

REVIEW

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The iconographic evolution of Patagonian and Fuegian canids

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Abstract

Background We assess the putative identity of canids accompanying the Patagonian and Fuegian aborigines through an iconographic timeline encompassing 1699–1894, when a number of narratives provided written descriptions and illustrations of those aborigines and their canids. We determine what type of “dogs” were those canids, disentangling their type or breed group, to reveal their characteristics, composition, and development during that period.

Methods We searched for illustrations published by navigators and explorers where the presence of canids was reported in the historical territory of the Patagonian aborigines (Aónikenk, Kawésqar, Manek’enk, Sélk’nam, and Yahgan). We constructed a matrix to record the descriptions of all canids represented in those illustrations. Their characterization included body size, coat, tail, ears, skull, and attitude, among others. We then classified whether they were morphologically closer to domestic dogs or to foxlike canids. We used the morphological appearance of dogs to classify them into breed types, whenever possible.

Results and discussion We identified and classified 61 canids from 26 illustrations in accounts published between 1699 and 1894. From a historical perspective, those accounts suggest that soon after the first contacts with Europeans, the Patagonian and Fuegian aborigines began to exchange and breed dogs of non-native origin, initiating an extended process of mixing between aboriginal foxlike canids and European dogs. From a cynological perspective, the foxlike canids associated with the aborigines were widely present only before 1833, exhibiting an homogeneous appearance with a solid coat, pointed snout, small erect ears of high insertion, and fallen and bushy tail. After 1833, the canids depicted show a more varied appearance and mixed coat, with blunter snout, drooping ears at lower insertion, and erect fine tail with sparse hair. Most of these were hunting dogs morphologically similar to modern breeds such as pointers/setters, hounds, terriers, and retrievers.

Keywords Aborigines, Argentina, Chile, Dog, Foxlike, Patagonia, Tierra del Fuego

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Background

The presence of tamed or domesticated canids among the aboriginal groups of Austral Patagonia –Chonos, Kawésqar, and Aónikenk– and Tierra del Fuego and surrounding archipelago –Sélk'nam, Manek'enk, and Yahgan– has been reported with different degrees of detail practically since the initial encounters with European navigators at the beginning of the sixteenth century. Antonio Pigafetta, chronicler of the circumnavigation expedition commanded by Ferdinand Magellan [1], included in the narrative of the trip a brief vocabulary of terms used by the Aónikenk he called “Patagones,” with whom the explorers established a relationship from March to August 1520 in and around the bay of San Julián (49°20'S, 67°45'W), on the Patagonian Atlantic coast. Among these terms, Pigafetta included the word “holl” ([2] page 129) by which the Aónikenk called their canids. More specific are the mentions that Pedro Sarmiento de Gamboa made of such canids in the context of the second and unsuccessful colonizing expedition that he carried out on the northern coasts of the Strait of Magellan. In March 1584, from near San Gregorio Bay (52°38'S, 70°08'W), he recounts an encounter with the Aónikenk, who were accompanied by tame or domesticated canids “of different colours, much larger than those of Ireland, and there are many in that land” ([3] page 319). For the area of the western Patagonian archipelago, the first mention of the presence of canids among the aborigines was reported by the navigator Francisco de Cortés Hojea. In 1558, while exploring the Chonos archipelago (45°08'S, 73°57'W) he commented, in relation to the clothing of its inhabitants that “...their clothing is made of wool from small woolly dogs that they breed ...” ([4] page 518).

The earliest allusion of dogs accompanying aborigines on the great island of Tierra del Fuego comes from the narration of the first voyage of the Englishman James Cook, when in December 1769 their exploration anchored in Good Success [Buen Suceso] Bay (54°47'S, 65°15'W), at the southeastern end of that large island. Here, while visiting a settlement of a Manek'enk group, he noted that: “In this place we saw no quadruped except seals, sea-lions, and dogs: of the dogs it is remarkable that they bark, which those that are originally bred in America do not. And this is further proof, that the people we saw here had, either or remotely, immediately communicated with the inhabitants of Europe” ([5] page 27). In addition, regarding the southernmost region of the Tierra del Fuego archipelago, we can mention the case of the sealer James Weddell, who obtained one canid from the Yahgan during his stay in Wigwam Cove, on the southeastern coast of Hermite Island (55°50'S, 67°25'W). He recorded in his narrative that, while anchored in that bay in November 1823, “I procured a young dog from them,

which was remarkable for its cunning; they have only one kind of this animal, and it partakes much of the nature of the fox, resembling it a good deal about the head, and being nearly the size of the terrier” ([6] page 158).

From the fragments presented –in addition to those that we will analyze later– we should mention other cases recorded throughout the 16th, 17th, and eighteenth centuries: In May 1578 the Englishman Francis Drake, being at 47°S (Atlantic Patagonian coast) in the middle of a hunt for rheas referred that “...with their dogs which they have in readinesse at all times, they overthrow them, and make a common quarry...” ([7] pages 19–20). In March 1619, the Spaniards Bartolomé Nodal and Rodrigo Nodal reported having seen in the vicinity of Dungeness Point (eastern mouth of the Strait of Magellan) “...tracks of guanaco, cattle, and dogs...” [8] page 53). In December 1767, the Frenchman Louis A. Bougainville, while in a bay called Boucault near San Gregorio Bay, commented that the Aónikenk had “...small and ugly dogs, which, like their horses, drank sea water; fresh water was very rare on this coast and the same in the interior...” ([9] pp. 168–169). Finally, we can mention an interesting observation made by the Spanish captain Antonio de Córdoba in January 1786 while describing the Magellanic territory: “The dogs are such faithful companions of these Indians that they were rarely seen without a large number of them: Their breed is almost the same to that which in Buenos Ayres they call Cimarrones and from which they surely owe their origin, to where they were taken by the Europeans, given that the Historians of America say it is true and that Cook confirms it in his first trip to the South Sea, that the aboriginal dogs of the country do not bark; those who were found among these men made it known from a long distance away [because they barked] that they were natives of the Old Continent.” ([10] page 307).

Previous research has highlighted the diverse roles domesticated canids play in human societies, ranging from hunting aids to companions. Nevertheless, studies on the relationships between humans and wild canids have been limited [11]. Our research aims at identifying the canids that accompanied Patagonian and Fuegian aborigines. Were these animals tamed foxes or domestic dogs? We address this question by analyzing representations of canids in illustrations and descriptions encompassing 1699–1894, to elucidate their characteristics, composition, and historical development.

Methods

Illustrations selection

Our search approach was focused on identifying all the graphic representations of canids associated with the southern aboriginal peoples—Aónikenk, Sélk'nam, Manek'enk, Kawésqar, and Yahgan—, in the area

delimited from the Santa Cruz River (50°S) to the end of the Tierra del Fuego archipelago (56°S). We initially relied on James Burney's detailed chronological account in his classic five-volume work, "A Chronological History of the Discoveries in the South Sea or Pacific Ocean" [12] which was instrumental in identifying and discarding—for not including visual representation of canids—documentary sources from the sixteenth century to the year 1764. In total we reviewed 13 primary sources associated to the expeditions of Fernando de Magallanes, Juan Ladrillero, Francis Drake, Pedro Sarmiento de Gamboa, Jacob Mahu-Simon de Cordes, Oliver Van Noort, Joris van Spilbergen, Jacob Lemaire and Willem Schouten, John Narborough, Jean Baptiste de Genes, Jacques Gouin de Beauchêne, John Byron, and Louis Bougainville.

For the period afterwards, we relied on our capacity as experts on the subject and extended our review to other documentary sources through a web search in the databases of www.archive.org and www.memoriachilena.com. In this second part of the search, we were able to find 9 sources with graphic records of canids, out of a total of 27 texts reviewed (including primary and secondary sources). We accessed 24 primary sources associated to the expeditions of James Cook, Philip Carteret, Antonio de Córdoba, Alejandro Malaspina, Philip King, Robert Fitzroy, Jules Dumont D'Urville, Titus Coan and William Armes, Charles Wilkes, Benjamin Morrell, Edmund Fanning, John Williams, Benjamin F. Bourne, Richard Mayne, George Musters, Julius Beerbohm, Florence Dixie, George Nares (Challenger and Alert), Louis Ferdinand Martial, Deniker and Hyades, Luiz Philippe de Saldanha, Theodor Ohlsen, Lucas Bridges, and John Spears. In addition, we reviewed 3 secondary sources made up of collected images of austral aborigines [13–15]. Each selected graphic record was complemented by a corresponding textual record, including navigation narratives, travel diaries and illustration atlases, providing production context in most cases.

The illustrations were distributed in 12 different documentary sources, consisting of 7 navigation narratives (Francis Froger, engineer Duplessis, Philip King, Robert Fitzroy, Louis Martial, Joseph Deniker and Paul Hyades, Robert Cunningham), 3 travel or adventure diaries (George Musters, Julius Beerbohm, Florence Dixie, John Spears), and 2 illustrated atlases (Jules C. D'Urville, Theodor Ohlsen). This way, the documentary corpus of 26 illustrations was divided into 23 drawings/engravings, 2 watercolors, and 1 photograph. To obtain images in good resolution, we were able to access the Photographic Archive of the Center for History and Archeology Studies (Institute of Patagonia, University of Magallanes) and the Mateo Martinic Beros Bibliographic and Documentary Fund (University of Magallanes), repositories from which

we accessed most of the images included in the work, with the exception of Fig. 1a, b and c.

