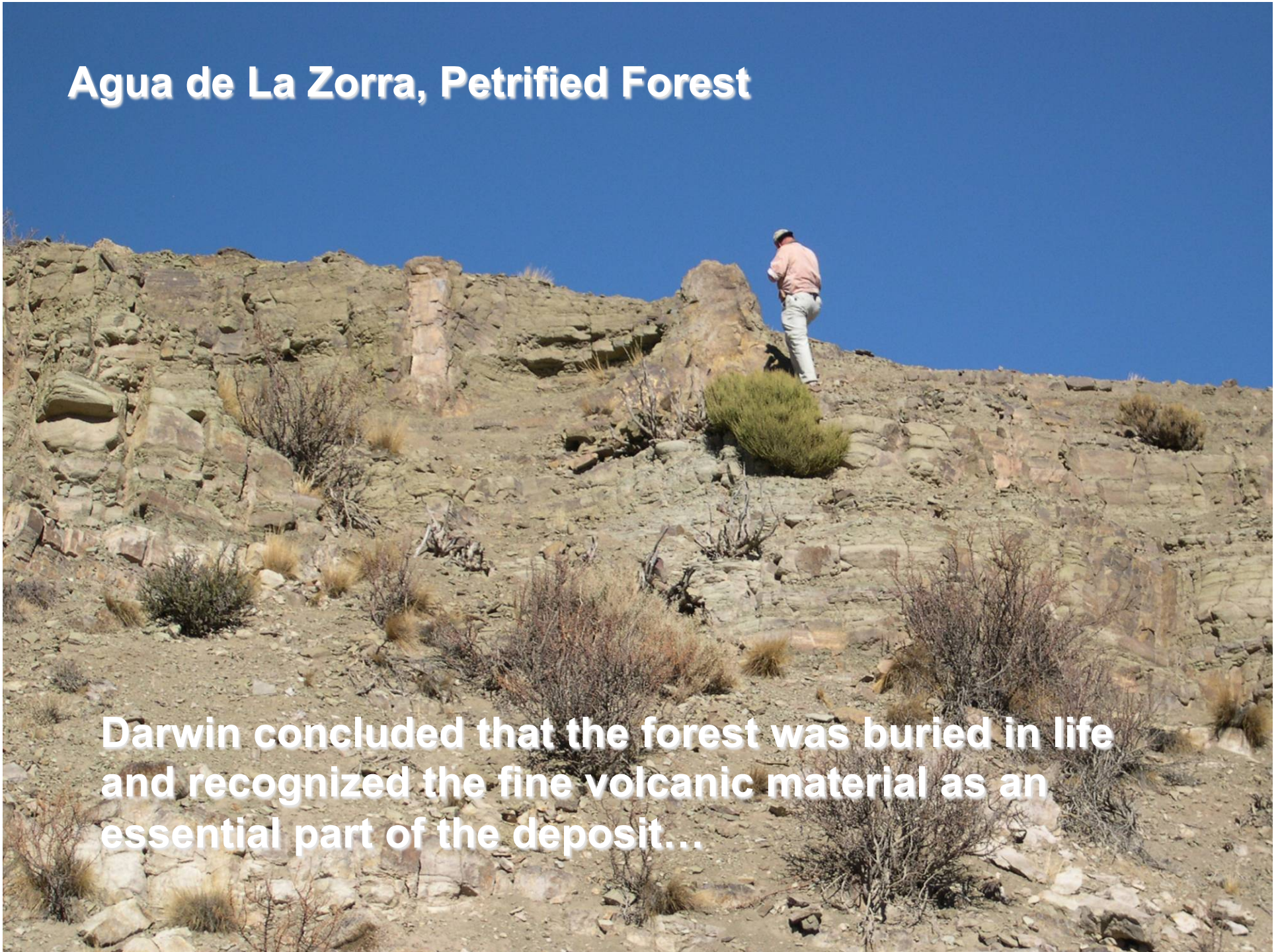


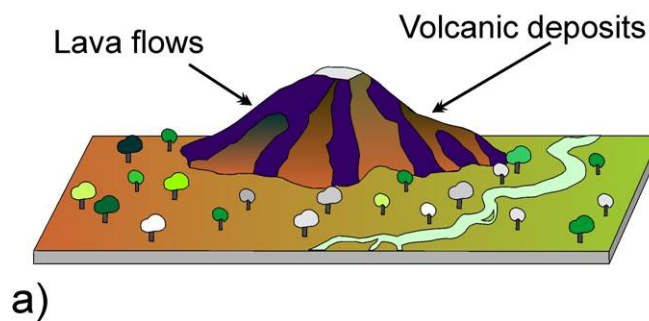
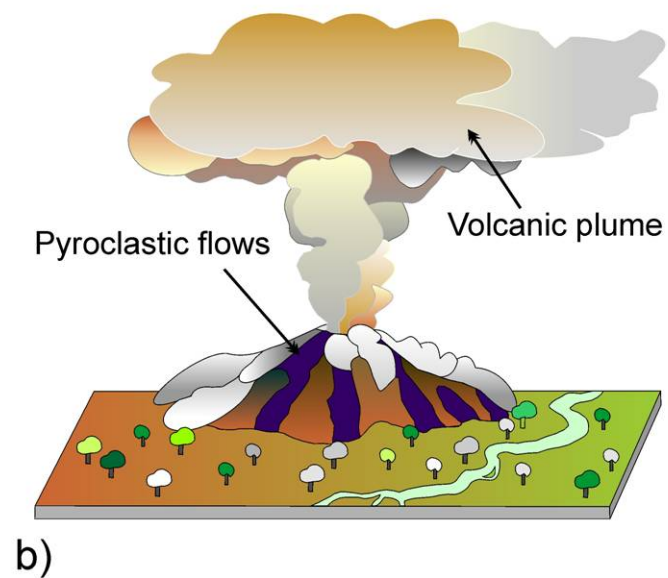
