

Osteobiographical re-individualisation of the Selk'nam human remains at the Natural History Museum Vienna

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Abstract

Osteological collections are key sources of information in providing crucial insight into the lifestyles of past populations. In this article, we conduct an osteobiographical assessment of the human remains of fourteen Selk'nam individuals, which are now housed in the Department of Anthropology, Natural History Museum Vienna, Austria. The aim is to bring these individuals closer to their communities of origin by using non-invasive methods aimed at rebuilding their biological profiles (i.e., age-at-death, biological sex and health status), adding to these with results from provenance research. This way, the human remains were assigned a new identity closer to their original one, through a process that we call 're-individualisation'. This is especially significant since it must be assumed that the individuals were exhumed against their cultural belief system. We conclude that building strong and long-lasting collaborations between Indigenous representatives and biological anthropologists has a pivotal role in research for reappraising Indigenous history.

Key words: Selk'nam, Natural History Museum Vienna, provenance research, re-individualisation, osteobiographies

Introduction

Provenance research and osteological collections

Provenance research, reconstructing the history of an object from the point of creation to its integration into a collection, is a significant part of



day-to-day tasks for museum curators. It was at first solely focused on art and historic objects. Especially after the Second World War, art looted by the Nazi regime was the subject of further investigations.¹ Only more recently, the focus of provenance research worldwide is also put into colonial contexts, especially inquiring into the origin of ethnographic and human remains collections, human remains (e.g. the Karanga Aotearoa Repatriation Programme of the Te Papa Tongarewa National Museum in New Zealand in 2003, and the Australian 'Return, Reconcile, Renew' project launched in 2020).² By reconstructing the history of human remains since their integration into the collection, the identity of the deceased person and the circumstances of their life and death can be researched. This information can then be discussed in the historical context of both the region of origin and the collection in question.³ This is important when it comes to discussing the ethicality of working with human remains collections, or repatriations of Indigenous human remains to their communities of origin.⁴

The federal state of Austria, the International Council of Museums (ICOM) Austria and the Natural History Museum in Vienna (NHMW) have not yet issued comparable programmes or guidelines in relation to the ethicality and repatriation of human remains collections, but complement the standards issued by ICOM Germany. However, some initiatives have been proposed recently. In 2021, the 'Postkoloniale Provenienzforschung' project financed by the Austrian Ministry of the Arts, Culture, the Civil Service and Sport (BMKÖS) was launched to assess colonial contexts at federal Viennese Museums, also including the NHMW. Here referred to as KolText, it aims at researching colonial influences involved in the creation of its collections, while the Department of Anthropology (DA-NHMW) focuses on selected osteological collections.

Within osteological collections, provenance research usually consists of reconstructing the osteobiography of an individual up to the point when they were received by the institution and inventoried into its collection. Several data sources are combined in this endeavour, including, but not limited to, original archival records, multidisciplinary publications and anatomical analyses. As a result, an individual's place within an institution is contextualised in terms of object handling as well as research, publications and exhibitions.

In many cases, osteological collections have resulted from the interest of biological anthropologists in studying human phenotypic variation across space and time.⁵ Overall, the large number of individuals within those museum collections was justified under methodological premises by which reliable interpretations on past lifeways and human evolution can be achieved only based on a considerable number of individuals. Therefore, a greater scientific value is usually attributed to a collection consisting of many human remains from the same origin, than to a collection consisting of an equal number of human remains but of different origins. However, attributing values to human remains as a whole is problematic, since it would mean attributing and assigning values to people.⁶

The structures and social systems within which many osteological collections were created were therefore also subject to structural violence such as colonial

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influences⁷ and prejudiced or racist assumptions, as these were historically present at the DA-NHMW. However, it is unclear if the acquisition of the remains from the collections at the DA-NHMW were always associated with traumatic events. For example, it is not clear if individuals within the Namibian collection consist of victims of a famine from 1915–16,⁸ or if all of the individuals from the New Zealand collection were directly acquired through grave robbery.⁹ This is why osteological collections are often so ethically complex,¹⁰ and provenance research at the DA-NHMW has become increasingly relevant. It is particularly delicate when collections contain bones that affect the sensitivities of contemporary people, especially when there are shared memories and possible links to their ancestors. Detaching existing inventory numbers and restoring stories and names to the individual by focusing on them rather than on the artificially created collection cannot erase history. At the same time, it is important to keep the inventory numbers, as they link to the individuals' archival documentation. Biological anthropology should support the process of provenance research and re-individualisation, as it was the science that initiated the founding of human remain collections in the first place. Therefore, researchers conducting provenance investigations should look for information and make contact with possible living communities beforehand and proceed only with their consent.