The time span considered went from 1699 to 1894. The three illustrations from the end of the seventeenth century are remarkable, because as far as we know they are the first of canids accompanying southern aborigines, in this case a Kawésqar group. Instead, for the eighteenth century no graphic records were found showing canids, which explains the temporal hiatus between 1699 and the images that emerged after Philip King's expedition. Coincident with the completion of that British expedition, it is the beginning of the period where realistic records begin to appear and abound, far from the fantastic and exotic representations that dominated the artistic representations of the territory, fauna, and inhabitants of the extreme American south [16, 17]. Officers King and Fitzroy themselves acted as occasional illustrators, but the one who really stood out in this context was the artist Conrad Martens, both for the illustrations contained in volume II of the expedition, but also for the series of illustrations he left for posterity in a series of notebooks or sketchbooks [18]. As a background, for the 1842 edition of James Cook's voyages ([5] page ix), the illustrations used were based—among others—, on the voyages of the ships *Adventure* and *Beagle* and on the French expedition led by Jules Dumont D'Urville. For its part, the end of the nineteenth century was not an exclusion criterion to determine the arrival of canids brought from other parts of America and Europe, given that their presence was known prior to the installation of the extensive livestock industry in southern Patagonia (e.g., [19]), and in the current Region of Magallanes and Chilean Antarctica, towards the end of the 1870s [20].

Describing canids from illustrations

We constructed a matrix to record the descriptions of all canids represented in the illustrations. Each row represented an individual canid, and each column a characteristic. For each illustration, we assigned a unique identifier, the artist who created it, the date of the image, the geographic location, and the aboriginal people represented (Additional 1). This information was obtained from the original sources. The canids in each image were individualized by identifying them with a sequential number following a left-to-right, top-to-bottom pattern within the illustration.

During the process of canid domestication, selection for tameness has been proposed to result in a domestication syndrome, characterized by correlated morphological, physiological, and behavioral traits (reviewed in [21]). Morphologically, a transition from a wild-like morphotype to a domesticated one can be observed. A wild-like morphotype in canids is characterized by long

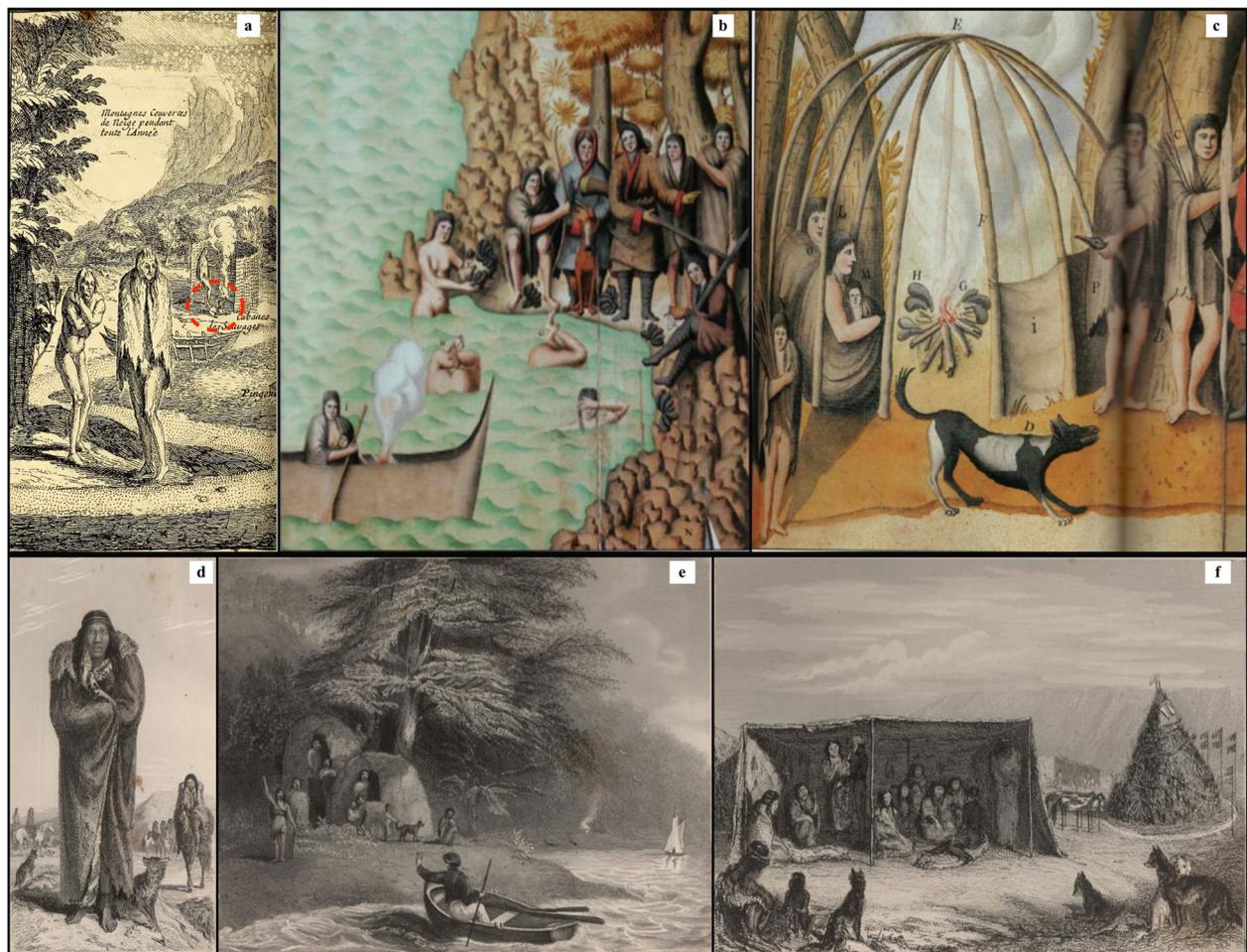


Fig. 1 Patagonian and Fuegian canids depicted in illustrations by various authors, 1696–1830

bushy tail, erect ears, and pointed snout. In contrast, domesticated morphotypes may exhibit a wide range of ear shapes and sizes –often floppy or semi-erect–, and varying snout lengths and shapes. Belyaev’s [22] farm-fox experiment provides significant evidence of this evolutionary transition from wild to domesticated canid morphotypes. We defined a set of morphological traits to record from the canids in the illustrations, including body size, sex, and descriptions of coat, tail, ears, and skull; in line with those traits considered in the morphological dimension of the domestication syndrome (Table 1). Based on these traits, we classified whether the canids were morphologically closer to domestic dogs or to wild-like canids, here referred to as foxlike [21].

Dogs have been subjected to strong artificial selection for at least 9,000 years [23]. However, the development of modern canine breeds with stricter standards occurred primarily within the last two hundred years, driven by direct selection to meet specific working or aesthetic

criteria [24, 25]. Consequently, breed standards were not established until the late nineteenth century, and before that domestic dogs were typically grouped based on their morphology and function (i.e., “breed-types”).

Building on previous studies of canid morphology [26–28], we classified dogs into breed-types based on their morphological appearance, whenever possible. Additionally, we used the Federation Cynologique Internationale (FCI) criteria as a guide for this classification. We also noted additional information, such as the apparent attitude displayed (e.g., hunting, resting, guarding), presence of other domestic animals (e.g., horses), and any accessories on the canids (e.g., collar).

To further support our canid classification, we used the FactoMineR package [29] in R [30], which performs a Multiple Correspondence Analysis (MCA) allowing to visualize the association between the morphological traits described in Table 1 and the classification of canids. To describe the dimensions of the MCA we used the dimdesc function from the FactoMineR package.

Table 1 Fifteen morphological traits used to describe Patagonian and Fuegian canids from 26 illustrations published between 1699 and 1894

Trait	Description of canid	Discriminating categories
Sex	"Male" or "Female," when identifiable in the illustration	Male, Female, Unknown
Body size	Estimated from other elements in the illustration (humans, trees, etc.): "Small" (24–35 cm height at withers); "Medium" (35–45 cm height at withers); "Large" (45–60 cm height at withers)	Small, Medium, Large
Coat color	Following the standardized nomenclature of coat colors in dogs from the Federation Cynologique Internationale (FCI): "Solid" containing one pigment; "Mixed" containing two pigments, dark and pale with white being absent; "Modified" where white is present, the basal coat can still be identified, but has undergone modifications in the original aspect	Solid, Mixed, Modified
Coat pattern	Using the FCI nomenclature. For solid coat: "Dark," "Pale," or "White;" for mixed coat: "Fawn" (sandy) with black overlay; for modified coat: "Mottling" where only the dark pigment is concerned, the ground color is paler or even lacking pigment, while the normal color is maintained as rough-edged (torn) patches distributed unevenly. "Spotting," which can be limited, moderate, or invasive	Dark, Pale, or White for solid coat; Fawn for mixed coat; Mottling or Spotting for modified coat
Hair length	Overall length of the hair	Short, Medium, Long
Hair length disparity	Length of the coat hair relative to hair length on the feet	1 to 1, 1 to 0, 0 to 1
Tail shape	In relation to the density and length of the hair, and tail disposition	Fallen and fine, Fallen and bushy, Erect and fine, Erect and bushy, Curly sparse, Curly bushy
Tail length	Length of the tail	Short, Medium, Long
Ear size	Size of the ears	Small, Medium, Large
Ear shape	Shape of the ears	Ovoid, Triangular
Ear insertion	Insertion of the ears on the head	Low, Medium, High
Ear disposition	Position of the ears	Drooping, Semierect, Erect
Skull type	Shape of the skull	Dolichocephalic, Mesocephalic, Brachycephalic
Frontonasal depression	Profile on the head in the frontonasal area	Slight, Medium, High
Snout shape	Shape of the snout	Square, Pointed

