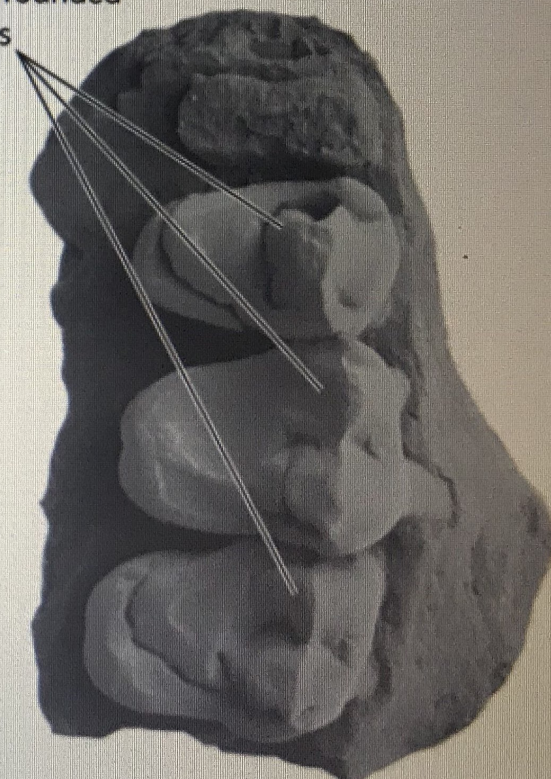


## 9.4 Coming to America: Origin of New World Higher Primates

*Aegyptopithecus*, the earliest definitive catarrhine, clearly evolved from some anthropoid in the Old World, almost certainly in Africa. But where did the other anthropoids, the platyrrhines, come from? The first South American primate is a primitive monkey called *Perupithecus*, represented by fossil molars from Santa Rosa, Peru, dating possibly as early as 36 mya. This primate is clearly more primitive than the next oldest platyrrhine fossil, *Branisella*, found near Salla, Bolivia, in geologic deposits dating to the very late Oligocene, about 26 mya. *Branisella*'s link with living species of platyrrhines is especially convincing owing to its having three premolars and, especially, three upper molars with a four-cusp chewing surface strongly similar to that of the upper molars in living