This article focuses on the osteobiographical analysis of the ancestral remains of fourteen Selk'nam individuals, previously described as hunter-gatherer groups native to Tierra del Fuego. These individuals belong to the Patagonia and Tierra del Fuego osteological collection (PTdF collection) at the DA-NHMW. Extensive provenance research has resulted in the wish of our Indigenous authors (FO, HM) to re-individualise the ancestral remains. A previous paper has focused on tracking the origin of ethnographic collections formed by Martin Gusinde, whose objects are currently housed in museums from Austria, Chile, and the Vatican.¹¹ However, to our knowledge, no studies so far have been conducted on the human remains from this region.

Within this article, re-individualisation is understood as an in-depth study aiming at compiling interdisciplinary biographical information based on the analysis of skeletal remains (bioanthropology) and the associated archival information on the history of an individual that is part of a museum collection, in order to reconstruct (part of) their identity (provenance research).¹² In forensic sciences, individualisation refers to gathering enough information on human skeletal remains in order to identify them as belonging to a certain individual from a pool of suspected victims.¹³ This approach is applied in the context of mass grave studies.¹⁴ In a historical context like that of museum collections, the quantity of reconstructed details is limited, due to various reasons (e.g. not having photographs and names of missing persons). Therefore, we combine techniques of bioanthropology with those of provenance research to obtain results that will complement each other. Additionally, through the creation of this osteobiography, the individuals will be considered as individuals beyond the collection: they will be re-individualised and are brought closer to the living communities.

Tierra del Fuego and the Selk'nam people

The Indigenous Fuegian groups were Native Americans living in the region known as Tierra del Fuego located in southern Patagonia. This was the last continental landmass to be occupied by humans, sometime between 17,000–14,000 years before present (BP),¹⁵ with solid archaeological evidence for the human occupation dating back to ~10,000–7,000 years BP. At the southern edge of South America lies the archipelago of Tierra del Fuego, which has been inhabited by five native groups (Figure 1): the Kawésqar, Selk'nam, Haush, Tehuelche and Yaghan. Early explorers and ethnographers have depicted them as fishing and hunter-gather groups, characterised by a non-sedentary lifestyle. The Selk'nam inhabited the Isla Grande, the biggest island in Tierra del Fuego. They were decimated to less than 800 individuals in 1916, due to a genocide marked by violent disputes with European farmers and bounty hunters, as well as diseases introduced by colonisers.¹⁶ There are native communities today in Argentina as well as Chile. In Chile, the Selk'nam, in contrast to other Fuegian groups such as the Yaghan and Kawésqar, and represented by the authors FO and HM (Corporación Selk'nam Chile), have not yet been recognised by the government.¹⁷

One of the first observations about the Fuegians was made by Charles Darwin aboard the HMS *Beagle* in 1832.¹⁸ He described them as 'savages' and imposed a stereotype that persisted through time – the Fuegians representing the early stages of what he assumed to be a linear way of evolution.¹⁹ Amid these early encounters, the Austrian anthropologist and ethnographer Martin Gusinde (1886–1969) was the first to conduct extensive research about the Fuegians, including the collection of linguistic, ethnographic and bio-anthropological data as well as photographic analyses in the early to middle 1900s.²⁰ Another relevant ethnographic work was conducted by the French-American anthropologist Anne Chapman, who spent long seasons in Tierra del Fuego. Among the extensive ethnographic literature on the Fuegians, the burial tradition is relevant for this article.²¹ The Selk'nam people consider death as a part of life, and thus they do not see any reason or need to create cemeteries. The concept itself of burying their dead in a designated space was foreign to them.²² Within their cultural tradition, when someone of the community died, the *harwen* (clan, family) would be tasked with starting a large fire, followed by a series of laments, songs and dances in honour of the deceased. A small group would then prepare the body for burial, tying it to sticks with guanaco or seal leather and wrapping it in the deceased's old guanaco cape. Everything had to be done quickly; if the death occurred during the night, the burial had to be the next morning. If it occurred during the day, the family prepared the body after spreading the word and grieving all together. The burial itself consists of a shallow hole, dug with sticks and sharp stones, and the body is covered with sand, branches and rocks.²³ Oral history also mentions burials in trees. Here, the body was hidden in a hollow trunk, or in the roots of a fallen tree. The exact position of the burial was known only by the small group that had buried the body.²⁴ It had to be covered perfectly, so that no accidental bystanders would suspect of the existence of the grave. In general, no grave goods were placed within the burials.



Figure 1 Physical map of Tierra del Fuego with the geographic distributions of the native groups.

Sources: Created and modified after research by N. Nakatsuka et al., 'Ancient Genomes in South Patagonia Reveal Population Movements Associated with Technological Shifts and Geography', *Nature Communications*, 11:1 (2020), 3868, doi: 10.1038/s41467-020-17656-w, with QGIS using the Natural Earth Starter Package.