Geographical disambiguation: Patagonia and Fuegia

We paraphrase the following from Jaksic and Castro [31]: Patagonia is a rather imprecise geographical term than nonetheless is attributed to lands in the southern section of the Andes Mountains, in both Argentina and Chile; with lakes, fjords, temperate rainforests, and glaciers in the west and deserts, tablelands, and steppes to the east. Patagonia is bounded by the Pacific Ocean on the west, the Atlantic Ocean to the east, and three seawater passages that connect them, including the Strait of Magellan, the Beagle Channel, and the Drake Passage to the south. The Colorado and Barrancas rivers, which run from the Andes Mountains to the Atlantic Ocean, are commonly considered the northern limit of Argentine Patagonia while the western-projected northern limit of Chilean Patagonia is at Huincul Fault, in Araucanía Region. Austral Patagonia is a complementary concept that encompasses all these binational features, which involve administrative territories in Argentina (Provinces of Santa Cruz and of Tierra del Fuego) and Chile (Regions of Aysén and of Magallanes), both continental and insular ([32] page 19).

The archipelago of Tierra del Fuego, south of the Strait of Magellan is sometimes included as part of Patagonia. Tierra del Fuego is also an ambiguous geographic term: It may refer to the archipelago (Archipiélago de Tierra del Fuego or Archipiélago fueguino) or to the island proper (Tierra del Fuego Island, or Fuegia, or Fireland, or Feuerland, or Isla Grande de Tierra del Fuego). The Fuegian archipelago contains the large Tierra del Fuego Island (ca. 48,000 km²), seven medium-sized islands (Hoste, Santa Ines, Navarino, Dawson, Aracena, Clarence, and Staten, ranging from 4,100 to 500 km² in the same sequence), and ca. 3,000 smaller islands and islets, the best-known being, alphabetically, Cape Horn, Lennox, Nueva, Picton, and Riesco. Most of these smaller islands are located to the southwest of Tierra del Fuego Island, separated by the Strait of Magellan and the Beagle Channel. The large island is split east–west between Argentina and Chile (40:60), respectively, at meridian 68°34'W, and most other islands (Staten Island excepted: 54°47'S, 64°15'W) are in Chilean territory.

Peoples disambiguation: Patagonian and Fuegian

During the last millenium, the Fuegian archipelago has hosted four different peoples: Kawésqar or Alacalufe, Manek’enk or Haush, Sélk’nam or Ona, and Yahgan or Yamana. The Sélk’nam branched out from the Aónikenk (=Patagonian or Telhuelche people) on the South American mainland and migrated across the Strait of Magellan to the large Tierra del Fuego Island, where they concentrated on the northeastern area of the island (ca. 54°S, 68°W), although they sporadically reached southward to the Beagle channel (ca. 55°S, 68°W). The Manek’enk lived on the Mitre peninsula (54°46’S, 65°46’W) in southeastern Tierra del Fuego Island and were culturally and linguistically related to the more northerly Sélk’nam. Unlike the three previous peoples (“foot Indians”), the next three were nomadic seafaring, or “canoe Indians.” The Kawésqar concentrated mostly on islands to the south of the Gulf of Penas (47°22’S, 74°50’W), around Wellington (49°20’S, 74°40’W), Desolación (53°06’S, 73°54’W), and Santa Inés (53°45’S, 72°45’W) islands, and around Brunswick peninsula (53°30’S, 71°25’W). The term guaicurúes or zapallos was applied derogatorily by the Aónikenk to mestizos between themselves and the Kawésqar. The Yahgan traditional territory included the islands south of the Strait of Magellan (which follows a northwest to southeast course encompassing ca. 52–54°S, 68–75°W) and the Beagle Channel (54°52’S, 68°08’W), extending their presence into Cape Horn (55°59’S, 67°17’W), making them the world’s southernmost human population. The Chonos were found in a more northerly position (outside the Fuegian archipelago), in the archipelagos of Chiloé, Guaitecas, and Chonos, roughly spanning from Calbuco (41°46’S, 73°08’W) and southernmost Chiloé Island (43°06’S, 73°44’W) to Taitao peninsula (46°30’S, 74°25’W). Still, all these peoples overlapped geographically to some extent and traded goods among them [33].

Canids disambiguation: Patagonian and Fuegian

We adapt the following from Jaksic and Castro [31] and Jaksic et al. [34]: Apparently, all Patagonian and Fuegian peoples had “dogs,” but not necessarily the domestic variety *Canis lupus familiaris*. Indeed, the descriptions, illustrations, and photographs available show a wide variety of shapes, sizes, colors, hair lengths, and coloration patterns of their canids, with perhaps a defining cleavage being that the Kawésqar’s and Yahgan’s Fuegian canids appear to be smaller than those of the Aónikenk’s or Sélk’nam’s “dogs.” Jaksic and Castro [31] and Jaksic et al. [34] discussed that the original Fuegian canid was indeed a *Canis lupus familiaris* brought along ca. 9,000 year

by the incoming natives after the Bering’s crossing [35] and that the Patagonian “dog” was a tamed Fuegian fox *Lycalopex culpaeus*. The latter was apparently progressively replaced by the more gregarious, human-friendly, and colorful domestic dogs brought by European explorers, adventurers, colonizers, and settlers of Patagonia and Tierra del Fuego during the 1800s. Whether these two canid types were of domestic *Canis lupus familiaris* or of tamed *Lycalopex culpaeus* stock, or a mixed breed, is still unresolved. Toward which we offer this current contribution.

Results

Illustrations depiction

The illustration in Fig. 1a was authored by the Frenchman François Froger, who also wrote the narrative of the trip of which he was part and was commanded by Jean Baptiste de Gennes, with the aim of looting the coastal settlements of Chile and Peru. The expedition was a complete failure, only managing to reach the southwestern coast of the Strait of Magellan, from where they had to return to Europe. During their stay on the Patagonian coast from February to early April 1696, they sighted a group of Kawésqar in what is currently the mouth of the San Juan River (53°38’S-70°55’W), on the southeastern coastline of the Brunswick Peninsula. The illustration shows in the background, a canid in front of a room and a bonfire guarded by an aborigine. In the description of this illustration, with epigraph “Sauvages du Detroit de Magellan”, Froger pointed out that the Kawésqar had “(...) 5 or 6 little dogs that undoubtedly were useful for hunting” ([36] page 97).

Illustrations in Fig. 1b and c were recorded by one of the members of the French expedition led by Jacques Gouin de Beauchêne, which from June 1699 to January 1700 stayed and toured the southern and southwestern coast of the Strait of Magellan, before continuing its journey northwards, to the coasts of Chile and Peru. The authorship of both watercolors and one of the sources that narrate the journey, corresponds to the engineer Duplessis ([37] his first name is unknown) and shows scenes of the interaction between Kawésqar aborigines and French sailors in the southwestern area of the Brunswick Peninsula (53°53’S-72°15’W). The caption included in Fig. 1b states: “M is a wild dog that they gave us” ([38] page 180), while that in Fig. 1c refers: “D is one of their dogs, which they use to hunt when the prey is wounded” ([38] page 181).

In Fig. 1d, e, and f, illustrations were authored by the British sailor Phillip Parker King, commander of the first phase of hydrographic survey that the Admiralty carried out on the southern coasts of South America, spanning the years 1826 to 1836 [39]. King commanded the initial

phase that developed from 1826 to 1830. Figures 1d and 1f were titled, respectively, “Patagonian” and “Patagonian ‘toldo’ and tomb” and show three and four canids, respectively, around a camp (= aike) of an Aónikenk tribe in the San Gregorio Bay area (52°03’S-70°08’W), on the north-eastern coast of the Strait of Magellan. Figure 1e was titled “Fuegian wigwams at Hope harbor in the Magdalen channel” and illustrates a location of a Kawésqar family in the Magdalena channel (54°20’S, 71°00’W), southwestern sector of the Strait of Magellan, where in the background and in the center a canid is seen next to one of the children. Several interesting descriptions are made of the canids of the Kawésqar: [39] page 45: “This canoe was followed by another, containing an old man, sixty or seventy years of age, with a grey beard; an elderly woman, and two children. Before they came alongside they put their dogs on shore.” [39] page 342: “When we arrived at the wigwam, there were two women and five children inside, and a dozen dogs near it.” [39] page 444: “We bought fish from them for beads, buttons, &c., and gave a knife for a very fine dog, which they were extremely reluctant to part with; but the knife was too great a temptation to be resisted, though dogs seemed very scarce and proportionably valuable.” With regard to the Manek’enk, [39] page 448: “They had some fine dogs, one being much like a young lion; but nothing we could offer seemed, in their eyes, to be considered an equivalent for his value.” And finally, [39] page 529: “The dogs belonging to the Fuegian Indians are certainly of the domesticated kind, originally obtained, probably, from the Spanish settlements at Buenos Ayres; generally they resemble the Esquimaux breed, but are much more diminutive in size.” In this case, no ethnic group is identified.

