

## MUMMIFICATION IN THE ANCIENT AND NEW WORLD

### MUMIFIKACIJA U STAROM I NOVOM SVIJETU

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*In memoriam of Dr. Guillermo Zanniello, expert support and qualified guide in my medicine works*

#### SUMMARY

*In the Ancient and New World there was a custom to preserve the corpse in a natural and artificial way. Since Paleolithic man believed in an afterlife and even in Mesoamerica and the Andes cultures, care and ceremony were practiced to the burial of the dead in an ancestral cult. Mortuary rituals were developed in Pre-dynastic Egypt (4500-3100 BC) but apparently they had begun before in America, c. 5000 BC.*

*Mummies served for assisting the soul to survive and for preventing the dead from frightening the livings. Incas arrived at a point of perfection in these practices after other Andean cultures but we should not forget their older predecessors, the Chinchorro culture on the arid coast of the Atacama Desert. Different steps in the technique can be distinguished in both worlds: natural desiccation covered by animal skins, methods to protect the body skin and flesh removal, replacement with clay; black, red or mud-coated corpses, evisceration, body cavity treatment, cleansing and anointing the interior, brain removal, mummified bodies, corpses covered with natron, before being washed and bandaged or wrapped.*

*It will be necessary to carefully check dates, techniques and periods in the two zones to establish exactly the evolution of the methods applied.*

**Key words:** *Mummification; ancient and new world; methods and first intentional technique*

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## INTRODUCTION

The Ancient and New World are full of examples of burial customs, preserving the dead in a natural or artificial form. Although mummified human remains have been found in almost all continents, especially in six principal regions, few people introduced this technique responding to religious purposes, ancestral cult or a belief in the dead powers.<sup>1</sup> In the New World, we can mention the Andean cultures in the Pre-Hispanic America, Aleut people near Alaska,<sup>2</sup> in the North Pacific Ocean,<sup>3</sup> including Torres Strait Islander groups of the coastal areas of north-east Australia,<sup>4</sup> and in the Ancient World the Egyptians in Africa and certain Buddhist priests of Japan in Asia<sup>5</sup>. Mummies have been classified as accidental, (as a result of natural circumstances, such as heat, cold or chemical soil composition), in-

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<sup>1</sup> J. LOWENSTEIN, "Paleodermatosis: lessons learned from mummies", New York, *American Academy of Dermatology*, June 2004, p. 919-936.

<sup>2</sup> The Aleut people, living in the Aleutian Islands off the Alaska coast, called themselves Unangan, preserved their dead like the Chinchorro. They performed autopsies and studied the human and animal anatomy comparatively. After evisceration, the central cavity was stuffed with dried grass. They next put the body into a running stream to dissolve the fat, leaving merely muscle and skin, tied in a flexed position, the corpse was dried by exposing to the air for a long period or occasionally to fire. During this process his spirit could be 'sealed in' to a family member's body. Once completed the drying, the deceased was wrapped in fur, mats or bird skins to rest in a wooden or rock shelf-like platform inside a cave. They believed that dead's powers continued and could be exploited by the livings to give advice and aid in hunting and fishing and to protect from enemies. His finger or other small parts as protective talismans on hunts guaranteed safety and success.

<sup>3</sup> M. ZIMMERMAN, "Alaska and Aleutian mummies", in A. COCKBURN, E. COCKBURN, T. REYMAN (ed.), *Mummies, diseases and ancient cultures*, Cambridge, Cambridge University Press, 1998, Part II, chap. 8, p. 138-153.

<sup>4</sup> For example, a group of Torres Strait Islanders recognised as Australian Aboriginal, tied a corpse into a sitting position and left it outdoors until dried by sun or they placed it on raised platforms with fire bellow. Skin and entrails would be removed and the internal cavity would be filled with natural fibers. Then the body was "latched to a rectangular wooden framework and hung up to dry behind a grass screen", (G. PRETTY, A. CALDER, "Mummification in Australia and Melanesia" in A. COCKBURN, E. COCKBURN, T. REYMAN (ed.), *op.cit.*, p. 289-307, p. 290). After several months, the body, painted in red ochre, was decorated with seashell eyes, grass and seeds. Once completed this process, the decorated mummy "on its frame" would be hung in the surviving spouse's house until it finally crumbled.

<sup>5</sup> In Japan, except for 19 mummies of the Fujiwara clan from the 12th century, certain Buddhist priests known as *Sokushinbutsu* practised self-mummification between around 774 until the 20<sup>th</sup> century. The monk gradually reduced their intake over a long period of time to reduce fat and by vomiting they expelled the body's fluids and repel maggots and other parasites. The last few years of life he became a walking skeleton and he was then buried alive for three years until dehydration and starvation provoked his death caused by ascetism, in order to alleviate the suffering of people. Interred in an underground stone chamber, it was exhumed to see if the body had been successfully mummified. In this case, he has reached enlightenment and would be able to be resurrected when Buddha returned. If not, they were immediately reburied. According to Buddhist tradition, Maitreya, the successor of Sakyamuni Buddha, would come to this world 5, 670, 000, 000 years after

tentional (preservation by enhancing natural process) or artificial (embalming or emersion in preservative fluids). Lynnerup simplified this classification in two groups: natural (natural influence results) and artificial (induced by active human intervention), adding some burial rites that involved both.<sup>6</sup> Nowadays, accidental mummification occurs due to the isolation of bodies in undisturbed dry places such as cisterns or in domestic settings, a common marker of the changing conditions of social life.<sup>7</sup> In this paper, we will only study two of these cultures, the Andean tradition, especially Chinchorro, and the Egyptian position in order to determine where this intentional technique took place first.

Since Paleolithic, man buried the dead according to elaborate conventions as an ancestral cult and even in Mesoamerica and the Andean cultures, evidence of belief in the afterlife appears. In Predynastic Egypt (4500-3100 BC), funerary customs were practised but apparently they had begun before in America, c. 5000 BC. We can also compare the cultivation extent in order to have an idea of the different processes in both worlds.

In the case of agriculture, at the end of the Pleistocene, (c. 9500 BC) mixed foraging and cultivation strategies appeared in the Old World in the so-called Fertile Crescent.<sup>8</sup> But during the next pre-Pottery Neolithic, agro-pastoralism had replaced hunting and gathering through much of the Fertile Crescent (c. 9000-8000 BC). Sowing and harvesting had started to spread into Cyprus, Egypt and Europe, period known as the Neolithic Revolution.<sup>9</sup>

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Sakyamuni's attainment of Nirvana, for the salvation of sentient beings. The monks waited for his coming in their earthly form, as preserved mummies.

<sup>6</sup> N. LYNNERUP, "Mummies", *American Journal of Physical Anthropology* suppl. 45, 2007, p. 162-190.

<sup>7</sup> F. INTRONA, A. DE DONNO, V. SANTORO, S. CORRADO, V. ROMANO, F. PORCELLI, C.P. CAMPOBASSO, "The bodies of two missing children in an enclosed underground environment", *Forensic Science International* 207, 2011, e40-e47; C. P. CAMPOBASSO, R. FALAMINGO, I. GRATAGLIANO, F. VINCI, "The mummified corpse in a domestic setting", *American Journal of Forensic Medicine and Pathology* 30, 2009, p. 307-310.