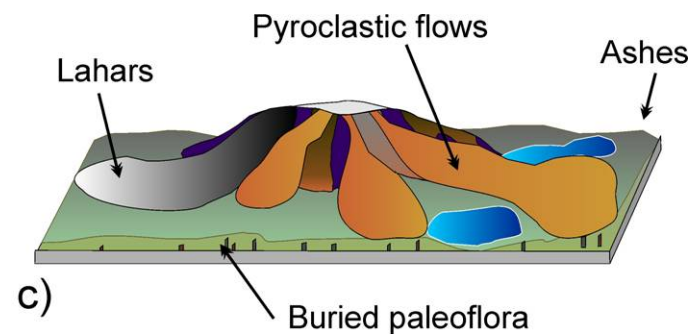
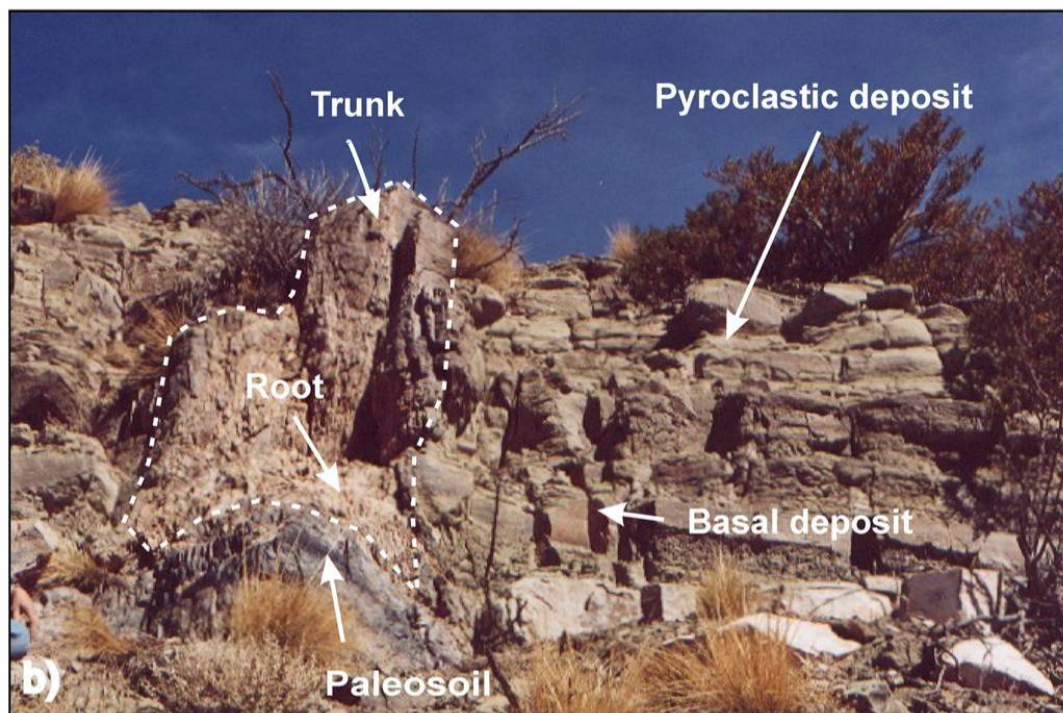
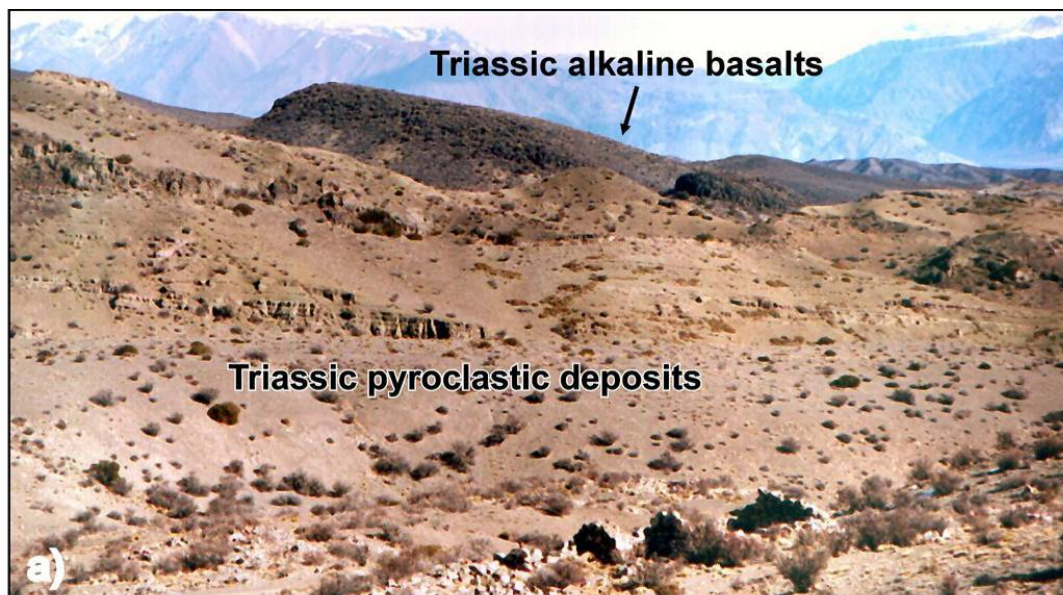