Although not providing illustrations, it is worth mentioning the narrative of MacDouall ([40] page 133), corresponding to a group of Kawésqar in Port Gallant (53°42’S, 72°02’W) in 1827: “(...) however, they were very friendly, and a good many lances and bows and arrows were obtained from them, in exchange for beads, knives, &c.; also two of their dogs, which are a breed resembling a fox, all but in colour, which is of a dirty grey cast; the head is sharp, ears long, and the tail bushy.” And [40] pages 151–152, referring to a group of Aónikenk in San Gregorio Bay observed in May 1827: “Almost all the Indians were on horseback, and a number of large dogs were to be seen crouching down among those who had dismounted and arranged themselves in different groups; altogether they must have possessed nearly 150 dogs, and some of these animals (in packs of twenty or thirty together) were observed ranging the plain in various directions.”

Illustrations in Fig. 2a through 2d derive from the second phase of the above expedition, which extended from 1831 to 1836, this time commanded by Robert

Fitz Roy, and like the previous campaign, much of the hydrographic work was carried out around the coasts of the Strait of Magellan and the Patagonian and Fuegian archipelagos [41]. Figure 2a and b were authored by the on-ship artist Conrad Martens, who participated in the exploratory campaign from 1833 to 1834. The former (Fig. 2a), was titled “Fuegian (Yapoo Tekeenica) at Portrait Cove” and illustrates a settlement of a Yahgan group in the east coast of Navarino Island (55°05’S, 67°40’W). The other drawing (Fig. 2b), “Patagonians at Gregory Bay” shows a scene in San Gregorio Bay—a historical camp (= aike) of the Aónikenk—where three canids can be seen in the foreground and background. In [41] page 136, it is reported that: “Many large dogs, of a rough, lurcher-like breed, assist them in hunting, and keep an excellent watch at night.” Fitz Roy ([41] page 174) states: “The dogs now found in the southern part of Patagonia have a wolfish appearance—their size, colour, hair, ears, nose, tail, and form being in general much like those of a wolf; though some black or spotted dogs are also seen. The roof of the mouth is black: the ears are always erect, and the nose sharp-pointed. I should say that their usual height is about that of a large foxhound. Generally the coat is harsh or wiry, and rather short; but there are some dogs among them which have thick woolly coats, like those of Newfoundland or large shepherd’s dogs, which some resemble; others being more like lurchers; but all have a wild wolf-like look, not at all prepossessing. I had a fine dog of this kind, rather like a Newfoundland, except in physiognomy, but his habits were so savage that he came to an untimely end. These dogs hunt by sight, without giving tongue; but they growl or bark loudly at the approach of strangers. As to attachment to their masters, the dogs we had could hardly give fair testimony, having been taken (bought) from them; but to strangers they were always snappish.” It should be noted that, without providing an illustration, in [41] page 119, Fitz Roy reported that: “On the 15th, we saw the land off Tierra del Fuego, near Cape San Sebastian, and next day closed the shore about Cape Sunday, ran along it past Cape Peñas, and anchored off Santa Inez. A group of Indians was collected near Cape Peñas, who watched our motions attentively. They were too far off for us to make out more than that they were tall men, on foot, nearly naked, and accompanied by several large dogs.” Although not specified, these “Indians” must be Selk’nam or Mank’enk.

Illustrations in Fig. 2c and d were authored by Robert Fitz Roy. Figure 2c: “Fuegians going to trade in Zapallos with the Patagonians” corresponds—according to the information provided by the British seal-hunter William Low to Fitz Roy—to an apparently mestizo group that lived under the control of the Aónikenk, who derogatorily called them zapallos ([42] page 106) and who later



Fig. 2 Patagonian and Fuegian canids depicted in illustrations by various authors, 1831–1840

—after the founding of the Chilean settlement of Fuerte Bulnes (53°37'S, 70°55'W) in 1843— would become known as *guaicurúes* ([43] page 113). The caption of this illustration is somewhat deceiving ([41] between pages 170–171): Those “Fuegians” are the “Zapallos” on their way to trade with the “Patagonians,” namely the *Aónikenk*. Independently of the preceding, here (Fig. 2c) two canids can be seen in the foreground on the left of the illustration, while two others are in the back: one at the center the other on the right.

The second illustration (Fig. 2d) is titled “Woollya” and illustrates a scene in the cove of the same name located in the Fuegian Archipelago, where three canids are in the foreground, while in the background and to the left, another canid can be seen among several aborigines. In [41] pages 200–201, Fitz Roy describes: “Having now mentioned all that I know respecting the Canoe Indians (excepting some facts related by Capt. King in vol. i.), I will add a few words about their constant and faithful companion, the dog: and then continue the narrative. The

dog of a Fuegian or Chonos Indian is small, active, and wiry, like a terrier with a cross of fox. His hair is usually rough, and dusky, or dark-coloured; but there are many dogs among the Fuegians almost white, or prettily spotted, some of which have fine smooth hair. All that were examined had the roof of their mouth black, the ears erect, large, and pointed; the nose sharp, like that of a fox; the tail drooping, and rather inclined to be bushy. They are exceedingly vigilant and faithful. Their sagacity is shown in many ways, some of which I have already noticed; and not least, in their providing for themselves, each low-water, by cunningly detaching limpets from the rocks, or by breaking muscle and other shells, and then eating the fish. These dogs bark at strangers with much fury: and they give tongue eagerly when hunting the otter.* (*) Byron says they do so likewise when driving fish into corners.”

The lithographs in Figs. 2e through 2g were produced in the context of the French expedition destined to explore the Antarctic continent. It was executed in the

years 1837–1840 and was led by Jules Dumont d’Urville [44]. On their way to Antarctica they entered the Strait of Magellan, one of whose landings took place in Peckett Bay or Port (52°45’S-70°45’W), on the northeastern coast of the interoceanic passage. Here, in January 1838, they established a friendly relationship with a group of Aónikenk, part of whose scenes were later artistically represented and published in 1846 in volume I of the *Pittoresque Atlas* that complements the narration of the journey. Like the aike or camp of San Gregorio, Peckett was also a place of habitual residence of the Aónikenk. In Figs. 2e (“Campement de patagons au havre Pecket, détroit eu Magellan”), 2f (“Groupes de patagons au havre Pecket”), and 2g, two, three and one canid(s), respectively, appear in the foreground, in the middle of a vivid familiar scene from the Aónikenk camp ([39] pages 21, 22, and 7 [frontispiece]).

As for the illustration “Hunting Guanacos in Patagonia” (Fig. 3a), it represents a scene in which Aónikenk and British sailors hunt guanacos, with the assistance

of canids in the Santiago Bay area (52°31’S-69°52’W), northeast coast of the Strait of Magellan, April 1867. The engraving by Frederick Le Breton Bedwell was published in 1869 in p. 153 of *The Illustrated London News* [45]. Robert Cunningham, naturalist of the expedition and participant in the hunting party, reported that “Every one being at length in the saddle, we set forth the party consisting of Captain Mayne, six officers, myself, and half-a-dozen Patagonians, who were accompanied by an equal number of smooth-haired piebald dogs, about the size of foxhounds” ([46] page 207). Previously, in [46] page 205, Cunningham had reported: “Our attention was also attracted by the ridiculous aspect of some hideous little pet dogs, apparently much prized by their owners. They were entirely naked, with the exception of the crown of their heads, which were sparsely covered with white hair, contrasting strangely with the dark hue of the body, and they had little guanaco-skin cloaks tied around them to keep them warm.” Both Bedwell and Cunningham participated in the British expedition of the corvette *Nassau*