<sup>8</sup> But it could be monophyletic characteristics without any human intervention as the example of semi-tough rachis and larger seeds in the early Holocene, about 9500 BC. G. HILLMAN, "Late Pleistocene changes in wild plant-foods available to hunter-gatherer of the northern Fertile Crescent. Possibly preludes to cereal cultivation" in D. HARRIS (ed.), *The origins and the spread of Agriculture and pastoralism in Eurasia*, London, Washington DC, Smithsonian Institution Press, 1996, p. 159-206.

<sup>9</sup> D. HARRIS (ed.), *The origins and the spread of Agriculture and pastoralism in Eurasia*, Smithsonian Institution Press, 1996, Chap. 3, "The expansion capacity of Early Agricultural systems: a comparative perspective of the spread of agriculture", p. 31-39, p. 33.

In the case of the New World, the items found recently in the Andes Mountains, in the intermontaneous region of Callejón of Huaylas, Ancash, Peru around 30 years ago, prove an earlier development, born independently of external influence. This archaeological site in Guitarrero Cave that contains human evidence of occupation, beginning approximately in 12,100 BC,<sup>10</sup> includes the earliest textiles identified in South America and stone tools.<sup>11</sup> It probably proves that the first agriculture in Peru is dated between 11,500-10,500 BC. In Tehuacan Valley, the early agricultural sites at Guila-Naquitza (8000 BC) evidence that Mexico began in a little later period than Guitarrero. Maybe this demonstrates that agriculture began earlier in the New World than in Egypt.

### AGRICULTURE AND CEMETERIES IN EGYPT

In the North, people migrations to the Nile began in the first Neolithic (c. 8000 BC) but around 5000 BC Neolithic settlements appeared all over Egypt. The Northern Merimde culture came about 5000 to 4200 BC, producing rudimentary ships that connected all the hamlets along the Nile River. Then, Fayum culture developed in 5000 BC and the first traces of cultivated plants were found there, near Cairo.<sup>12</sup> A new cycle began in 4000 BC, Omari age corresponding to Archaic Period; Buto Maadi cemeteries appeared at that time. They were not only herders and hunters but they also cultivated the land.

In the South, Upper Egypt, Badarian small groups of 40 to 100 people, gathered there from 4400 to 4000 BC, grew wheat and barley and created an irrigation system. Their practice of wrapping the dead body in animal skins spread during the Middle and Late Pre-dynastic periods (4500-3100 BC). At the same time in Northern Fayum A, Chalcolithic followed the Neolithic Tasian culture considered Stone Age. Amratian culture or Naqada I, very similar to Badarian, flourished between 4000-3500 BC and was followed by Gerzean culture or Naqada II (3500-3200 BC). It was largely an uninterrupted development of the first culture, starting in the Delta and moving to the South, establishing sedentary lifestyle. The first appearance of royal

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<sup>10</sup> T. LYNCH, R. GILLESPIE, J. GOWLET, R. HEDGES, "Chronologie of Guitarrero Cave, Peru", *Science* 229, 1985, p. 864-867.

<sup>11</sup> J. ADOVASIO, T. LYNCH, "Pre-ceramic textiles and cordage from Guitarrero Cave, Peru", *American Antiquity* 38- 1, 1973, p. 84-90.

<sup>12</sup> B. MIDANT REYNES, *The Prehistory of Egypt*, Oxford, Massachusetts, USA, Blackwell Publishers, 2000, p. 103.



Figure 1 - External prepared mummy (thebohemians-rpsody.tumblr.com)



Figure 2 - Internal prepared mummies: Egyptian Pharaoh Merenptah, Dynasty XIX (from E. Smith, *Cairo Catalogue: Royal Mummies*, 1912)

cemeteries, hieroglyphs, irrigation and first *serek* took place in Naqada III or Protodynastic period (3200-3000 BC).

### PRESERVING THE CORPS OF DEAD

Is the case of agriculture in America the same as mummification? Mummies may have served as a means of assisting the soul to survive and preventing the deceased from frightening the livings. A more commonly accepted theory is that there was an ancestor cult, delaying the final burial. Some evidence demonstrates that they travelled with the groups and took the place of honor during major rituals. The surprising perfection of Incan technique was achieved after other Andean cultures including their older predecessors, the Chinchorro culture, on the arid coast of the Atacama Desert between 7000-1500 BC. Their mortuary practices were based on skills they attained as subsistence hunters and fishermen.



Figure 3 - Reconstructed Chinchorro child mummy (from “Death-cult mummies inspired by desert conditions?”, *Amra26 Archaeology & Sciences News*, 15 september 2012, Photograph by Enrico Ferorelli, National Geographic)

Regarding Egypt already in the Badarian period (4400-4000 BC), the earliest burials, in shallow circular or oval pits, showed a belief in immortality, protecting and commonly covering bodies with goat-skins or woven matting. Frequently a basket or a leather pillow was placed over the head to insulate the face from the surrounding sand, as it was found in three children’s graves at Mostagedda (4000 BC)<sup>13</sup> in Upper Egypt. The corpse decomposition fluids, absorbed by the dryness of the desert, saved them from the complete decay and they soon became desiccated with well preserved skin and hair. The grave pit, itself, was not roofed over until considerably later and multiple room tombs, under the Mesopotamian influence, appeared in Naqada II.

This practice involved different aims in both worlds: natural desiccation, skin and flesh removal replaced

by clay; black, red or mud-coated materials, evisceration, body cavity treatments, drying, cleansing and anointing the interior, brain removal, corpses covered with natron before being washed and wrapped.<sup>14</sup>

Mummification can also be described as externally prepared mummies (fig. 1), internally prepared mummies (Egyptian Pharaohs) (fig. 2) and reconstructed mummies (Chinchorro) (fig. 3).

<sup>13</sup> G. BRUNTON, *Mostagedda*, London, Quaritch, 1937.

<sup>14</sup> A. AUFDERHEIDE, *The scientific study of mummies*, Cambridge, Cambridge University Press, 2003.



Figure 4 - Maya Death God Ah Puch (from P. Schelhas, *Representation of deities of the Maya manuscript*, Cambridge, Harvard University, 1904)

#### MUMMY CHRONOLOGIE AND BELIEFS IN AMERICA

The cultural diversity of prehispanic America is unified regarding beliefs about the afterlife and the funeral ritual to become ancestors in a cyclical life.

Both the Mayan and Mesoamerican civilizations showed great interest in death. They believed that cosmos had three major planes: the Earth, the Heaven above, celestial paradise of heroic kings and warriors, and the Underworld Xibalba, translated 'Place of Fear or Phantoms'. Structured in 9 levels below, reached by caves, cenotes and tunnels, it was dominated by the aged skeletal Maya god of death and putrefaction Ah Puch, meaning 'flatulent one' (fig. 4). Mesoamerican abundant funerary imaginary, recalled now on the Day of the Dead, was depicted in their artwork: skeletons, skulls, human carved bones, circular spots on the skin, closed dead eyes, open mouths, owls and bats, night and darkness, water and lilies.