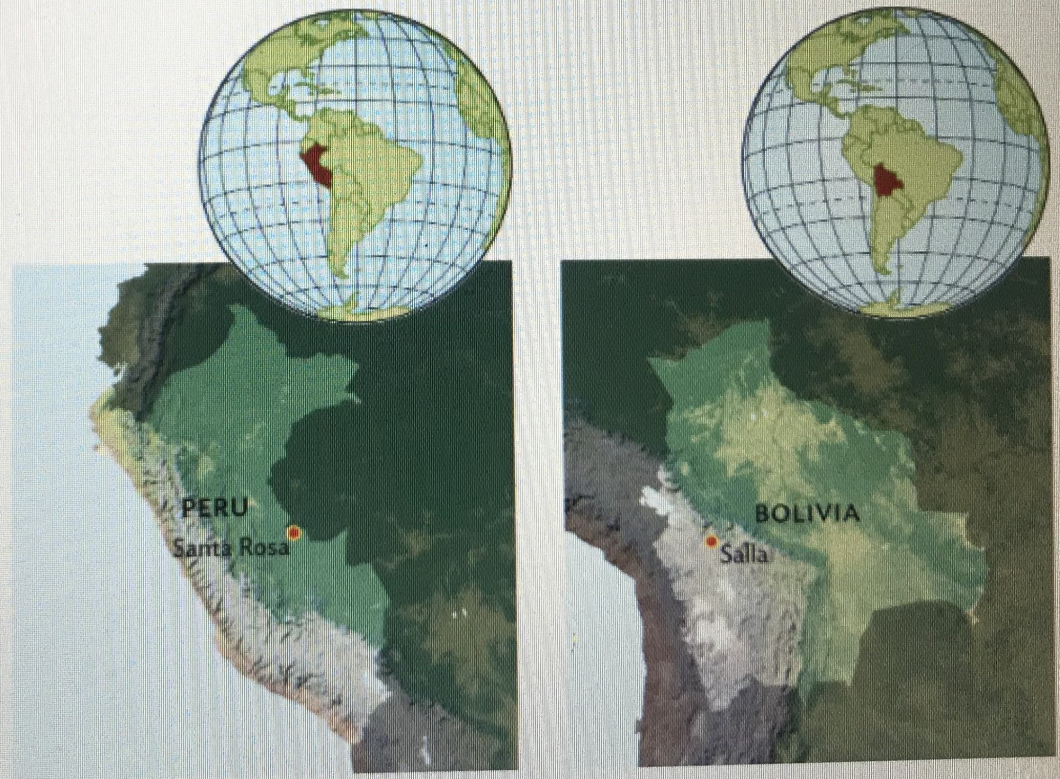
Low, rounded cusps



**FIGURE 9.15**  
**Branisella** In the dental remains of this first definitive platyrrhine, the low, rounded cusps of

similar to that of the upper molars in living New World monkeys, such as the owl monkey (Figure 9.15). The fossil record for South America is generally sparse after the Late Oligocene, but it shows the general patterns of platyrrhine evolution. The fossil platyrrhines bear a striking resemblance to living platyrrhines, represented by cebids and atelids.

**Branisella** In the dental remains of this first definitive platyrrhine, the low, rounded cusps of its molars suggest that *Branisella* was frugivorous.



### How Anthropoids Got to South America

### How Anthropoids Got to South America

One important question about the origins of platyrrhines is just how their ancestors got from Africa to South America. Four alternative hypotheses have emerged to explain primates' presence in South America (Figure 9.16). First, platyrrhines evolved from a North American anthropoid, then migrated to South America in the Late Oligocene. Second, platyrrhines evolved from an African anthropoid and migrated across the Atlantic to South America. Third, platyrrhines evolved from an anthropoid in Africa that migrated south (mainly) on land to Antarctica and then to Patagonia, at the southern tip of South America. Fourth, Old World and New World anthropoids evolved independently from different lineages in Africa and South America, respectively.

One hypothesis suggests that the ancestors migrated south from North America, evolving into the platyrrhine species of the Oligocene.



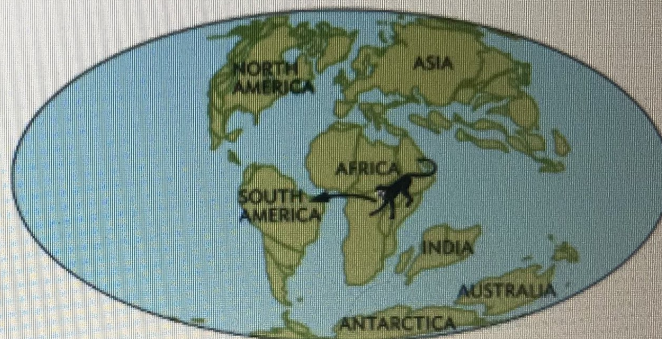
A second hypothesis suggests that after originating in Africa, the ancestors migrated across the Atlantic Ocean to South America.



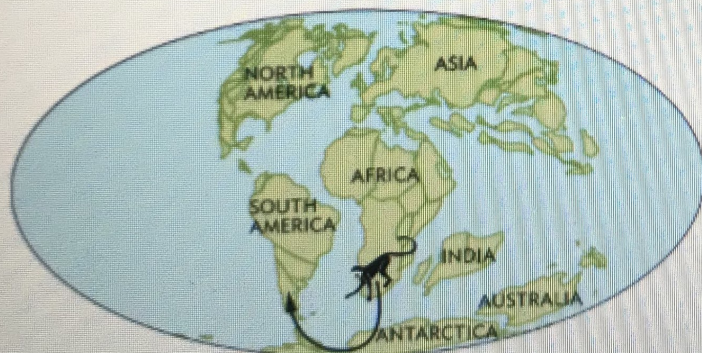
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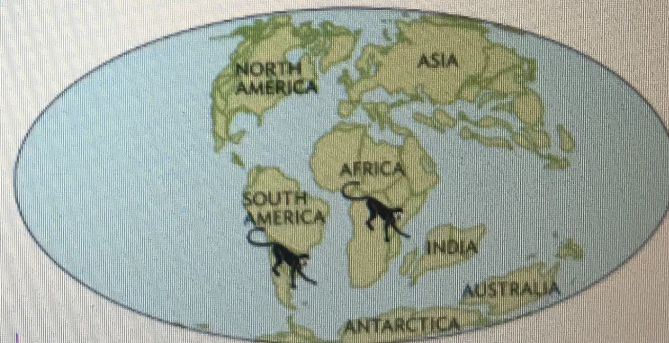
A second hypothesis suggests that after originating in Africa, the ancestors migrated across the Atlantic Ocean to South America.