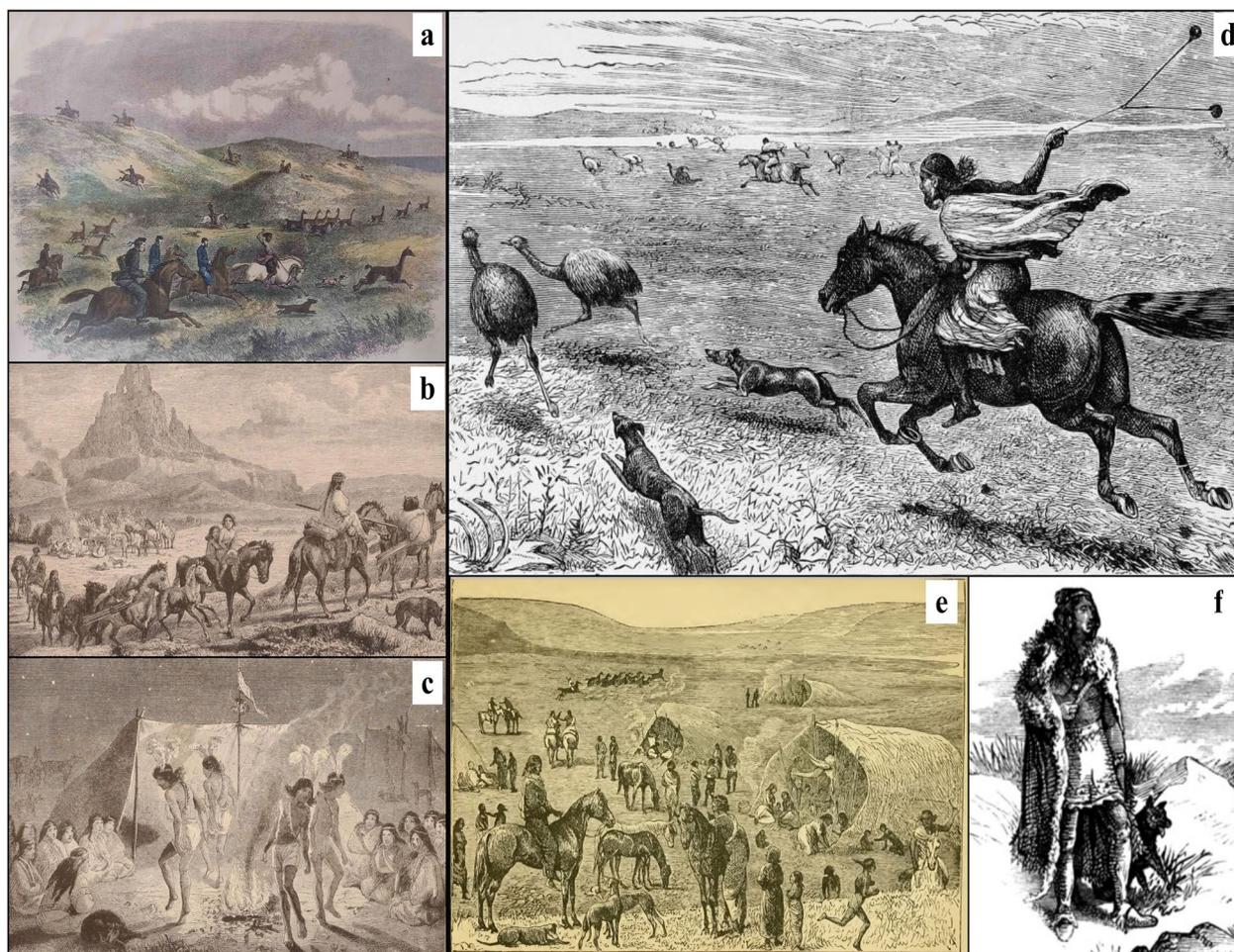


Fig. 3 Patagonian and Fuegian canids depicted in illustrations by various authors, 1867–1877

(between 1866 and 1869), which had the aim of completing the hydrographic works carried out years ago by captains King and Fitz Roy around the Strait of Magellan and the Patagonian archipelago.

The British explorer and sailor George Musters was the author of illustrations in Fig. 3b and c, inspired by his transpatagonic journey from Punta Arenas (53°09'S-70°54'W) to Carmen de Patagones (40°47'S-62°58'W) from 1869 to 1870 [19]. In these combined, seven canids can be seen, two of which can be identified with some degree of certainty. In his account, Musters provided abundant details ([19] pages 74–75): “The dogs generally in use among the Patagonian Indians vary considerably both in size and species. First of all comes a sort of lurcher (smooth haired), bred by the Indians from some obtained in the Rio Negro, the mothers being a description of mastiff, with the muzzle, however, much sharper than that of a mastiff proper; they are also very swift, and have longer and lower bodies. Our chief, Orkeke, kept his breed of this dog, which probably had been derived from the earlier Spanish settlements, pure; and they were, for hunting purposes, the best I saw, running both by scent and sight.” And in [19] pages 132–133: “Another description of dog observed had long woolly hair, and indeed much resembled an ordinary sheep dog. These were passably common among the Indians, but most of the dogs used in the chase –which are nearly all castrated– are so mixed in race as to defy specification. I heard of a dog captured from some Fuegians, which was very swift, and responded perfectly to our description of harrier. These Fuegians are probably those known as the 'Foot' Indians, who, by those who have descended on their coasts, have been observed to use dogs for hunting purposes.” For Fuegians, Musters is referring to the Aónikenk. And in [19] pages 174–175: “Casimiro informed me that Quintuhual's people formerly hunted on foot, with a large sort of dog, which, from his description of him, must have resembled a deer hound. The dogs are rarely fed, generally being allowed to satiate themselves in the chase. The hounds belonging to Orkeke, and one or two others, were exceptions to this rule, being fed with cooked meat when it was plentiful. The women keep pet lap dogs of various descriptions, generally a sort of terrier some of them much resembling the Scotch terrier. 'Ako' for instance, was to all appearance a thoroughbred dog of that breed. These little lap dogs are the torment of one's life in camp at the least sound they rush out yelping, and set all the big dogs off; and in an Indian encampment at night, when there is anything stirring, a continuous concert of bow-wows is kept up. The dogs are fierce towards strangers, but generally content themselves with surrounding them, showing their teeth and barking, unless

set on. That they are ugly customers at night an amusing instance will prove.”

The British Julius Beerbohm made a trip on horseback from San Julián (49°18'S-67°43'W), Patagonian Atlantic coast, to Punta Arenas, towards the end of 1877. In this context, he had the opportunity to interact with the Aónikenk in another of the traditional aike, namely, Dinamarquero (70°35'S-52°25'W). The adventures of this journey were reported in a book where he also included a series of drawings of his own. In the first edition of 1879 [47], Fig. 3d and e are presented in pages 53 and 104, while in the 1881 edition, along with the previous ones, the illustration in Fig. 3f appears on the frontispiece [48]. In relation to canids, Beerbohm briefly reported that “his stock-in-trade consists of ten or twelve hardy horses, five or six dogs of a mongrel greyhound species (...)” ([47] page 34). And in [47] pages 59–60: “Here I may say a few words about the dogs, of which there were in all about eighteen with us. Most of them were greyhounds of more or less pure breeds, imported by the Welsh settlers at Chubut, the others being nondescript curs of heavier build, which were useful for pulling down the guanacos brought to bay by the fleeter but less powerful greyhounds. Their various merits and formed topic of an evening's conversation, their owners comparing notes as to their respective achievements during the failings the usual day's hunting, or recalling previous performances worthy of remembrance.” Fig. 4a appeared published in the book “Across Patagonia” authored by Florence Dixie, where she narrated the adventures of the journey that in 1879 she undertook from Punta Arenas to the current district of the province of Última Esperanza [49]. Beerbohm himself participated in the expedition, and was also in charge of the drawings for the edition that appeared in 1880. The illustration corresponds to the aforementioned Dinamarquero camp, where it is possible to see two canids in the foreground ([49] page 64). Dixie also reported that, regarding the canids acquired in Punta Arenas: “He owned two very good ostrich-dogs; one, a handsome Scotch deer-hound called “Leona”, the other a black wiry dog called “Loca”, a cross between an African greyhound and an English lurcher. Gregorio had only one dog, but it was the best of the lot, often managing to run down an ostrich singly, a feat which requires immense stamina and gameness, and which none of the other dogs were able to perform” ([49] page 39). [Incidentally, there are no ostriches in South America, they are rheas].

Figure 4b corresponds to one of the many photographs captured during the development of the French expedition called Mission scientifique au Cap Horn developed in 1882 and 1883, in the southern archipelago of Tierra del Fuego. In a photograph dated December 24, 1882, an elderly Yahgan woman can be seen in the foreground