The skeletal remains, covered with cinnabar or red ochre, an iron or ferrom oxide like blood color, symbolized life and rebirth, and had the virtue to stop putrefaction. It was an expensive material like jade which was used to give vitality and associated with life because of its green color. A jade bead in the mouth of corpses, wrapped in cotton mantles and buried with maize gruel, signified the life spirit and served as money in the afterlife. Only the

highest members of society rested inside sarcophagi in tombs filled with different goods of magical value: pottery, vessels, toys, weapons, trimmings and musical instruments, to be used in the afterlife.

In his *Account of the things of Yucatan*, Diego de Landa describes the ancient Mayan funerary practices.<sup>15</sup> Without fear of death, they revered their parents with wooden statues at home oratories. In the cult festivities, they offered them food and protection, being afraid of getting lost in the afterlife. Their souls, still alive, rested there, but this does not suggest any attempt to mummification.

Besides, the Inca Empire incorporated regional and ethnic diversity in a political achievement, including high degrees of technological, economic, socio-political and ideological development of previous Andean indigenous cultures. In Tawantisuyu, people believed in reincarnation and did not incinerate the corpses because their vital force would disappear, threatening their passage to the after world. Andean universe was divided in three different dimensions: Hanan pacha or 'upper world, Kay pacha or surface world and Ujku pacha, the inner world, place of seeds and subterranean beings, where ancestors lived a new existence similar to the living, not being disturbed by calamities. Moche (500-700 AD) and Chimú (1000-1430 AD) funerary rituals introduced skeletons and fleshless creatures, who appeared in dances, parties and erotic poses without tragic sense, confirming that life after death was parallel to the living universe.<sup>16</sup> This resulted in the consequent transformation of the grave space. The last evolution structure in Peruvian tombs is shown in a complex of impressive burial towers built by the Kollas in the Inca period: the spectacular Chullpas of Sillustani on the shores of Lake Umayo near Puno. In the central highlands (Condesuyo), the eviscerated deceased, preserved with balsamic substances, were placed in a burial tower or sepulcher.<sup>17</sup> Popular beliefs considered tombs and rulers' bodies as 'huacas', offering sacrifices and prayers to them. Based on a profound animism, sacred things had a spiritual power, including mountains, stones, rivers, caves and huacas.<sup>18</sup>

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<sup>15</sup> Landa's *Relación de las cosas de Yucatán: a Translation*, Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 18, 1941 (A. Tozzer Trad).

<sup>16</sup> J. QUILTER, "Moche politics, religion and warfare", *Journal of World Prehistory* 16, 2002, p. 145-195.

<sup>17</sup> A. COCKBURN, E. COCKBURN, T. REYMAN (ed.), *Mummies, diseases and ancient cultures*, Cambridge, Cambridge University Press, 1998.

<sup>18</sup> For the coastal Moche Indians, the *anima*, an invisible or personal spirit living inside the tangible corpse as a vital force, was carried by sea lions to the ancestral land in the Guano Islands. For others, after the final mourning rites, it was also embarked on a journey to

The social prestige conferred by textiles made the fabrics grow in wealth, woven with fine cotton, gold and silver threads and vicuna wool.<sup>19</sup> But this perfection is not due to the chronological evolution but to their work and dimensions, because in the Formative (1500-400 BC), Paracas, Nazca or Ica textiles could already be included among the best in the world.<sup>20</sup> Towards 2500 BC in Huaca Prieta, a coastal pre-ceramic site in the northern coast of Chicama valley, cotton and plant fibers before loom appeared in graves and thereafter cotton textiles, ritual clothing, large ceremonial robes (Paracas, Nazca) or canvas for clothes (fig. 5). In Sierra Chica, around 1000 BC, bodies were already wrapped in vicuna skins along with plant fibres. During the Formative, this mountain ritual



Figure 5 - Paracas textiles (from Enciclopedia Encarta, free use)

practice was exported to the south coast, and the Paracas mummy bundles included up to 9 different tissue layers (fig. 6) with embroidered or interwoven iconographical decorations.<sup>21</sup> Gods, myths, warriors, animals and plants were laid out in these coastal lords' great coats and garments. They were afraid that a relative could be cold by the lack of enough clothes and in rituals they added all the dead's ornaments and garments, including their 'chuspas' (sacs), 'yautos' and footwear.<sup>22</sup> Both in the mountains and on the coast,

'the rest house' or ancestral land 'Zamayhuaci'. In the highlands, moreover, it went to 'Ypamarca', 'land of mute' (P. DE ARRIAGA, *La extirpación de la idolatría en el Perú*, Madrid, Ed Atlas, [1621] 1968, BAE CCXXIX, p. 220), crossing over a great river, and it was introduced into a new body or became a star (CIEZA DE LEÓN, *Descubrimiento y conquista del Perú*, Madrid, Historia 16, 1984, p. 349).

<sup>19</sup> J. MURRA, "Investigaciones y posibilidades de la etnohistoria andina en la actualidad", Lima, *Revista del Museo Nacional* 35, 1970, p. 125-159.

<sup>20</sup> F. ANTON, *Ancient Peruvian Textiles*, London, Thames & Hudson, 1987.

<sup>21</sup> A. ALONSO SAGASETA DE ILURDOZ, "Los ritos funerarios en los Andes centrales", in *Exposition of Los Incas y el antiguo Perú. 300 años de historia*, Centro cultural de la Villa de Madrid, febrero-abril 1991, p. 126-149, p. 141.

<sup>22</sup> M. DE MURÚA, *Historia General del Perú. Origen y descendencia de los Incas (1590-1611)*, Madrid, Ed. Manuel Ballesteros-Gaibrois, 1964, cap. XXV,



Figure 6 - Nazca mummies  
(from R. Latchman Atacameño  
Archaeology, 1936)

they wore their 'ojotas' or rubber sandals, even in the Spanish penetration times. However, Guamán Poma, in order to remove idolatry, asked to keep the feet outside wrapping bundles to avoid the use of 'ojotas' as the Incas.<sup>23</sup>

At Wari Kayan cemetery (350 to 250 AD) on the steep north slope of Cerro Colorado, each burial consisted of a conical textile-wrapped bundle, most containing a seated individual facing north to Paracas bay. Each body, bound with cord and held in a seated position, was wrapped in many layers of intricate (fig. 7/8), ornamented and finely woven textiles, some of the finest of Pre-Columbian Andean societies<sup>24</sup>.



Figure 7/8 - Conical textile-wrapped bundle bound with cord and hold in a seated position with head, Chancay, Chimú and Necropolis cultures (from P. Kaulicke, *Contextos funerarios....*, fig. 25 and 21)\*.

\* P. KAULICKE, *Contextos funerarios de Ancón, Esbozo de una síntesis analítica*, Lima, Fondo Editorial Pontificia Universidad Católica del Perú, 1997.

<sup>23</sup> F. GUAMÁN POMA DE AYALA, *Nueva Crónica y buen gobierno* (1615), Caracas, Biblioteca Ayacucho, 1980, 2 Vol., p. 589.

<sup>24</sup> BADER, T., *Paracas Textiles*, London, British Museum, 2009.

At the top of the same hill, in Paracas Cavernas (700 AD) there are shaft tombs, reused over centuries, containing underground chambers, the secondary one used to prepare several mummy bundles with laborious processes of mummification. In some cases, the deceased heads were taken out, apparently for rituals, and later reburied.