Ethical statement

The content and subject of this article are ancestral remains of the Indigenous Selk'nam from Tierra del Fuego. The remains are cared for in the store of the DA-NHMW. Researchers (CS, MB, LM, SE) have worked closely with some Selk'nam representatives of the Chilean Covadonga Ona community (FO, HM), with all research and analyses agreed on in advance. No further ethical approval was sought. The human remains were analysed in a closed examination room and separately cared for in one of the authors' offices when not actively studied, and immediately returned to the Department's store after the analysis was completed. During the whole examination process, the human remains were touched only by the authors CS, LM and SE. No photographs of the human remains were taken, to ensure the protection of the spiritual identity of the ancestral remains, and so as not to further disturb them. Seeing bones means seeing them resting in a (burial) place, something that one is not supposed to know, according to the Selk'nam belief system expressed by the Covadonga Ona community.

As some of the Selk'nam human remains from the PTdF collection possibly originate from Argentina, the authors would like to stress that the views mentioned in this article are these of the Covadonga Ona community of Chile. We authors call for caution, since these interpretations might not necessarily be shared by other Selk'nam communities (e.g., Comunidad Indígena Rafaela Ishton). In general, we would like to stress that contacts and dialogue with other Fuegian groups are sought so as to enable broader conversations about the PTdF collection.

Human remains collection and methods

The Fuegian collection at the DA-NHMW

In total, the DA-NHMW houses an osteological collection encompassing the skeletal remains of twenty-five individuals from the region of Patagonia and Tierra del Fuego (Table 1). It is composed of cranial and postcranial elements, three casts, two busts and seven hair samples. It includes collections of Selk'nam, Kawésqar and Yaghan as well as skeletal remains with a possible Tehuelche heritage and one from Rapa Nui. We verified the individuals' inventory numbers by comparing the inventory numbers in the Inventory Catalogue to those painted on to the bone surface. The crania (skulls with mandible) and calvaria (skulls without mandible) filed under the inventory numbers are here referred to as skeletal or ancestral remains and not as 'ancestors' or 'individuals'. The Indigenous authors of this article would understand ancestors to mean the preserved complete bodies of deceased persons and not the bones, i.e. skeletal remains.

The collectors of the PTdF collection at the DA-NHMW are Martin Gusinde and Robert Lehmann-Nitsche, ethnographers and anthropologists who owe their scientific careers mainly to the study of the cultures of Tierra del Fuego and Patagonia. Martin Gusinde (1886–1969), born in Breslau, Germany, was a member of the Catholic mission order *Societas Verbi Divini* (SVD).²⁵ Robert Lehmann-Nitsche (1872–1938) was a German doctor and anthropologist who became one of the pioneers of anthropology in Argentina.²⁶ In relation to the acquisition of human

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Table 1 Inventory numbers of all entries for Selk'nam osteological human remains from the DA-NHMW

<i>Inventory number: DA-NHMW</i>	<i>Inventory number: Other</i>	<i>Associated collector</i>	<i>Ethnic affiliation, by collector</i>	<i>Preservation status</i>
6035	GUS 6	Martin Gusinde	Selk'nam	Cranium
6036	GUS 11	Martin Gusinde	Selk'nam	Cranium
6037	GUS 7	Martin Gusinde	Selk'nam	Calvarium
6038	GUS 9	Martin Gusinde	Selk'nam	Cranium
6039	GUS 10	Martin Gusinde	Selk'nam	Cranium
6040	GUS 4	Martin Gusinde	Selk'nam	Cranium
6041	GUS 8	Martin Gusinde	Selk'nam	Cranium
6042	GUS 5	Martin Gusinde	Selk'nam	Cranium
6043	GUS 15	Martin Gusinde	Selk'nam	Calvarium
15357	L-N3	Robert Lehmann-Nitsche	Selk'nam	Cranium
15358	L-N2	Robert Lehmann-Nitsche	Selk'nam	Cranium
15359	L-N1	Robert Lehmann-Nitsche	Selk'nam	Cranium
15360	L-N4	Robert Lehmann-Nitsche	Selk'nam	Calvarium
21462	GUS 99	Martin Gusinde	Selk'nam	Cranium

remains, the DA-NHMW has either directly bought or received as donations the skeletal remains from Patagonia and Tierra del Fuego through one of them. During Gusinde's and Lehmann-Nitsche's time, the Fuegian hunter-gatherers' lifestyle was considered to be unfeasible by the European colonists, who soon declared them as 'extinct' – making the claim of the Fuegian land for the colonists' cattle an easy matter.²⁷

Selk'nam human remains collection

In this article we focus solely on the analysis of the Selk'nam ancestral human remains of the DA-NHMW (Table 1). From the PTdF collection, fourteen of the twenty-five human remains can be identified as Selk'nam based on information provided in the Inventory Catalogue. Nevertheless, this identification must be treated with caution, as the remains' alleged ethnic affiliation was assigned by the European collectors, was recorded in the DA-NHMW's Inventory Catalogue by European curators and was neither recorded elsewhere nor confirmed by members of the Indigenous communities. In the osteological collection of the PTdF collection, the Selk'nam ancestral human remains are represented and preserved as either crania or calvarium. No post-cranial elements of Selk'nam heritage are present in the collection.