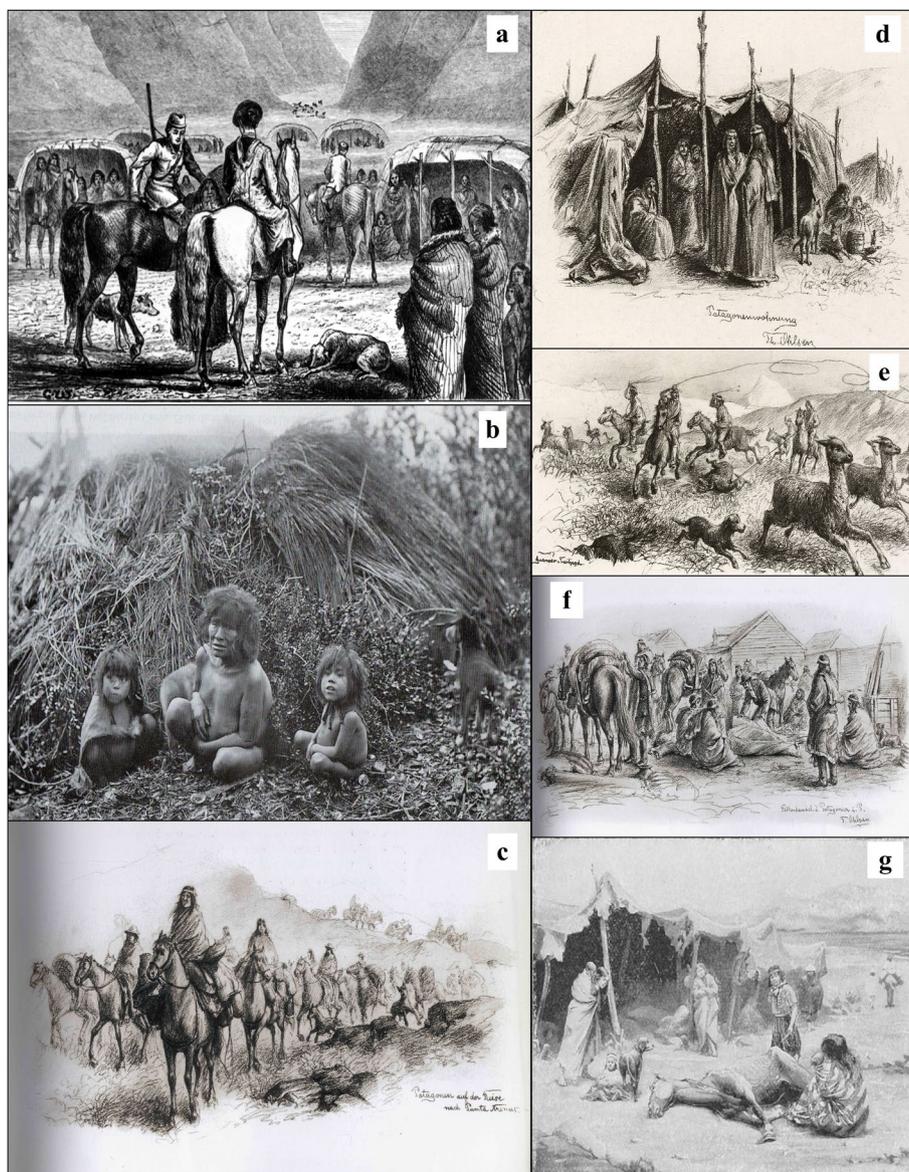


Fig. 4 Patagonian and Fuegian canids depicted in illustrations by various authors, 1877–1894

next to two infants, and in the background, on the left side, a canid ([50] page 64).

The drawings in Fig. 4c through 4f correspond to those made by the German artist Theodor Ohlsen, who, while passing through the Strait of Magellan, had the opportunity to portray a series of scenes of the physical and human geography of Punta Arenas and adjacent sectors, around the year 1883 [51]. On that occasion he had the opportunity to witness the arrival of a group of Aónikenk to the city, as well as to witness a hunting raid. The title of each illustration described its representation, namely: “Patagonen auf der reise nach Punta Arenas” or

Patagonians on their way to Punta Arenas (4c), “Patagonen” or Patagonians (4d), “Guanaco- treibjagd” or Tracking guanacos (4e), and “Fellenhandel der Patagonen in Punta Arenas” or Fur trading of the Patagonians in Punta Arenas (4f) ([51] plates 18 and 19).

Finally, the illustration in Fig. 4g was authored by the U. S. journalist John R. Spears, who toured Patagonia and Tierra del Fuego in 1893 and 1894 [52]. The image shows an Aónikenk camp in an undetermined place on the Patagonian steppe and the caption states “Tehuelches in camp.” In front of the awning (=kau) shown in the foreground, a canid can be seen next to one of the children

Table 2 Attribution of breed to 61 Patagonian and Fuegian canids depicted in 26 illustrations published between 1699 and 1894. The Unassigned category was used when no distinction could be made between foxlike canids and domestic canine breeds, and when the canid attitude was not apparent

Year	Approximate location	People	Canid	Apparent attitude	Other	Fig	Source
1699	San Juan Bay	Kawésqar	Unassigned	Rest	None	1a	Froger, F. (1698). <i>Relation d'un voyage: fait en 1695, 1696 et 1697 aux côtes d'Afrique, détroit de Magellan, Brésil, Cayenne et isles Antilles, par une escadre des vaisseaux du roy, commandée par M. De Gennes</i> . Chez Michel Brunet, Paris, pp. 96–97
1699	Brunswick Peninsula	Kawésqar	Unassigned	Guard	None	1b	Duplessis. (2003). <i>Périple de Beaufort à la Terre de Feu (1698–1701), Une expédition mandatée par Louis XIV</i> . Julie Boch (Ed.). Transboréal. p. 175
1699	Brunswick Peninsula	Kawésqar	Unassigned	Guard	None	1c	Duplessis. (2003), op. cit., pp. 186–187
1825	Fitz Roy Channel	Guaicurús	Foxlike	Hunt	None	2c	Fitz Roy, R. (1839). Narrative of the surveying voyages of His Majesty's Ships Adventure and Beagle between the years 1826 and 1836, describing their examination of the southern shores of South America, and the Beagle's circumnavigation of the globe. Proceedings of the second expedition, 1831–36, under the command of Captain Robert Fitz-Roy, R.N. Henry Colburn, pp. 170–171
1825	Fitz Roy Channel	Guaicurús	Foxlike	Hunt	None	2c	Fitz Roy, R. (1839), op. cit., pp. 170–171
1825	Fitz Roy Channel	Guaicurús	Foxlike	Hunt	None	2c	Fitz Roy, R. (1839), op. cit., pp. 170–171
1826	San Gregorio Bay	Aónikenk	Foxlike	Hunt & company	Horses	1d	King, P. (1839). Narrative of the surveying voyages of His Majesty's Ships Adventure and Beagle between the years 1826 and 1836, describing their examination of the southern shores of South America, and the Beagle's circumnavigation of the globe. Proceedings of the first expedition, 1826–30, under the command of Captain P. Parker King, R.N., F.R.S. Henry Colburn, p. II
1826	San Gregorio Bay	Aónikenk	Foxlike	Hunt & company	None	1d	King, P. (1839), op. cit., p. II
1826	San Gregorio Bay	Aónikenk	Foxlike	Hunt & company	Horses	1d	King, P. (1839), op. cit., p. II
1826	Magdalena Channel	Kawésqar	Unassigned	Guard & company	None	1e	King, P. (1839), op. cit., pp. 126–127
1826	San Gregorio Bay	Aónikenk	Foxlike	Guard & company	None	1f	King, P. (1839), op. cit., p. 495
1826	San Gregorio Bay	Aónikenk	Foxlike	Guard & company	None	1f	King, P. (1839), op. cit., p. 495
1826	San Gregorio Bay	Aónikenk	Foxlike	Guard & company	None	1f	King, P. (1839), op. cit., p. 495
1826	San Gregorio Bay	Aónikenk	Foxlike	Guard & company	None	1f	King, P. (1839), op. cit., p. 495
1833	Navarino Island	Yahgan	Foxlike	Crouch & alert	None	2a	Fitz Roy, R. (1839), op. cit., frontispiece
1833	San Gregorio Bay	Aónikenk	Foxlike	Rest & company	Horses	2b	Fitz Roy, R. (1839), op. cit., pp. 136–137
1833	San Gregorio Bay	Aónikenk	Foxlike	Rest & company	Horses	2b	Fitz Roy, R. (1839), op. cit., pp. 136–137
1833	San Gregorio Bay	Aónikenk	Foxlike	Rest & company	Horses	2b	Fitz Roy, R. (1839), op. cit., pp. 136–137
1833	Woollya Bay	Yahgan	Unassigned	Hunt & company	None	2d	Fitz Roy, R. (1839), op. cit., pp. 208–209
1833	Woollya Bay	Yahgan	Foxlike	Rest & company	None	2d	Fitz Roy, R. (1839), op. cit., pp. 208–209
1833	Woollya Bay	Yahgan	Foxlike	Rest & company	None	2d	Fitz Roy, R. (1839), op. cit., pp. 208–209
1833	Woollya Bay	Yahgan	Foxlike	Rest & company	None	2d	Fitz Roy, R. (1839), op. cit., pp. 208–209
1838	Peckett Port	Aónikenk	Dog	Hunt & company	Horses, Collar	2e	D'Urville, J. (1846). <i>Voyage au Pole Sud et dans l'Océanie sur les corvettes L'Astrolabe et La Zélée, exécuté par ordre du roi pendant les années 1837, 1838, 1839, 1849, sous le commandement de M. Dumont-D'Urville, capitaine de vaisseau</i> . Atlas pittoresque. Tome premier. Gide et C ^{ie} Éditeurs, p. 21
1838	Peckett Port	Aónikenk	Dog	Hunt & company	Horses	2e	D'Urville, J. (1846), op. cit., p. 21
1838	Peckett Port	Aónikenk	Dog	Rest	Horses	2f	D'Urville, J. (1846), op. cit., p. 22
1838	Peckett Port	Aónikenk	Dog	Rest	Horses, Collar	2f	D'Urville, J. (1846), op. cit., p. 22
1838	Peckett Port	Aónikenk	Dog	Rest	Horses	2f	D'Urville, J. (1846), op. cit., p. 22
1838	Peckett Port	Aónikenk	Dog	Rest	Horses	2g	D'Urville, J. (1846), op. cit., p. frontispiece

Table 2 (continued)