In the lowlands and coastal regions (early Nasca civilization in the Yunga, 100-800 AD) mummification was slightly more complex.<sup>25</sup> Organs and flesh were not always removed, but when the flesh was, it was buried in ceramic vessels next to the dead. The bodies themselves, covered in a cotton shroud and wrapped in cloths and ropes, formed a 'mummy bundle, with the upper part painted and decorated to indicate a face, suggesting it played some societal role after death.<sup>26</sup> The mummies such as the Inca, displayed in their monumental sepulcher and buried with several grave goods, clothing, food and ornamentation, participated actively in the people lives, until the final burial.

The mummification practices varied from region to region in the vast Inca Empire. The mummified rulers, repeatedly brought to festivals and rituals, took part in their own mortuary cult. During public festival parades, Inca mummies, worshipped as ancestors or huacas, were given food and gifts, were treated as intermediaries between gods and humans and were consulted by special oracles. Associated with fertility, huacas were venerated with prayers and offerings for their power to regenerate life, were asked for assistance or



Figure 9 - Mummy or mallqui of the former Inca. Ruler is carrying in procession in November, month of dead or Ayamarcai quilla (from Chronicle of Felipe Guaman Poma de Ayala, p. 379)

<sup>25</sup> D. PROULX, "Paracas and Nazca: regional cultures on the south coast of Peru", in H. SILVERMAN, W. ISBELL (ed.), *The handbook of South American Archaeology*, Springer, 2008, p. 563-585, p. 576.

<sup>26</sup> CARMICHAEL, P., "Nazca burial patterns: social structure and mortuary ideology", in D. DILLEHAY (ed.), *Tombs for the living: Andean mortuary practices*, Washington D.C.; Dumbarton Oaks, 1995, p. 161-187.



Figure 10 - Mummies or Yllapa of Huaina Capac, Raua Occlo and Ninan Cuyuchic were carrying to Cuzco to the royal mausoleum or pucullo (from Chronicle of Felipe Guaman Poma de Ayala, p. 379)

advice, being their aid to the living more important than the attempt for their immortality. All their palaces, wealth, land and possessions remained in their male descendants' hands to support their cult for eternity. 'Huacas' were kept in 'resting points' or Zamana, a term meaning also mortuary caves. Funeral rituals, the most interesting Incan events, spanning from 1466 to 1634 AD, were restricted to kings, clan leaders and high nobles, the high social ranks (fig. 10). Instead, lower social classes were simply buried without any mortuary treatment.

The King bundles, cared for by the royal family, were fed, clothed and involved in daily activities. These 'visible, public living monuments' justified also the royalty of those elites, respecting their position in that society through their lineage, being considered worthy of this. "In November, the Month of the Dead, the deceased were removed from their graves, redressed with rich garments and feathers (fig. 9). They gave the dead food and drink. People danced and sang with the dead, parading them around the streets".<sup>27</sup>

To confirm the social different funeral rituals, more than 2,200 Inca mummies from all social strata inside 900 bundles, between c. 1438 and 1535 AD, have been recently found buried in the outskirts of Lima, Peru. The discovery took place in 2002 at the 20-acre site, known as Puruchuco-Huaquerones. Some of the most exciting findings are fifty false-head mummies of high-status level containing multiple individuals, from 2 to 7 corpses. Attached to the top of the whole body, the false head, resembling a human one, has a cotton wrapping shape and the finest artifacts are included inside and outside. The corpses have well preserved nails, intact hair and eyes. "Incan mummies were created by wrapping the body in layers of either cotton, grass, leaves or wood chippings to absorb body fluids and reduce decomposition of the tissue", says the

<sup>27</sup> F. GUAMAN POMA DE AYALA, *op. cit.*

archeologist leading the work, Guillermo Cock.<sup>28</sup> This excavation should transform the civilization concept – especially about this ritual, health and religious beliefs.<sup>29</sup>

## THE CHINCHORRO MUMMIES

As the Inca Empire was expanding, it incorporated the beliefs and practices of conquered people.<sup>30</sup> Richard Latcham states in 'Atacameño Archaeology'<sup>31</sup>: 'old Beliefs die hard'. Chinchorro burial practices did not completely disappear with their culture. Soon after them, very similar practices were carried out by Atacameño people, inhabiting the northern part of Chile. 'Their mummies, (in an extended position), were wrapped in skin of animals or sea birds'.<sup>32</sup> Provided the similarities between Chinchorro and Atacameño mummies, as well as the remarkable parallelism between these South American and Incan mortuary rituals, it is highly likely that the Andean royal practices were influenced, at least in part, by the Chinchorro, going from Atacameño culture directly to Incas,<sup>33</sup> according to Latchman.

The name of this pre-ceramic and pre-metallurgical fishing society means 'fishing boat' (Chinchorro). They inhabited the arid coastal region of southern Peru and northern Chile, from Illo to Antofagasta, between 7020-1500 BC, including the Atacama Desert (fig. 11). Their oldest dissected corpses are dated around 7020 BC and the first treatments appeared in 5050 BC, reaching



Figure 11 – Sudamerica (archive. archeology.org/image)

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<sup>28</sup> G. COCK, "Rescate Inca", EEUU, *National Geographic*, mayo 2002, p. 64-77.

<sup>29</sup> E. YOUNG, "Thousands of Inca mummies uncovered", *New Scientist*, 18 April 2002.

<sup>30</sup> J. REINHART, C. CERUTI, "Sacred mountains, ceremonial sites and human sacrifice among the Incas", *Archaeoastronomy: the journal of astronomy in culture*, University of Texas Press, 2005.

<sup>31</sup> R. LATCHMAN, "Atacameño Archaeology", *The American Antropologist* 38. 4 , 1936, p. 609-619, p. 609 .

<sup>32</sup> B. ARRIAZA, R. HAPKE, V. STANDEN, "Making the dead beautiful, mummy as art", *Archaeology Archive*, Archaeological Institute of America, December 1998.

<sup>33</sup> R. LATCHMAN, "Atacameño Archaeology", p. 610.



Figure 12 - Remains recovered in 1997 during the construction of a train depot in Arica (from “Making the dead..., Archeology magazine, 16 december 1998, [archive.archeology.org/image](http://archive.archeology.org/image))

a peak about 3000 BC. But the nearly 6000-year range presented by Arriaza<sup>34</sup> is much greater than any previously reported date, and mummies continued to be made until around 1800 BC. They were contemporary with Las Vegas and Valdivia cultures in Ecuador and the Norte Chico civilization in Peru.<sup>35</sup> In Quiani, the period following Chinchorro in Arica, the body was flexed lying on one side and dressed with an elaborate turban.<sup>36</sup> But some sites of the Quiani culture in other places coexisted with Chinchorro, thus great confusion surrounds this term and its relation to Chinchorro, using it for expressing different ideas and situations.

In 1914, Max Uhle began his work in Arica and found 282 mummies removed from burial sites such as El Morro, Camarones Cove and Platillos, placed in graves about 50 cm. deep. Approximately 208 were recovered from ten archaeological sites in small, densely populated cemeteries.<sup>37</sup> Only 149 of

<sup>34</sup> B. ARRIAZA, *Beyond death: The Chinchorro mummies of ancient Chile*, Washington DC, Smithsonian Institution Press, 1995, p. 15.