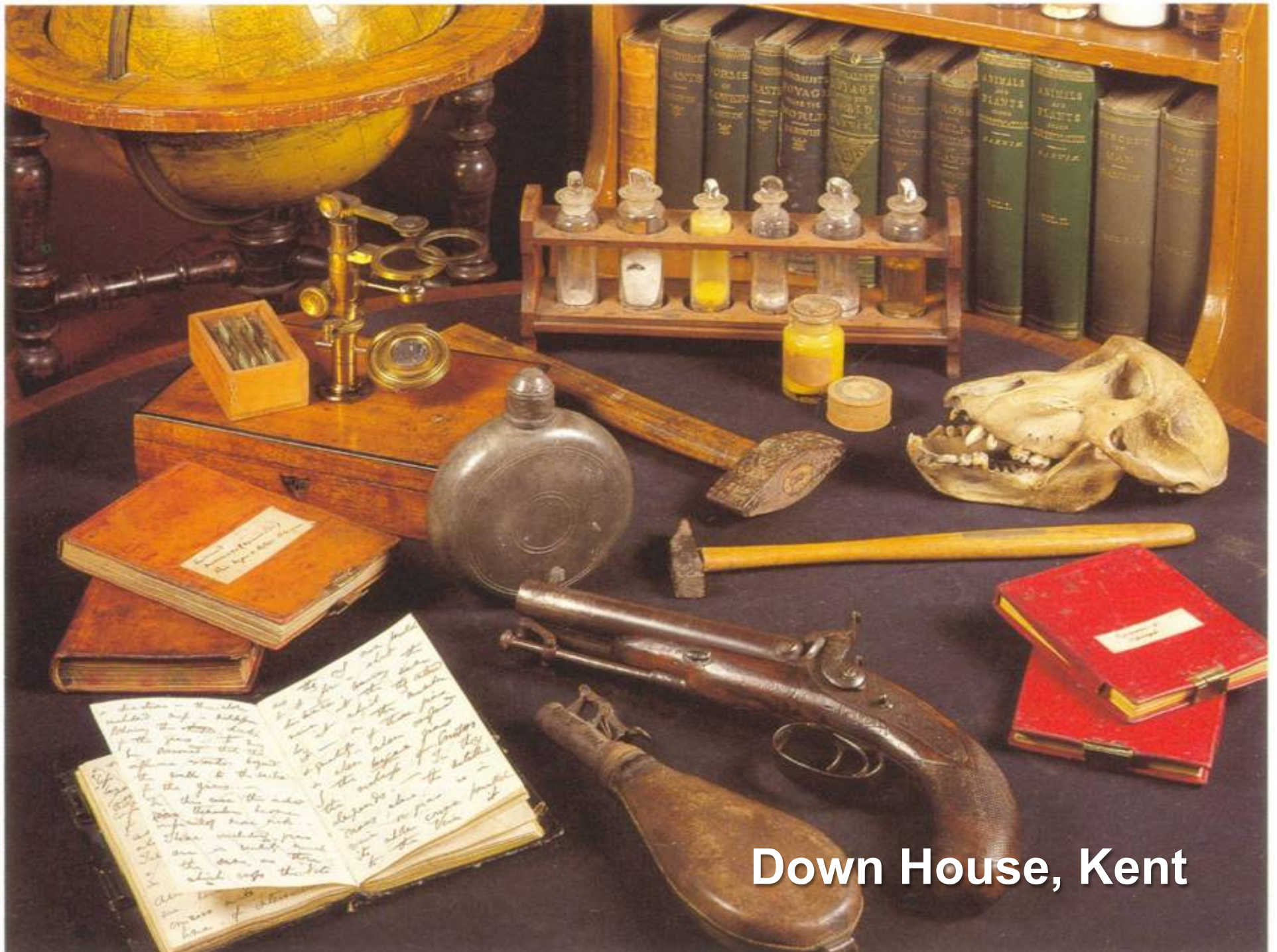
Agua de La Zorra, Petrified Forest

Darwin concluded that the forest was buried in life and recognized the fine volcanic material as an essential part of the deposit...