Year	Approximate location	People	Canid	Apparent attitude	Other	Fig	Source
1867	Santiago Bay	Aónikenk	Dog	Hunt	Horses	3a	Frederick Le Breton Bedwell. 14 agosto 1869, <i>Illustrated London News</i> , p. 153. The color version of this engraving is part of the Mateo Martinic Beros Bibliographic and Documentary Fund (University of Magallanes)
1867	Santiago Bay	Aónikenk	Unassigned	Hunt	Horses	3a	Frederick Le Breton Bedwell. 14 agosto 1869, <i>Illustrated London News</i> , p. 153
1867	Santiago Bay	Aónikenk	Dog	Hunt	Horses	3a	Frederick Le Breton Bedwell. 14 agosto 1869, <i>Illustrated London News</i> , p. 153
1867	Santiago Bay	Aónikenk	Dog	Hunt	Horses	3a	Frederick Le Breton Bedwell. 14 agosto 1869, <i>Illustrated London News</i> , p. 153
1867	Santiago Bay	Aónikenk	Dog	Hunt	Horses	3a	Frederick Le Breton Bedwell. 14 agosto 1869, <i>Illustrated London News</i> , p. 153
1867	Santiago Bay	Aónikenk	Dog	Hunt	Horses	3a	Frederick Le Breton Bedwell. 14 agosto 1869, <i>Illustrated London News</i> , p. 153
1867	Santiago Bay	Aónikenk	Dog	Hunt	Horses	3a	Frederick Le Breton Bedwell. 14 agosto 1869, <i>Illustrated London News</i> , p. 153
1867	Santiago Bay	Aónikenk	Dog	Hunt	Horses	3a	Frederick Le Breton Bedwell. 14 agosto 1869, <i>Illustrated London News</i> , p. 153
1867	Santiago Bay	Aónikenk	Dog	Hunt	Horses	3a	Frederick Le Breton Bedwell. 14 agosto 1869, <i>Illustrated London News</i> , p. 153
1869	Chico River Valley	Aónikenk	Unassigned	Rest & company	Horses	3b	Musters, G. (1871). At home with the Patagonians; a year's wanderings over untrodden ground from the Straits of Magellan to the Rio Negro. John Murray, pp. 74–75
1869	Chico River Valley	Aónikenk	Unassigned	Rest & company	Horses	3b	Musters, G. (1871), op. cit., pp. 74–75
1869	Chico River Valley	Aónikenk	Dog	Hunt	Horses	3b	Musters, G. (1871), op. cit., pp. 74–75
1869	Chico River Valley	Aónikenk	Unassigned	Unassigned	Horses	3c	Musters, G. (1871), op. cit., pp. 174–175
1869	Chico River Valley	Aónikenk	Unassigned	Unassigned	Horses	3c	Musters, G. (1871), op. cit., pp. 174–175
1870	Chico River Valley	Aónikenk	Dog	Hunt & rest	Horses	3c	Musters, G. (1871), op. cit., pp. 174–175
1871	Chico River Valley	Aónikenk	Unassigned	Unassigned	Horses	3c	Musters, G. (1871), op. cit., pp. 174–175
1877	San Gregorio Bay	Aónikenk	Dog	Hunt	Horses	3d	Beerbohm, J. (1879). Wanderings in Patagonia. Life among the ostrich-hunters. Henry Holt and Company, pp. 52–53
1877	San Gregorio Bay	Aónikenk	Dog	Hunt	Horses	3d	Beerbohm, J. (1879), op. cit., pp. 52–53
1877	San Gregorio Bay	Aónikenk	Dog	Rest & alert	Horses	3e	Beerbohm, J. (1879), op. cit., pp. 104–105
1877	San Gregorio Bay	Aónikenk	Dog	Rest & alert	Horses	3e	Beerbohm, J. (1879), op. cit., pp. 104–105
1877	San Gregorio Bay	Aónikenk	Dog	Rest & alert	Horses	3e	Beerbohm, J. (1879), op. cit., pp. 104–105
1877	San Gregorio Bay	Aónikenk	Unassigned	Guard & company	None	3f	Beerbohm, J. (1881). Wanderings in Patagonia. Life among the ostrich-hunters. Chatto and Windus, frontispiece
1879	San Gregorio Bay	Aónikenk	Dog	Rest & alert	Horses	4a	Dixie, F. (1880). <i>Across Patagonia</i> . Richard Bentley and Son, pp. 64–65
1879	San Gregorio Bay	Aónikenk	Dog	Rest & alert	Horses	4a	Dixie, F. (1880). <i>Across Patagonia</i> . Richard Bentley and Son, pp. 64–65
1882	Hoste Island	Yahgan	Dog	Company	None	4b	Martial, L., Deniker, J. y Hyades, P. (2007). Etnografía de los indios Yaghan en la Misión Científica del Cabo de Hornos 1882–1883. D. Legoupil y A. Prieto (Eds.) Ediciones Universidad de Magallanes, Instituto Francés de Estudios Andinos, p. 64
1883	Punta Arenas surrounds	Aónikenk	Unassigned	Hunt	Horses	4c	Ohlsen, T. (1894). <i>Durch Süd Amerika</i> . Kunstverlag von Louis Bock & Sohn, blatt 18
1883	Punta Arenas surrounds	Aónikenk	Unassigned	Hunt	Horses	4c	Ohlsen, T. (1894), op. cit., blatt 18
1883	Punta Arenas surrounds	Aónikenk	Unassigned	Rest & company	None	4d	Ohlsen, T. (1894), op. cit., blatt 18
1883	Punta Arenas surrounds	Aónikenk	Unassigned	Rest & company	None	4d	Ohlsen, T. (1894), op. cit., blatt 18
1883	San Gregorio Bay	Aónikenk	Dog	Hunt	Horses	4e	Ohlsen, T. (1894), op. cit., blatt 18

Table 2 (continued)

Year	Approximate location	People	Canid	Apparent attitude	Other	Fig	Source
1883	Punta Arenas surrounds	Aónikenk	Dog	Guard & company	Horses	4f	Ohlsen, T. (1894), op. cit., blatt 19
1894	P. Arenas-Deseado Port	Aónikenk	Dog	Rest & company	Horses	4g	Spears, J. (1895). The Gold Diggings of Cape Horn. A study of life in Tierra del Fuego and Patagonia. G. P. Putnam's Sons, p. 167

([52] page 167). And previously, [52] page 131, he mentions that among the Sélk'nam: "The dogs are a sharp-nosed but hairy lot, and they certainly keep the family warm."

Illustrations characterization

We identified 61 canids from 26 illustrations published between 1699 and 1894 (Table 2). Of the ca. 1,500 illustrations scanned in the 30 documentary sources reviewed, only 3.9% showed dogs. Of this total, 26 (1.7%) illustrations showed dogs filtered by our inclusion criteria, with 61 individuals identified. In other 33 illustrations (2.2%) dogs were also detected (56 individuals) but were not considered here because they lay outside our temporal range, came from a different geographical area, or were repetitions. Although the canids illustrated in Fig. 1a through 1c were characterized (see Additional File 1), the ambiguity of their morphology precluded us

from classifying them as either foxlike canid or domestic dog. Therefore, we labeled them "unassigned." In Figs. 1d through 1f and 2a through 2d, small to medium-sized canids can be observed, with medium-length hair that is longer on the body than on the legs, with pointed snouts, small erect ears with high insertion, and a fallen and bushy tail. These traits are consistent with a wild-like phenotype, which we refer to as foxlike, and were represented in illustrations dating back to 1833 and earlier. Based on their morphological traits, these foxlike canids became grouped together in the negative area of dimension 1 of the MCA –which captures 34.3% of the variance of the evaluated traits (Fig. 5, Table S1). This pattern was consistent even when MCA was performed considering all 61 individuals by including missing information (Fig. S1, Additional File 1).

Illustrations in Fig. 3 (a, b, e, f, g) and 4 (a, c, d, e) depict images published after 1838, where medium-sized canids

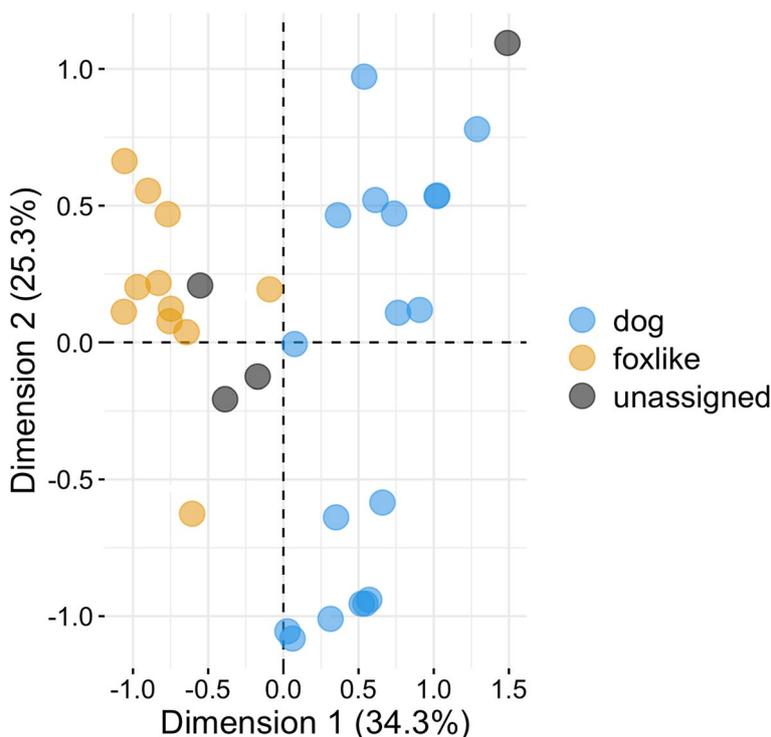


Fig. 5 Multiple Correspondence Analysis (MCA) of 33 individuals of Patagonian and Fuegian canids based on five morphological traits. The dots represent individual canids with their positions slightly adjusted to avoid complete overlap



Fig. 6 Map of Patagonia and Tierra del Fuego. The most relevant localities mentioned in the text are shown

with a variety of coat colors and predominantly short hair can be identified (Additional File 1). These canids exhibit equal hair length on the body and legs, have long tail, fine and erect or fine and fallen, indicating sparse hair on the appendix. Skull types vary, including mesocephalic and dolichocephalic, with medium-sized ears that are moderately set and can be either semi-erect or drooping. Their

snout is either pointed or square, distinguishing them from foxlike canids (Fig. 5, Fig. S1, Table S1, Additional File 1). Further, the apparent attitude of these canids in the illustrations indicates hunting purposes. Based on the depicted phenotypes, we categorized these dogs into the following types of hunting dogs: Pointers (Figs. 2e, f, g,

3a), hounds (Figs. 3b, c, d, e, 4a), terriers (Fig. 4b), and retrievers (Fig. 4e, g, S1).