<sup>35</sup> A. ÁLVAREZ, “Rasgos funerarios Chinchorro en la costa del extremo sur peruano”, *Chungara, Revista de Antropología Chilena* 45, (2), Arica, Universidad de Tarapacá, 2013.

<sup>36</sup> B. ARRIAZA, *Beyond death:...*, p. 122.

<sup>37</sup> V. STANDEN, C. SARTORO, “Patrón funerario arcaico temprano del sitio Acha-3 y su relación con Chinchorro: Cazadores, recolectores y pescadores de la costa norte de Chile”, *Latin-American Antiquity* 15 (1), 2004, p. 89-109.



Figure 13 - Mummified Chinchorro Baby (from “Chinchorro mummies, the basic”, 14 de septiembre del 2010, chinchorromummies. wordpress.com )

these were created by Chinchorro artisan-morticians; the rest was the work of nature. In some cases, an embalmer would remove skin and flesh and replaced them with clay; in others, the internal organs were extracted and replaced with vegetable fibres or animal hairs. Nonetheless, very few mummies excavated before 1970 are available for study and it is not clear where they are located. There are few in Chilean museum collections.

Some of these ancient vestiges<sup>38</sup> are stored at San Miguel de Azapa Archaeological Museum, Tarapacá University, but others are distributed around the world as souvenirs. Two preventive conservation projects of this institution tried to solve damages caused by mechanical impact and environmental action (fig 12). They provided appropriate shelving and packing systems and built a storage room with minimum environmental impact.<sup>39</sup>

Notwithstanding, in June 2010, a new exhibition room was opened to the public in a site Museum placed at 10 Colon street, the first in South America. Archaeologists decided to leave almost 100 corpses, recently discovered in Arica, lying *in situ* under reinforced acrylic glass.<sup>40</sup> (fig 14)

<sup>38</sup> T. SEPÚLVEDA, P. AYALA, “La exhibición de cuerpos humanos en los museos: una reflexión a partir del caso de San Pedro de Atacama”, *Revista Museos* 27, 2008, p. 49-53. T. SEPÚLVEDA, P. AYALA, C. AGUILAR, “Retiro de los cuerpos humanos de la exhibición del Museo Arqueológico de San Pedro de Atacama”, *IX Seminario sobre Patrimonio Cultural “Museos en Obra”*, DIBAM, Santiago de Chile, p. 114-132.

<sup>39</sup> M. SANTOS VARELA, “Conservación preventiva de una colección única en el mundo: cuerpos momificados Chinchorro”, *Conserva* N° 6, 2002, p. 75-86.

<sup>40</sup> “Arica inaugura museo levantado sobre milenarias tumbas chinchorro”, *Emol. Cultura y Espectáculos*, 21 diciembre 2009.



Figure 14 - Museum of Arica *in situ* with burials and mummies of the ancient Chinchorro cemetery (from “Museo de sitio Colón 10”, *Arqueología del norte de Chile*, 23 de enero del 2010)

“The body, sacred in life, is profane in dead. It lacks health, vitality and beauty, its erstwhile owner having once and for all lost control over its presentation and individuality”.<sup>41</sup> Therefore, the living took control of it because they had the power to restore its lost qualities. Painting dead extended bodies was often a significant aspect. Being reinforced, stiffened, elaborately decorated and colored, even later repainted, it is thought to have been carried on reed litters and displayed. However, it is somewhat difficult to determine through archaeological records the reasons why Chinchorro society, being hunter-gatherer-fishermen and slightly nomadic, felt the need to preserve corpses. Anyway, “wear and tear, especially on the black and red mummies, as well as extensive repairs and repainted suggest that they may have been displayed in family or communal shrines or used in processions for many years before being interred in groups of four, five or six individuals, likely related”.<sup>42</sup>

These fishermen traditionally performed mummification on all members of their society, not only the elite. Children and babies received the most elaborated treatment (fig 13), and it was more frequently applied first to fetuses, neonates, lactating women and children, but later to all individuals.

<sup>41</sup> E. HALLAM, J. HOCKEY, G. HOWARTH, *Death and social identity*, London, Routledge Press, 1999, p. 131-32.

<sup>42</sup> “Making the dead beautiful...”

The earliest known child mummy found in the Camarones Valley, 50 miles south of Arica, dates c. 5050 BC. A sexual division of labor can be inferred according to burial goods in Chile, Morro 1, but there is no evidence of social stratification. Hunting tools were primarily associated with men while fishing tools were more often found with women,<sup>43</sup> including also camelid fiber cords clothing, harpoons, shells, cactus and composite fishhooks and weights, stone knives, lanceolate points, and atlatl darts. Small anthropomorphic wooden statues and miniature clay figurines resembling the mummies were also found. Reed fibers and basketry were used by the Chinchorros, although woven textiles, pottery and metal artifacts were not.<sup>44</sup>

Shell midden and bone chemistry suggested that 90% of their diet was seafood. Bernardo Arriaza explains that they were continuously exposed to arsenic, a deadly element which probably poisoned them for centuries<sup>45</sup> by drinking contaminated water in Camarones region. Being victims of arsenic poisoning, their life expectancy was affected.<sup>46</sup>

Ulhe<sup>47</sup> categorized three types of mummifications: mud coated mummies and simple and complex treatments with a great variation of techniques, but an internal or external treatment was carried out in body cavities in all of them. However, the overall way changed over the years although several traits remained constant throughout their history. In the mid 1990s, Bernardo Arriaza proposed three complicated *subtypes*: *red*, *black* and *bandaged*.<sup>48</sup> To him a Chinchorro mummy was either wrapped in a red mat or camelid skin shroud or covered with mud and buried naked or with a genital cover, laid on its back with legs extended or semiflexed. His hypothesis was that different techniques represented cultural transformations over time showing an increase in mummy-making complexity, followed by its

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<sup>43</sup> V. STANDEN, *El cementerio Morro I: nuevas evidencias de la tradición funeraria Chinchorro (Período Arcaico, Norte de Chile)*, Tesis inédita, Pontificia Universidad Católica del Perú, 1991.

<sup>44</sup> B. ARRIAZA, B. STANDEN, *Momias, muerte y ritos ancestrales*, Universidad de Tapacará, Ed. Universitarias, 2008.

<sup>45</sup> B. ARRIAZA, "Arseniasis as an environmental hypothetical explanation for the origin of the oldest artificial mummification practice in the world", *Chungara* 37 (2), 2005, p. 255-260.

<sup>46</sup> R. BENFER, J. TYPO, V. GRAF, E. PICKETT; "Mineral analysis of ancient Peruvian hair", *American Journal of Physical Anthropology* 48, 1978, p. 277- 282.

<sup>47</sup> M. ULHE, "La arqueología de Arica y Tacna", *Boletín de la Sociedad de Estudios Históricos Americanos* 3 (7-8), 1919, p. 1-48.

<sup>48</sup> B. ARRIAZA, "Tipología de las momias Chinchorro y evolución de las prácticas de momificación"; *Chungara* 26, 1994, p. 11-47 "Chinchorro Bioarchaeology: Chronology and Mummy seriation", *Latin-American Antiquity* 6 (1), 1995, p. 35-55. B. Arriaza, *Beyond Death....*, p. 135.