Methods

Within the framework of this article, re-individualisation is used to describe the multiple sources of information associated to the individuals of a collection. This is carried out by gathering archival information as well as conducting non-invasive bio-anthropological analysis of the ancestral Selk'nam remains. It is through such an approach that an osteobiography²⁸ is created for each of them. By focusing on

an individual level, osteobiographies have been shown to provide valuable insights into the life of the individual from a cultural perspective,²⁹ or when and from where they originated in colonial contexts.³⁰

Data collection

During the process of data collection, the skeletal remains were handled by three of the authors (CS, LM, SE). It was the explicit wish of the Indigenous authors (FO, HM) to keep the number of people accessing the remains as low as possible, as it represents an intrusion into the spirituality of the skeletal remains. The methods applied in the present study are non-invasive, well-established in the field and consist of estimation of sex³¹ and age-at-death,³² an examination for bone changes related to pathologies, as well as a taphonomic evaluation.³³ This was carried out with special attention to possible burial and also to curatorial processes that the skeletal remains were known to have been subjected to. We finish by discussing what these osteobiographies could mean for today's Selk'nam communities.

Estimations of sex and age-at-death

In contrast to the socially constructed concept of gender, sex is the 'anatomical or chromosomal categorie[s] of male and female'.³⁴ Globally, females tend to have more gracile (cranial) features in comparison to males from the same population. The human populations in Tierra del Fuego and southern Patagonia are known for their general robust cranial characteristics, which is probably the result of an adaptation to the harsh climate.³⁵ This may lead researchers unfamiliar with this morphology to an overestimation of male individuals. After carefully examining the individuals for their own distinctive morphology, the standards outlined by Buikstra and Ubelaker³⁶ were applied for estimating the sex of each individual together with the method proposed by Ferembach.³⁷

Age-at-death (AAD) is an estimation for the individual's reached age at the point of death. Especially in adults, it is more reliable when provided in age ranges instead of specific years.³⁸ Several osteological features associated with growth, development and overall age-related changes can be used to estimate AAD. One of the more prominent methods used for AAD estimations on the skull is based on examining the closure of cranial sutures. The method used by Meindl and Lovejoy³⁹ was applied to estimate the AAD of the human remains by carefully inspecting the cranial sutures.

Bone changes related to pathologies

Bone changes of pathological aetiology were macroscopically observed. This included porotic hyperostosis (PH) and ectocranial porosis (EP),⁴⁰ cribra orbitalia,⁴¹ as well as dental enamel defects.⁴² Both PH and EP manifest as pitting in the bone surface, but only PH is accompanied by thickening of the bone.⁴³ Oral pathologies analysed included the presence of caries⁴⁴ and periapical diseases⁴⁵ that can result in ante mortem tooth loss, which was also recorded. Additionally, it was observed if abnormal bone, neoplastic reactions and temporomandibular joint diseases⁴⁶ were present. Physiological stress markers or pathological changes were scored as absent or present for each individual. Since the collection does not

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allow for statistically meaningful analyses, due to its small size ($n = 14$), no more nuanced scores were applied.

Taphonomy

Taphonomic processes are the result of 'the cultural events, natural processes, and environmental agents that modify human remains from the time of death until the time of analysis'.⁴⁷ They can therefore help to reconstruct the past mortuary and burial practices as well as factors influencing the state of preservation during curatorial and museological practices. It was analysed which extrinsic biological and physical factors had left traces on the human remains, such as possible characteristics of the soil where the remains were buried, weathering and the bite marks of scavengers. Weathering, the abrasion of bone, was recorded according to Behrensmeyer,⁴⁸ using a six-point scale to evaluate if an individual had been exposed to heat, drought or humidity. The staining of the bone was classified after suggestions made by Dupras and Schultz,⁴⁹ while the colouring of the bone itself was recorded according to a self-made colour code (white, ivory, grey, yellow to brown, yellow to tan, tan to dark brown), to evaluate if individuals had been buried under similar soil conditions.

Complementarily, any traces of activities that happened after the skeletal remains were incorporated into the DA-NHMW have been recorded as 'curation modifications and scientific use'. If notes or additional annotations were present in the trays (*Schädeltassen*) where the crania are individually stored, pictures were taken of those notes.

Results

In this section, we present the results of the bioarchaeological and taphonomic analyses as well as provenance research for the Selk'nam skeletal remains at the DA-NHMW. The results of the pathological findings as well as the geographic origin based on the Inventory Catalogue and Gusinde's monograph are presented individually. Pictures were not taken during the process of analysis and none are shown here, to protect individuals' spiritual identity.