A third hypothesis suggests that the African ancestors reached South America not only by water but also by land; they migrated to the southern tip of Africa, crossed Antarctica, and eventually reached the southern tip of South America.



A fourth hypothesis suggests that platyrrhines and catarrhines originated independently.



**FIGURE 9.16**

**Platyrrhine Origins** Many researchers believe the ancestors of New World monkeys originated in North America. Others believe they originated in Africa and then migrated to South America. As Africa and South America separated in the Mesozoic, how would ancestors in Africa have reached South America?

No evidence supports the first hypothesis—there were no anthropoids in North America during the Eocene or Oligocene. There were various Euprimates, but none resembled the platyrrhines in South America during the Late Oligocene.

Evidence supports the second hypothesis. There were early anthropoids in Africa (Fayum) beginning in the Late Eocene, and they predated platyrrhines but looked remarkably similar to the earliest platyrrhines in South America (for example, they had three premolars). This resemblance indicates that platyrrhines originated in Africa *before* their appearance in South America. In addition, fossils indicate other similarities between animals in Africa and in South America.

The strong similarities between Old World and New World higher primates also support the third hypothesis. Migration across Antarctica would be impossible today, of course. However, migration over this major landmass would have been possible through much of the Eocene, when the climate there was much warmer and drier than it is today.

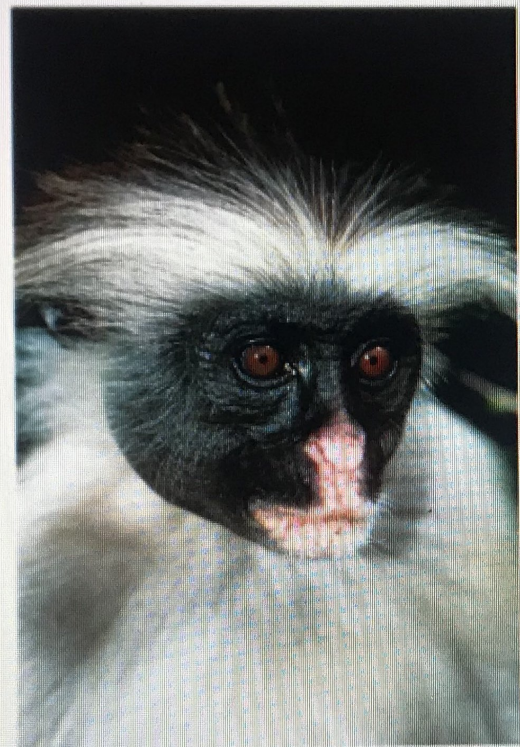
Given the strong anatomical resemblance between African higher primates and South American higher primates, it is highly unlikely that anthropoids evolved independently in Africa and South America (**Figure 9.17**). DNA evidence showing a strong relationship between Old World and New World higher primates is even stronger proof

Old World and New World higher primates is even stronger proof against the fourth hypothesis. In other words, these two groups did not evolve independently: they both originated in Africa.

On the face of it, it might seem unlikely that primates migrated from Africa to South America via the Atlantic, especially in view of the wide and prohibitive expanse of open sea separating the west coast of Africa from the east coast of South America. At the time, however, areas of the ocean might have been shallow and dotted with series of islands. Moreover, primates might have crossed from Africa to South America via ocean currents, on natural rafts consisting of accumulated vegetation.



vegetation.



(a)



(b)

**FIGURE 9.17**

*Old World and New World Monkeys* The physical resemblance of (a) Old World monkeys and (b) New World monkeys suggests that platyrrhines originated in Africa, rather than North America. Their mode of reaching South America, however, is still highly debated.