Figure 15 - Naturally desiccated Chinchorro mummy (from B. Arriaza, "The Chinchorro Mummies", artslivres.com)

decline and eventually discontinuation.<sup>49</sup> Actually, Chinchorro experienced a rise in population density between 5000-3000 BC. Environmental change acted as a positive and creative force in building up a social complexity. "The ritualistic mummification may have evolved as a result of the population increase that led to technological innovation", says Pablo Marquet of the Pontifical Catholic University of Chile, Santiago.<sup>50</sup>

**Type 1, Simple (Uhle):** appears to have been naturally mummified, without internal modifications, although some of them were painted with red ochre. Generally in extended, supine position (flat on his/her back), the lower extremities were occasionally slightly flexed. Burial furniture included plant branches,

pelican wings and/or leather and camelid wool. 47% of the natural mummification process (7020-1300 BC) resulted from environmental conditions, with a soil rich in nitrates combined with the aridity of Atacama Desert. Salts halted bacterial growth; warm, dry conditions facilitated rapid desiccation, evaporating all body fluids. Soft tissues occasionally dried before they decayed and Chinchorro people still buried these bodies wrapped in reeds with grave goods (fig. 15).

**Type 2, Complicated (Uhle):** includes a great variation of techniques, but all of them evidence an internal and external treatment of the body cavity.<sup>51</sup> Once emptied and dried with fire or hot ashes, the mummy was then filled and shaped with clay, camelid fibers, dried plants and ashes. Skin, all soft

<sup>49</sup> B. ARRIAZA, M. DOUBRAVA, V. STANDEN, H. HAAS, "Differential mortuary treatment among Andean Chinchorro fishers: social inequalities or in situ regional evolution?", *Current Anthropology* vol. 46 (4), 2005, p. 662-671.

<sup>50</sup> "Climate change shaped ancient burial rituals in Chile", News and comments of San Miguel de Azapa Archeological Museum, 14 August 2012.

<sup>51</sup> V. STANDEN, "Temprana complejidad funeraria de la Cultura Chinchorro", *Latin American Antiquity* 8, 1997, p. 89-109.

tissues and organs, including the brain, were removed. Then, the skeleton would be reassembled, reinforced with sticks while the skin, carefully removed and set aside, was stuffed with vegetable matter. Muscles would be re-created with thin bundles of wild reed and sea grass. Once prepared, the outer surfaces were covered and modeled with an ash paste or white clay, including the genitalia, and finished with a coat of shiny black manganese or in later days, red ochre. Many had clay masks and were capped with a wig. The eyes, nose and mouth were represented by slight incisions and bumps. Completely covered and dried in clay, they were placed in an extended, supine position onto plant fiber mats and wrapped in reeds. Finally, mummies were covered by a llama or alpaca skin or wrapped in these skin bandages, and were left to dry out for 30-40 days. Arriaza used these characteristics to create his typology.<sup>52</sup>

**Type 3, Mud-coated (Uhle):** also in supine, extended burials, some dried by fire or heated coals, dated c. 2000-1500 BC, these corpses were covered by a thin layer of sand and plant material or mud, fixing them to the grave floor.

Later archeologists have expanded Uhle's explanations and, including grave goods, classified the following kinds: *natural, black, red, mud-coated and bandage mummies*. Different types coexisted all in the same tomb but the two most common were Black and Red methods and occasionally covered with mud. But in one case, a mummy torso and arms had both black with red and yellow stripes<sup>53</sup> (fig. 16). Similar paintings have also been found in Melanesian cultures.

**The black mummy technique** (5050-2500 BC) (fig. 17) was by far the most complex because the body was completely dismembered and reassembled. Head, arms and legs were removed from the trunk. Skin and flesh were completely



Figure 16 – Striped Chinchorro Mummy (from wikipedia.org, free use)

<sup>52</sup> B. ARRIAZA, “Tipología de las momias...”; p. 30-36.

<sup>53</sup> M. ALISON, G. FOCACCI, B. ARRIAZA, V. STANDEN, M. RIVERA, J. LOWENSTEIN, “Chinchorro, momias de preparación complicada: Métodos de momificación”, *Chungara, Revista de Antropología Chilena* 13, 1984, p. 155-173.



Figure 17 - Head of Chinchorro black mummy (from [chinchorromummies.wordpress.com](http://chinchorromummies.wordpress.com))

stripped from the bones with stone tools, later dried by hot ashes or coal. All soft tissues, also brain and viscera were removed from the corpse. As the Aleutians did, Chinchorro fishermen replaced the insides by natural materials such as dried grass, vegetable fibres or animal hair or skin (fig. 18). After reassembly, corpses and facial features were covered with a white ash

paste, filling the gaps with grass, ashes or animal hair. Skin, painted with black manganese, was refitted on the body, including facial one, sometimes



Figure 18 - Burial with multiple layers of plant material, with ties of the same matter (from A. Umire Álvarez, *Rasgos funerarios Chinchorro en la costa del extremo sur peruano*, *Chungará* 45, n° 2, 2013, fig. 6 a y b)



Figure 19 - Red Chinchorro mummy head (from “Painting the dead”, [chinchorromummies.wordpress.com](http://chinchorromummies.wordpress.com))

in smaller pieces or in almost one whole piece or replaced by sea lion hide. A clay mask incised with small slits for the eyes and mouth was placed over the face to give the impression of a peaceful slumber; all completed with a short black human hair wig. Then, the corpse was wrapped in reeds and left to dry out for 30-40 days. In a technical sense, a black mummy with its frame and ash paste layers, its external human covering and sea lion hide was more like a statue, a work of art extremely fragile due to the disintegration of the unbaked clay.<sup>54</sup> The plasticity of shape and colours, and the mixed elements used in the creation of these statues made them sacred objects revered by Chinchorro mourners.

About 2500 BC, black mummies went out of fashion, perhaps reflecting a change of ideology or because manganese became scarce.<sup>55</sup> Nowadays, there is absolutely no manganese anywhere near the buried places and the nearest known deposits are 60 to 80 kilometers away. Most archaeologists believe that Chinchorro would not have traveled more than 40 kilometers,

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<sup>54</sup> “Making the dead beautiful...”

<sup>55</sup> *Ibidem.*

as Geologist John van Hoesen from Vermont said. So manganese might have washed downstream from two river beds in the area.<sup>56</sup>

*In the red mummy technique* (2500-2000 BC) (fig. 19), the corpses were not totally dismembered. Instead, many incisions, later sutured using reed cord or human hair and a cactus thorn needle, were made on the arms, legs and abdomen to remove muscles and entrails and dry the internal space, replaced with reeds, clays and llama fur. The signs of burning suggest that they have been dried with lit coals. The body, packed with various materials, returned to more-normal dimensions, using sticks to strengthen it. The head was always cut to remove the brain and placed back with a wig made from human hair tassels of 60 cm. long. Covered with a clay face mask, there was a change now with open eyes and mouths that conveyed a sense of alertness rather than sleepiness. It may foreshadow the Inca practice of feeding and talking to the ancestors or it also may have served as a way to enable the return of the soul to the body.<sup>57</sup>

A 'hat' of black clay held the wig in place and everything, except for the upper part, was painted with red ochre,<sup>58</sup> which is abundant near Arica.