Bioanthropology

Summary of the biological reports

The estimations for AAD and sex showed that most of the ancestral remains are male ($n = 10$) and belong to individuals who died when they were between 35- and 50 years old, or as middle adults ($n = 12$) (Table 2).

At least one stress marker that we studied (i.e., cribra orbitalia, dental enamel defects, porotic hyperostosis (PH) and ectocranial porosis (EP)) was observed in ten of the fourteen remains analysed (Table 3). The most common stress marker was PH ($n = 7$), followed by four cases of both EP and dental enamel defects and one case of cribra orbitalia.

The most common observed oral pathological change were periapical lesions (overall count $n = 31$), observed in eight ancestral remains. They are mainly caused by carious lesions, periodontal disease or severe dental wear and may lead to

Table 2 Estimations for age-at-death and sex for the Selk'nam remains stored at the DA-NHWW

<i>Estimation: age-at-death^a</i>	<i>Total Selk'nam (n = 14)</i>
Young adult (20–34 years)	0
Middle adult (35–50 years)	12
Old adult (50+ years)	2
<hr/>	
<i>Estimation: sex^b</i>	
Male	10
Female	2
Indeterminate sex	2

Notes: ^aJ. Buikstra and D. Ubelaker, *Standards for Data Collection from Human Skeletal Remains* (Arkansas, 1994).

^bD. Ferembach, I. Schwidetzky and M. Stloukal, 'Empfehlungen für die Alters- und Geschlechtsdiagnose am Skelett', *HOMO*, 30 (1979), 1–32.

ante-mortem tooth loss (AMTL). One individual suffered from as many as twelve periapical lesions. Periodontal disease was observed in eleven cases, with a range of one to twelve lesions per individual (overall count $n = 54$). Dental caries were observed in one case (Inv.-Nr. 6038) on the occlusal surface of the lower right second molar. A benign neoplastic reaction, also known as a 'button osteomata', was observed in one case (Inv.-Nr. 15357). At 1.0 cm in width, it was shown to be slightly raised and shows a contrasting white colour, and comparable smaller structures are present near the left mastoid process with a maximum width of 0.5 cm. A square bony projection on the left side of the frontal, beside the suture to the zygomatic bone, measuring 0.7 cm in length and 0.3 cm in width, was observed in one individual (Inv.-Nr. 15358). Bony projections are not considered to be pathological, and there is no indication that this was caused by trauma.

Osteoarthritis of the temporomandibular joint was observed in seven cases. An area of 1.5 cm² of chipped woven bone was observed in one case (Inv.-Nr. 21462). Cribra orbitalia was the least commonly observed lesion, with only one ancestral remain affected (Inv.-Nr. 6043). Nine cases of PH were observed, with one showing signs of healing (Inv.-Nr. 6034). For EP, none of the four cases showed signs without any evidence of healing. This makes for an overlapping in the presence of PH and EP in two cases. Only one individual showed evidence of trauma. A healed blunt-force wound was observed on the right parietal of Inv.-Nr. 6043. This depression fracture was broken post-mortem, as the colour change and the morphology from the inside suggests. It accounts for at least two blows, but it is not clear which happened first, because of an overlapping lining of both fractures (*Puppe* Rule).

Biological report per individual

To re-individualise the ancestral remains, the results from the estimation of sex, AAD and pathological analysis were summarised (Table 3).

Table 3 Individualised bioarchaeological assessment of the ancestral remains of the Selk'nam collection at the DA-NHMW

<i>Inventory number</i>	<i>Estimation: sex</i>	<i>Estimation: age-at-death</i>	<i>Cribrata orbitalia</i>	<i>Porotic hyperostosis (PH)</i>	<i>Ectocranial porosis (EP)</i>	<i>Inflammation</i>	<i>New bone formation</i>	<i>Oral pathologies and lesions* (n)</i>	<i>Other</i>
6035	Undetermined	Middle-aged adult	No	No	No	No	No	Periapical lesion (1), periodontal disease (12)	No
6036	Male	Middle-aged adult	No	Yes	Yes	Yes; osteoarthritis of the temporomandibular joint	No	Ante-mortem tooth loss (12), periapical lesions (12), periodontal disease (9)	No
6037	Male	Middle-aged adult	No	No	No	Yes; osteoarthritis of the temporomandibular joint	No	Ante-mortem tooth loss (6), periapical lesions (4) resulting in ante-mortem tooth loss	No
6038	Male	Middle-aged adult	No	No	No	Yes; osteoarthritis of the temporomandibular joint	No	Caries (1), periodontal disease (5), dental enamel defects (2)	No
6039	Male	Middle-aged adult	No	No	No	No	No	Ante-mortem tooth loss (2), periodontal disease (2)	No
6040	Undetermined	Middle-aged adult	No	No	No	No	No	Periodontal disease (3), dental enamel defects (1)	No
6041	Male	Middle-aged adult	No	Yes	No	No	No	Ante-mortem tooth loss (1), dental enamel defects (10), periodontal disease (1)	No
6042	Male	Middle-aged adult	No	Yes	Yes	Yes; osteoarthritis of the temporomandibular joint	No	Ante-mortem tooth loss (1), periapical lesion (1), periodontal disease (2). No observation possible on 9 of 32 alveolar sockets.	No