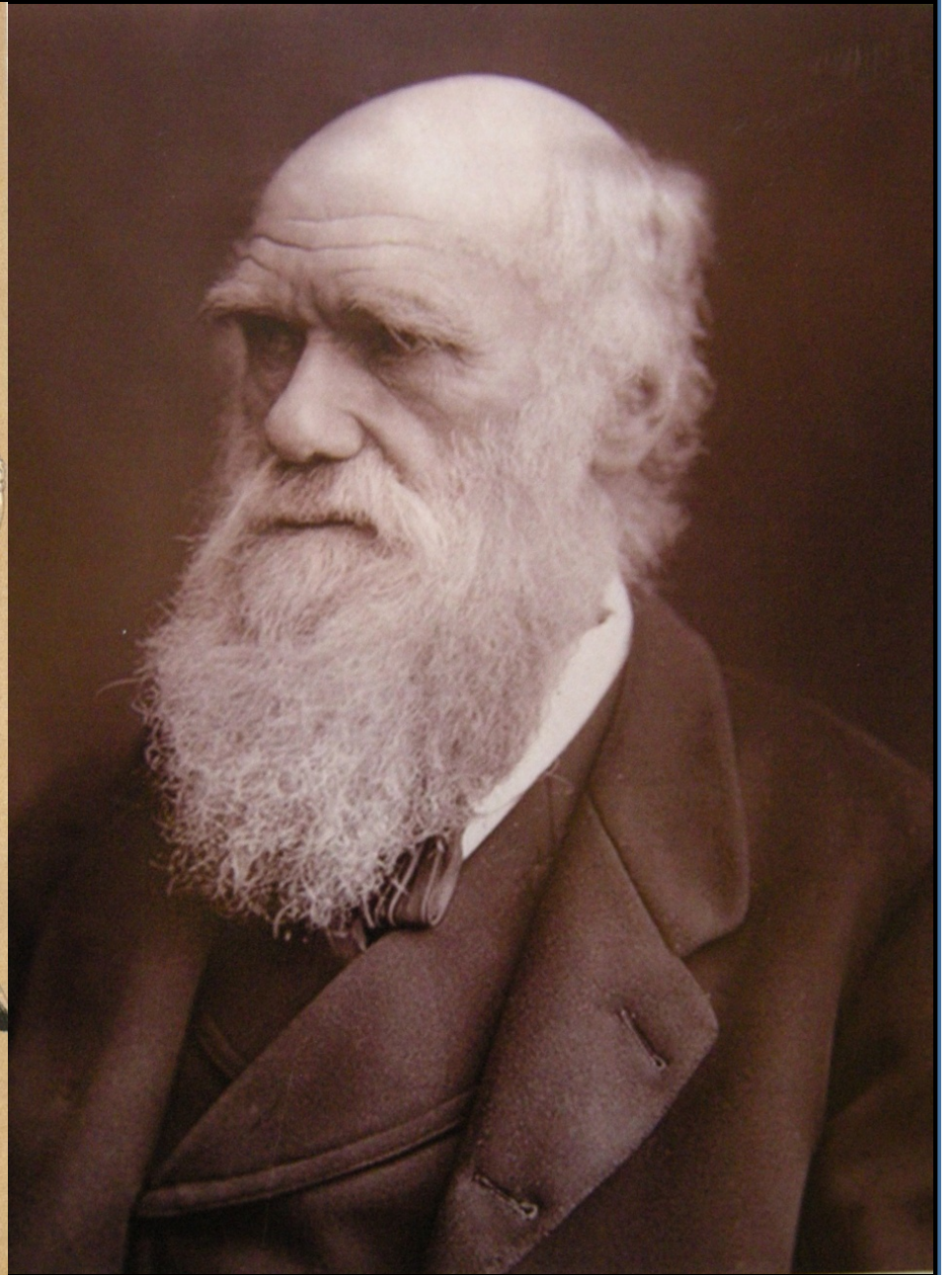


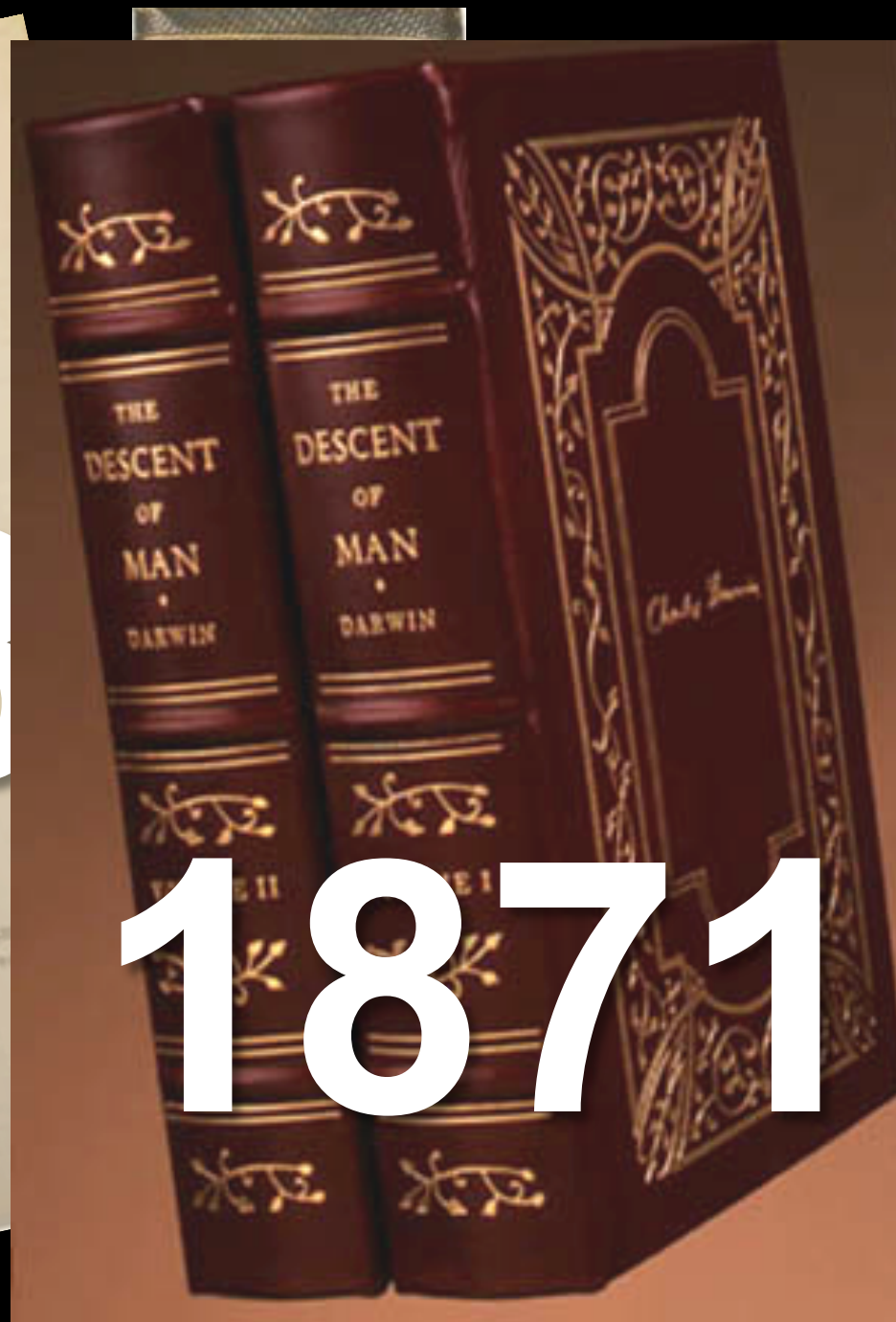
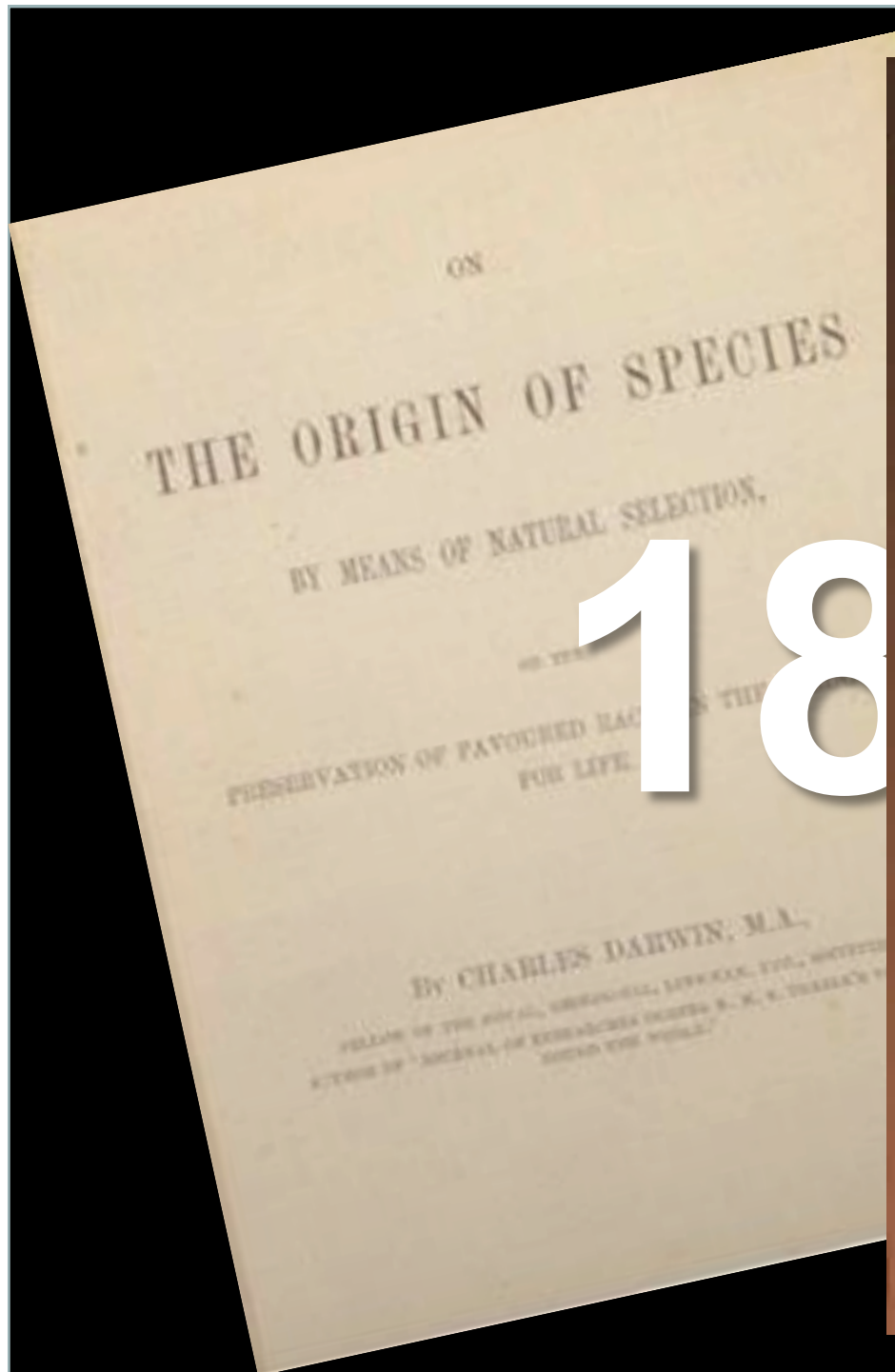


Poma et al., 2009









“When on board H.M.S. Beagle, as naturalist, I was much struck with certain facts in the distribution of the inhabitants of South America, and in the geological relationships of the present to past inhabitants of that continent. These facts seemed to me to throw some light on the origin of species—that mystery of mysteries, as it has been called by one of our greatest philosophers”



The *first* phrase of the *first* page of the *first* edition of “On the origin of species” by Charles Darwin, 1859

Muchas gracias . . .



FRANCIS BACON
From a painting