*The mud-coat final style* (first half of the 2<sup>nd</sup> century-1800 BC). This incredible mummy preservation was also influenced by soil evolution, creating malleable clays which acted as cementing agents and gypsum as a natural desiccant. This allowed the morticians to mold a colorful dead appearance with an advantage: the foul desiccating smell would be covered. Artisans no longer removed viscera, bodies were just desiccated, and a thick layer of mud, sand and a binder like egg or fish glue was used to cover corpses. Once the preparation was completed, mummies were cemented into their graves. This change in procedure may have come from outsiders and their different culture influence, or from disease associated with corpse rotteness.

*The bandage method*<sup>59</sup> (estimated from 2620-2000 BC), only found in three infants, is a mixture of the black technique, being the body disassembled and reinforced by bandages but treated like the red mummies; the head was painted with black manganese, instead. Animal and human skin was used to wrap.

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<sup>56</sup> "GMC geology professor to dig into Chilean Burial methods", News and comments of San Miguel de Azapa Archaeological Museum, 14 febrero 2010.

<sup>57</sup> "Making the dead beautiful..."

<sup>58</sup> V. STANDEN, "Temprana complejidad funeraria de la Cultura Chinchorro (Norte de Chile), *Latin-American Antiquity* 8 (2), 1997, p. 134-156.

<sup>59</sup> B. ARRIAZA, "Tipología de las momias..", p. 37.

Mario Rivera, an expert on Andean Chinchorro fishermen, postulates that the high frequency of red pigment indicates “*an emphasis on fertility and possible life after death*”.<sup>60</sup> The use of cinnabar or red ochre could have represented blood, in an attempt to restore vitality. Bernardo Arriaza suggests a similar interpretation, being essential to be alive in the living world as well as in afterlife. In contrast, to him black is a symbol of death, not the end of a life cycle but only a transition from one state to the next. “*Black is equated with darkness, like the night, invisible yet present. Black is what is hidden, it is a mystical transition*”.<sup>61</sup> The brown colored mud would be a return to the earth while treatment and body decoration could symbolize helping the dead to become more alive. Also, it could have meant a way for both friends and family to mask his profane view<sup>62</sup> and remain at home a little longer.<sup>63</sup> When the process of making the dead beautiful was complete (after wear, tear and repair), mummies played a specific role in different cultures. The Aleutians used them as a talisman, sealing off bodies to keep their spirit, while in late periods, Chinchorro people left the mouth open, at least to speak or receive food. They eventually buried the dried-out remains in desert cliffs, to symbolize the return to earth while the removed soft tissues may have been deposited in the westlands or the ocean.

#### CHINCHORRO MUMMY CHRONOLOGY:

- 7020-5050 BC: Founder Period (First natural mummies)
- 5050-4800 BC: Initial Period
- 4980- 2500 BC: Classic Period (Black)
- 2500-2000 BC: Transitional Period (Red)
- 2000-1800 BC: Late Period (Natural, Mud)
- 1500-1100 BC: Quiany Period (completely new tradition, semi-flexed, naturally mummified)

### MUMMIFICATION IN ANCIENT EGYPT, FIRST STEPS

From Paleolithic, man did not want to dread death and most of them believed in an afterlife. Since then, the corpses were entombed with everyday

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<sup>60</sup> M. RIVERA, “The pre-ceramic Chinchorro complex of Northern Chile: Content, style and purpose”, in T. DILLEHAY (ed.), *Tombs for the living, Andean mortuary practice: a Symposium at Dumbarton Oak 12 -13 october 1991*, Washington, Dumbarton Oak Research Library and Collection, 1995, p. 43-68, p. 63.

<sup>61</sup> B. ARRIAZA, *Beyond death...*, p. 120.

<sup>62</sup> B. ARRIAZA, “Chile’s Chinchorro mummies”, *National Geographic*, March 1995.

<sup>63</sup> B. ARRIAZA, *Cultura Chinchorro. Las momias más antiguas del mundo*, Santiago de Chile, Ed. Universitaria, 2003.



Figure 20 - The oldest known Egyptian Mummy, Ginger 3500 BC, Late Predynastic, Gebelein, now in British Museum, (from A. SPENCER, *Death in ancient Egypt* ....plate 2)

life belongings as evidence of care and ceremony. The funerary equipment to be used in the next life such as pottery vessels, beads, flint tools, slate palettes with cosmetics, are widely referred to in previous examples. Other objects, as small amulets made of semiprecious stones, showed the introduction of magic into burial beliefs.<sup>64</sup> In Predynastic period (4500-3100 BC) Egyptians probably were already concerned with an eternal life after death, and this concept characterized Egyptian civilization for over three thousand years.<sup>65</sup> The six hundred graves from Badarian culture (4400 to 4000 BC) found for the first time in Assyut, were shallow circular or oval pits, in which the corpses was interred covered with goatskins or woven matting.<sup>66</sup> The body, contracted on his left side with head generally to the south resting on a pillow and face to the west, carefully laid upon a mat wrapped with another to protect it from the sand. “*The idea of the west being the place of the entrance into another existence may well have been in the minds of Nile dwellers long before it was written down*”.<sup>67</sup> “*When the bodies were unprotected from the enclosing sand, a process of*

<sup>64</sup> A. SPENCER, *Death in ancient Egypt*, London, Penguin Books, 1991, p. 30.

<sup>65</sup> B. ADAMS, *Egyptian mummies*, Shire Egyptology, Buckinghamshire, 1992, p. 7.

<sup>66</sup> G. CATON-THOMPSON, *Badarian Civilisation*, London, British School of Archaeology in Egypt, 1928.

<sup>67</sup> CH. EL MAHDY, *Mummies, Myth and Magic in ancient Egypt*, London, Thames and Hudson, 1989.

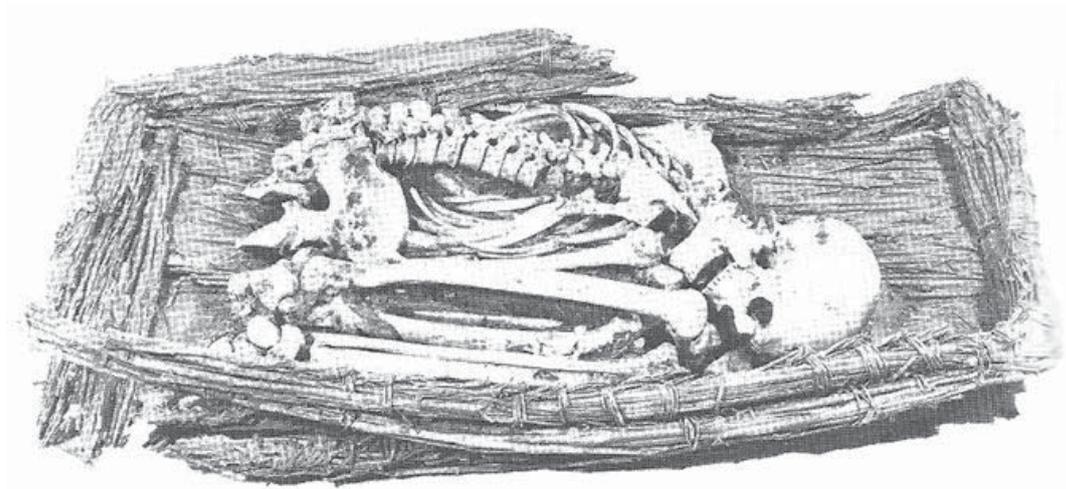


Figure 21 – First Dynasty burial in a basketwork coffin (from A. SPENCER, *Death in ancient Egypt...* plate 3)

*swift natural desiccation took place, the decomposition fluids were leached into the dry sand, and the skin, hair, tendons and ligaments rapidly dried; internally, connective tissue and the larger organs were preserved*".<sup>68</sup> Egyptians had probably observed this natural preservation very soon, trying not to expose burials to animals, accidental disturbance or erosion. However, the oldest natural Egyptian mummy appeared at Gebelein in Late Predynastic (3500 BC) (fig. 20).