Table 3 Continued

<i>Inventory number</i>	<i>Estimation: sex</i>	<i>Estimation: age-at-death</i>	<i>Cribra orbitalia</i>	<i>Porotic hyperostosis (PH)</i>	<i>Ectocranial porosis (EP)</i>	<i>Inflammation</i>	<i>New bone formation</i>	<i>Oral pathologies and lesions^a (n)</i>	<i>Other</i>
6043	Female	Middle-aged adult	Yes	No	Yes	No	No	Ante-mortem tooth loss (2). No observation possible on 7 of 16 sockets.	Yes; a healed blunt-force trauma was observed on the right parietal
15357	Male	Old adult	No	Yes	No	Yes; osteoarthritis of the temporomandibular joint	No	Ante-mortem tooth loss (6), periapical lesion (3), periodontal disease (1).	Yes; button osteomata
15358	Male	Middle-aged adult	No	Yes	Yes	No	Yes	Periapical lesion (1), periodontal disease (5)	Square bony projection on the left frontal bone, measuring 0.7 cm in width × 0.3 cm in breadth
15359	Male	Middle-aged adult	No	No	No	Yes; osteoarthritis of the temporomandibular joint	No	Periapical lesion (3)	Yes
15360	Female	Old adult	No	Yes	No	Yes; osteoarthritis	No	Ante-mortem tooth loss (3), periapical lesion (6), periodontal disease (3)	No
21462	Male	Middle-aged adult	No	Yes	No	Yes; osteoarthritis of the temporomandibular joint	No	Periodontal disease (11), dental enamel defects (2)	Unclear; lytic lesion or taphonomic lesion. A patch of woven bone, 1.5 cm ² on the left side of the protuberantia mandibulae

Note: ^aWhile ante-mortem tooth loss is not an oral pathology, it was recorded as an oral lesion, as it is often caused by periodontal disease or other oral infections.

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Table 4 Results for the weathering stage and bone colouring for the 14 Selk'nam ancestral remains of the Patagonia and Tierra del Fuego collection at the DA-NHMW

Colour coding	Weathering stage after Behrensmeier ^a					
	0	1	2	3	4	5
Grey	15357					
	15358					
	15359					
	15360					
Tan to dark brown	6037		6036	6039	6035	
			6038	6040	6041	
				6042		
Yellow to tan Ivory			6043			
			21462			

Note: ^aA. K. Behrensmeier, 'Taphonomic and Ecologic Information from Bone Weathering', *Paleobiology*, 4:2 (1978), 150–62.

Taphonomy

Bone colour may be affected by external factors, for example soil composition.⁵⁰ Therefore, some conclusions about the possible origin can be drawn. However, due to the remains being exhumed such a long time ago, and having been exposed to so many environmental constraints, any interpretation of taphonomical changes needs to be discussed after placing the remains into a broader context. However, if remains provenanced as from a given location present the same weathering stage and colour, this suggests that they were subjected to similar environmental conditions, indirectly corroborating a shared provenance. This was observed for five contexts, involving almost all individuals of the collection, corroborating provenance research (Table 4). From these, four ancestral remains from a battlefield in Isla Grande showed the same weathering stage and colour (Inv.-Nr. 15357–15360). Two crania excavated from a cemetery in Isla Dawson also showed the same weathering and colour (Inv.-Nr. 6035, 6041). Among at least three remains gathered from beaches (Inv.-Nr. 6036, 6040, 6043), two show the same colour coding, but differ in bone weathering stage.

On the bone surface, nine of the fourteen crania and calvaria showed scratches and/or abrasion. Remnants of roots or rootlets in the nasal cavity or endocranium were observed in four cases (Inv.-Nr. 6035, 6040–6042), two of them exhibiting signs of plant root damage on the bony surface (Inv.-Nr. 6041, 6042).