Discussion

Historical perspective

Historical records, particularly those descriptions of canids left by various European people who visited the southern latitudes of America, though providing information on what the canids that accompanied the aborigines of Patagonia and Tierra del Fuego looked like, begs the question of their pre-Hispanic origin (Fig. 6). By way of example, the narrative of James Cook ([5] page 27) about his encounter with a Manek'enk party in 1769 in southeastern Tierra del Fuego Island mentions the barking capacity of their accompanying canids –an attribute that foxlike canids would lack, according to Cook. Apparently from this account, later sailors assumed a European origin for the barking dogs they saw. In the same vein, Palermo ([53] pages 65–66), based on the descriptions of canid sightings among the Aónikenk left by Francis Drake and Pedro Sarmiento de Gamboa, and shipwrecks of earlier Spanish expeditions, declared that it was not possible: “to affirm whether dog breeds had a Hispanic origin or were native breeds”.

A little less than a century before James Cook's expedition, another British navigator, John Narborough –who journeyed along the Patagonian Atlantic coast and the Strait of Magellan in 1669 and 1670– [54], concurred on the possibility of European origin of some of the Patagonian canids he saw, further being overwhelmed by the introduction of newer European dogs. Narborough commented that he had on board dogs brought from England, such as greyhounds ([54] pages 29, 38), which during the winter in Puerto San Julián –from April to September 1670– he used to hunt “hares,” guanacos, and “ostriches” ([54] pages 33, 51). In the same paragraph he mentions “we saw a Fox, a wild Dog, and five or six Hares (...)” ([54] page 33). This was reported on the 6th of March, and eight days later he referred “we saw Guianacoes [*sic*], Hares, Foxes, wild Dogs, pretty large, and a gray Cat like an English one, running up the Hills (...)” ([54] page 38). And in August, in the middle of a barter with the aborigines, he received, among other objects, two dogs: “Their Dogs are much of the Race of Spanish Dogs; a good large mungrel [*sic*] Cur, but very tame; any Man might handle them; they were gray in colour, and painted red in spots: they were very lean (...)” ([54] page 53). And in October, already in the north-central part of the Strait of Magellan, he describes an encounter with canoe aborigines, probably Kawésqar, of whom he points out: “These People have very large mungrel Dogs, much like the breed of Spanish Dogs, and are of several colours:

I did not see any other domestic Creature they have, neither could I at this time see their Boats (...) ([54] page 66). It is noteworthy that Narborough seems to discriminate “foxes” from “wild Dogs, pretty large” and from domestic dogs (“very large mungrel Dogs, much like the breed of Spanish Dogs”). But who are those wild canids?: Aboriginal *Canis* gone wild or fox-dog hybrids? Recent genomic evidence challenges the viability of the fox-dog hybrid hypothesis [11]. While our data do not conclusively determine the precise nature of individuals exhibiting wild-like morphotypes, possibilities include their being either tamed individuals of *Dusicyon* or *Lycalopex* foxes [34], or a wild-like morphotype of *Canis lupus familiaris* of pre-Hispanic origin.

In contrast to the abundance of written references, graphic records of canids are much scarcer. With the exception of Fig. 1a, b and c, which come from the end of the seventeenth century, all other visual records are from nineteenth century. That is to say –disregarding the illustrations by Froger and Duplessis–, that there are almost two centuries of absence of visual representations of canids in the historical record of Patagonia and Tierra del Fuego. It is worth asking why, despite the abundant iconography contained in narrative and cartographic sources for this long period, the presence of canids was not recorded. In their writings, Cook, Sarmiento de Gamboa, and Narborough showed some familiarity with the canids they saw around the Patagonian coasts as compared with the dogs they knew in Europe, and thus they may have been deemed unworthy of being represented visually.

Overall, there were repeated observations by European visitors about their familiarity with some of the Patagonian or Fuegian canids –in terms of physical appearance–, together with their attributed traits –that they were excellent assistants in hunting tasks such as guanaco and rhea in the case of the Aónikenk [47], or of coypus, huemules, and otters, of the Kawésqar [55]. These accounts suggest that early on, soon after the first contacts with Europeans, the aborigines may have begun to exchange and breed dogs of non-native origin, initiating an extended process of mixing between aboriginal dogs and European dogs ([43] page 387; [56] page 365).

Regarding the archaeological evidence related to the discovery of bone remains of pre-Hispanic canids in Patagonia, the few sites that confirm the presence of *C. lupus familiaris* are in northern Patagonia. These are the sites Angostura 1 (province of Río Negro) and Sierra Apas (province of Chubut), both in Argentina [57, 58]. In the southern Patagonian area, the only confirmed discovery corresponds to the GUA-010 site in the Chonos archipelago (43°–47°S) [59]. In the steppe sector

of southern Patagonia, the finds initially attributed to domestic canids –Cueva Fell and Cueva del Milodón, Magallanes Region, Chile – were ultimately identified as wild canids [57].

Finally, regarding the visual representations of the early nineteenth century, the greatest abundance of these responds to the context of the eighteenth century, that of enlightenment, dominated by the ideas of progress and the use of reason [60]. The following century was influenced by what happened after the Napoleonic Wars, characterized by the launching of scientific-naval expeditions organized by European naval powers that aimed to advance knowledge of those parts of the planet that had not been well explored. Among these, the lands and seas of the New World were major points of interest [42, 61]. Hence, the European expeditions that arose during the nineteenth century included –to achieve their multiple scientific, hydrographic, and geopolitical objectives– large teams of specialists in the most varied branches of knowledge. As Penhos ([62] page 190) refers, in these expeditions “images were decisive factors in the construction, transmission, and dissemination of scientific knowledge delivered through artistic versions of non-European spaces and their inhabitants” to such an extent that the presence of artists on these trips was almost a necessity.

Cynological perspective

Cynology is the study of matters related to canines or domestic dogs. From this perspective, the foxlike canids associated with the Aónikenk, Yahgan, and Guaicurú (and potentially the Kawésqar), were apparently widely present among the Patagonian and Fuegian peoples. This type of canid is recorded only in illustrations from 1833 and earlier years, exhibiting a morphologically homogeneous appearance with pointed snouts, small erect ears with high insertion, and a fallen and bushy tail –traits associated with a wild-like morphotype [21]. In illustrations after 1833, the canids depicted show increased morphological variation compared to the foxlike canids. Notably, the ear insertion level, shape and disposition, coat color variation, and skull types are among those traits denoting a domestication process, with more varied phenotypes when compared to wild canids [21]. The differences denoted above can be visualized in the MCA analyses, a consistent pattern either using all 61 canids, their traits, and missing values (Fig. S1) or when using only complete descriptions for 33 canids, removing missing values (Fig. 5).

The identified breed-types are all associated with hunting functions and, based on the historical narrative discussed above, were likely dogs introduced by European people. Although we do not know the phenotypic

variability of pre-Hispanic canids, our iconographic data show that the canids associated with the Patagonian and Fuegian people before 1833 exhibited a homogeneous appearance. Hence, we may speculate that the apparent replacement over time of the type of dogs associated with the Patagonian and Fuegian peoples resulted from the appeal of possessing dogs better suited for hunting tasks, as compared to the foxlike canids. Additionally, these latter canids seemed to be rather scarce –as mentioned in the historical chronicles– thus suggesting that they may have disappeared due to replacement by or hybridization with the dogs brought by Europeans in their visits to Patagonia and Tierra del Fuego. Indeed, Jaksic and Castro ([31]; see also [34]) addressed the issue of whether the Patagonian/Fuegian foxlike canids may have been the fox *Lycalopex culpaeus* tamed or domesticated by the Aónikenk/Selk’nam peoples, thus becoming their aboriginal “dog.” They discussed that the prehistoric dog was *Canis lupus familiaris* brought along ca. 9,000 years before present by the incoming aboriginal peoples after the Bering’s crossing, but that the Patagonian/Fuegian “dogs” may have been tamed foxes *Lycalopex culpaeus* or fox-dog hybrids. And that the latter were progressively replaced by the more gregarious, human-friendly, and colorful domestic dogs brought by European explorers, adventurers, colonizers, and settlers of Patagonia and Tierra del Fuego chiefly during the 1800s. The jury is still out.

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s40693-024-00129-5>.

- Supplementary Material 1.
- Supplementary Material 2.
- Supplementary Material 3.
- Supplementary Material 4.

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Authors' contributions

All coauthors designed the work, conducted the acquisition, analysis, and interpretation of data, and prepared the manuscript.

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Declarations**Ethics approval and consent to participate**

No ethical approval was required. All authors and institutions approved this participation.

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