Conservation and restoration changes

All skeletal remains have inscriptions in German marked in black or red ink or graphite pencil on their surface. The inscriptions mention the alleged tribal affiliation and – in some cases – the geographic origin of the individual (Table 5). For these, the information always correlates with the information present in the

Table 5 German inscriptions on the bone surfaces and their translation for the Selk'nam ancestral remains of the Patagonia and Tierra del Fuego collection at the DA-NHMMW

Inventory number	Location and inscription		Mandible
	Calvarium		
6035	Left parietal	6035; <i>Ona; Feuerland-Indianer</i>	Right ramus Left ramus 6035 <i>Ona; G.6</i>
6036	Left parietal	6036; <i>Ona; Feuerland-Indianer</i>	Right ramus Left ramus <i>Ona; G.11</i> 6036
6037	Left parietal	<i>Ona; G.7; 6037; Ona; Tierra del Fuego; leg[at] Martin Gusinde; 1921</i>	Right ramus Left ramus None
6038	Right temporal	6038; <i>Ona; (Feuerland-Indianer)</i>	Right ramus Left ramus <i>Ona; G.9</i> 6038
6039	Left parietal	<i>Ona G.9</i> 6039; <i>Ona; (Feuerland-Indianer)</i>	Right ramus Left ramus <i>Ona; G.10</i> 6039
6040	Right temporal	<i>Ona; G.4</i> 6040; <i>Ona</i>	Right ramus Left ramus <i>Ona; G.4</i> 6040
6041	Right temporal	<i>Ona; G.8</i> A	Right ramus Left ramus <i>Ona; G.8</i> 6041
6042	Left parietal	6041; <i>Ona</i> <i>Ona; G.5</i>	Right ramus Left ramus <i>Ona; G.5</i> 6042
6043	Right temporal	6042 <i>Ona</i> <i>Ona; G.15</i> 6043	Right ramus Left ramus None
	Left parietal	Two squares are marked with pencil on to the left mastoid process, looking like a squared 8.	Right ramus Left ramus None
15357	Left temporal	<i>Lago Musters; Chubut</i>	Right ramus
	Left parietal	15357	Left ramus <i>15357; Lehmann-Nitsche; 5</i>

Table 5 Continued

Location and inscription		Mandible
Inventory number	Calvarium	
15358	<p>Left temporal</p> <p><i>Ona; von einem Kampfplatz im nordöstl. Innern Feuerlands; Reise Lehmann-Nitsche; 26.03.1902; 357</i></p> <p>Left temporal</p> <p><i>15358; Ona.; von einem Kampfplatz; im nordöstl. Innern; Feuerlands; Reise Lehmann-Nitsche; 26.03.1902; 2</i></p>	<p>Ona; from a battlefield in the inner north-east of Tierra del Fuego; Travels Lehmann-Nitsche; 26.03.1902; 357</p> <p>15358; Ona.; from a battlefield in the inner north-east of Tierra del Fuego; Travels Lehmann-Nitsche; 26.03.1902; 2</p> <p>Left ramus</p> <p>15358; <i>Lehmann-Nitsche; 2</i></p>
15359	<p>Left parietal</p> <p><i>15359; Ona.; von einem Kampfplatz in nordöstl. Innern Feuerlands; Reise Lehmann-Nitsche; 26.03.1902; 1</i></p>	<p>Left ramus</p> <p>15359; <i>Lehmann-Nitsche; 1</i></p>
15360	<p>Left parietal</p> <p>15360</p> <p>Left temporal</p> <p><i>Ona.; von einem Kampfplatz; im nordöstl. Innern Feuerlands; Reise Lehmann-Nitsche; 26.3.1902; 4</i></p>	<p>None</p> <p>Ona.; from a battlefield in the inner north-east of Tierra del Fuego; Travels Lehmann-Nitsche; 26.03.1902; 1</p>
21462	<p>Left parietal</p> <p><i>G10; 21.462; Selknam; Isla Grande</i></p>	<p>Right corpus, inside</p> <p>21.462</p> <p>Left ramus</p> <p><i>G10</i></p>

Inventory Catalogue. Detailed information about the collector and the year of acquisition is also sometimes provided.

Five skeletal remains had a preservative coat of an undocumented substance applied to their surface. Eleven skeletal remains had notes in the *Schädeltasse* documenting sampling processes or loaning them to exhibitions at the NHMW and elsewhere. Three of the Selk'nam skeletal remains, none of them showing signs of the coating but having the corresponding note, were sampled for ancient DNA (aDNA) in 2015, but the results have not been published yet.

Discussion

This article has aimed at reconstructing osteobiographies of Selk'nam ancestral remains from the DA-NHMW by combining methods from biological anthropology and provenance research in order to re-individualise them. By doing so, we intended to detach them from the collection and bring them closer to today's Selk'nam communities. However, the analysis performed presented many limitations. First, the human remains were represented only by their cranial elements, including mandibles and teeth. Second, the archival information is biased by the way in which data was handled and deemed relevant to record in the past. We will first discuss the results from the bioarchaeological perspective, and then focus on the social implications of our study.

Among the oral health variables studied, caries was found in one case, an expected low number which was also observed in similar populations for this region.⁵¹ Caries are caused by the interaction of bacteria with sucrose and starch, and are a disease usually associated with agricultural societies.⁵²

Two Selk'nam skeletal remains were originally buried in the cemetery of the Catholic missionary station of Isla Dawson, San Rafael. They showed moderate dental health with moderate dental abrasion, barely any calculus, some periodontal disease, but only one periapical lesion. The absence of dental calculus might also be due to curatorial processes: a box containing thirteen single teeth that was linked to the PTdF collection showed calculus to be present in advanced stages. Previous research on individuals living in missions in Tierra del Fuego found indicators for high metabolic stress,⁵³ something that was not observed in the two Selk'nam skeletal remains from the cemetery in San Rafael.

The inscriptions on the skeletal remains (see Table 5) reflect the remains' history as museum objects. Information relevant to the collection was applied directly, and is clearly visible on the remains. This is no longer done today for various conservation, ethical and scientific reasons. The ancestral remains have been kept in the same store since they were acquired through donation and purchase in the 1930s by the DA-NHMW. However, it is unclear what external influences they were exposed to after their exhumation and prior to their acquisition by the DA-NHMW. Therefore, the taphonomic studies carried out and described here have to be treated with caution and under consideration of other present evidence.

The combination of four ancestral remains showing rootlets in their nasal cavity and their historic provenance supports Martin Gusinde's statement that he

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excavated these Selk'nam ancestral remains from their burial. Two of them were excavated from the cemetery of the abandoned mission of San Rafael on Isla Dawson between 1 and 15 January 1919. This taphonomic evidence is not present for the four ancestral remains originating from an unknown battlefield in north-east Isla Grande. Therefore, the statement by Robert Lehmann-Nitsche that he excavated the remains himself must be relied on.⁵⁴

A cemetery, and also a human remains museum collection, is an antagonist to Selk'nam funeral habits, where only few people knew the exact location of the body. By burying them in a graveyard, a dedicated place for burials, cultural beliefs were uprooted and ignored. Another important part of Selk'nam death culture is the need to leave the ancestors alone and resting undisturbed. Therefore, the existence of the fourteen human remains in the DA-NHWM leaves the representatives of the Selk'nam Covadonga Ona community feeling powerless and restless in these two respects. The ancestors are not resting in their homeland but stored in a museum depot, which is against the tradition that the body needs to be buried immediately. It is also why re-individualisation is not an uncomplicated process. However, re-individualisation in a historical context was deemed appropriate here, as it can mark a new beginning: with the analyses presented here, it gives the scattered community a part of themselves back and allows insight into the past history of Selk'nam communities. The Selk'nam Covadonga Ona community is divided on the matter of how to deal with the knowledge of the ancestral remains at the DA-NHM, and states while they should not be disturbed, they cannot be considered as complete, both because lacking appropriate burial and because some parts of the skeleton are missing. While open questions about the exact burial and excavation circumstances cannot be clarified with bioanthropology, the Covadonga Ona community has this part of the story in their oral history.

As mentioned before, at least two more osteological collections stored at the DA-NHWM originated from colonial backgrounds in Tierra del Fuego and Patagonia, and with at least questionable research practices.⁵⁵ The Selk'nam collection echoes these provenances, and demonstrates the inevitable need for re-evaluations and reassessments of these collections. As a result of provenance research and while there are currently no official requests for repatriation, the PTdF collection remains closed for research, with an exception for interested communities of origin.

Conclusion

The proposal to re-individualise museum objects has been made by Benedicte Savoy.⁵⁶ However, osteological collections have also been re-individualised with a focus on provenance.⁵⁷ This article is the first time that a combined approach of bioanthropology and provenance has been applied to a collection at the DA-NHWM in close collaboration with a native community. The methods used herein are widely established and applicable by well-trained bioanthropologists. Therefore, it would be fruitful if more researchers would take up this task together with representatives of Indigenous communities. For centuries, scientists have conducted research without necessarily having in mind the consequences and

implications of their actions on society and future research. This includes the often not legally allowed excavation of human remains and transporting them to different countries, such as Austria. Today both the Indigenous and scientific communities have the opportunity to change this paradigm. A first step is to collaborate to establish boundaries on what should not be done with ancestors' remains, and how a respectful discourse and attitude can be found instead. At the beginning stages of research for this article, the Indigenous authors (FO, HM) were cautious regarding the storing and handling of the ancestral remains. Their requests and concerns were taken seriously, and this opened up a new understanding to science in the DA-NHMW and the possibilities it could have for the Selk'nam communities. In particular, the creation of osteobiographies was perceived as part of a dignifying action in giving back individual (life) stories to the ancestral remains. Because little written historical information is recorded, it was crucial to include the ancestral remains in the analysis. Therefore, re-individualisation is a first step that will bring both pain and peace: pain to the living community by remembering but also learning about the past, and peace to the ancestral remains, which will be finally reunited with their identities.

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