Egyptians made great efforts to ensure eternal survival of their souls and the integrity of the residing body. Thus, the mummy was preserved in a recognizable shape or was replaced by the deceased statuary.<sup>69</sup> This final idea suffered an evolution from Pre-dynastic to Dynastic times because, at first, they defleshed and chopped-up human remains.

There is a change in Pre-dynastic graves in the late Naqada II period (3500-3200 BC). They became much bigger and more elaborate and in some cases in Naqada and Hierakonpolis, the regional chief's eternal homes were undoubtedly the most important and of the best quality. During the middle and late Pre-dynastic Periods (4500 to 3100 BC), the first practice of wrapping in animal skins gave way to another, the corpse was laid out upon a basketwork tray (fig. 21) or buried in a short wooden coffin. Designed for a contracted body, it was considered to be a suitable lodging, similar to the living people's houses. The evolution of graves, transformed in an underground

<sup>68</sup> B. ADAMS, *op. cit.*, p. 7.

<sup>69</sup> A. DAVID, *The ancient Egyptians, religious beliefs and practices*, London-New York, Routledge and Kegan Paul, 1986.



Figure 22 – Simple pit-grave at Abydos, dismembered limbs, Predynastic Period, (from A. SPENCER, *Death in ancient Egypt*, pl. 36)

Clearly, part of the skeleton had been separated before burial and the head had been entirely lost or placed apart from the rest. Lower arms were isolated but relatives probably mutilated the body eating parts of the flesh as a way to acquire the dead's virtues, following this ancient belief. In Naqada graves, bones showing signs of deliberate fracturing and gnawing to extract the marrow<sup>71</sup> have been very frequently found.

The skeletons in burials were not intact in their propped positions or they were decapitated (fig. 22). Feet, pelvis and skull were missing or were found in an unusual position. The Old Kingdom examples are of particular interest since evidence of bone displacement was found within wrapped mummies externally intact. In a Meydum tomb, clean bones without flesh had been wrapped. Pyramid Texts (sp. 735-6) seem to allude to such a ritual custom, connected perhaps with the legend of Osiris, cut up by his brother Seth (sp. 1683-5)<sup>72</sup> and this theory is also confirmed by sp.1018 c and 1884c:

<sup>70</sup> W. PETRIE, *Naqada and Ballas*, London, Quaritch, 1896.

<sup>71</sup> A. SPENCER, *op. cit.*, p. 39-41.

<sup>72</sup> E. OTTO, *Egyptian art and the cults of Osiris and Amon*, London, Thames & Hudson, 1968.

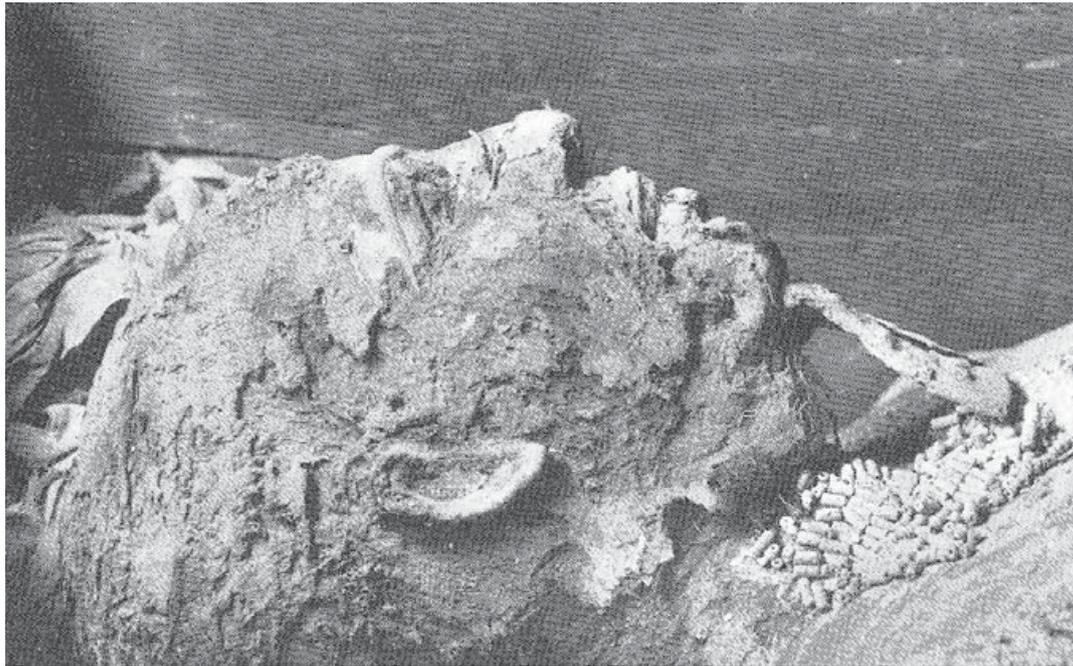


Figure 23 - Fifth Dynasty mummy Nefer at Saqqara with modelled stucco plastered linen, a false beard and beads (from B. Adams, *Egyptian mummies*, fig. 6, p. 16)

*“The dismembered limbs are collected, thou who has might over the bows”, “That I may collect for thee thy flesh, that I might assemble for thee thy bones”.* However, mummification introduced later the aim of preserving flesh.<sup>73</sup>

The dismemberment theory was proposed by Petrie and opposed by Elliot Smith. who argued with other later scholars that plundered and disturbed graves would be restored by relatives and reburial again.<sup>74</sup> This interpretation of pre-burial ‘ceremonial rites of dismemberment’ of early period would set off a controversy over Late or Greco-Roman mummies. The removal of their bones in considerable disarray and in wrong places was explained differently: as a decline of preservation practices, as an advanced state of decay or lack of adroitness in the embalming workshop technique.

Until the end of Predynastic period, the funerary practices did not include the dead preservation by artificial means as the contact with the hot dry sand was enough. At Early Dynastic age (3200-3000 BC), the frequent

<sup>73</sup> J. GRIFFITHS, *“The origins of Osiris and his cult*, Leiden, E. J. Brill, 1980.

<sup>74</sup> He states that *“there is strong presumptive evidence that mummification was attempted in the First Dynasty”*, due to the Second Dynasty examples found by Quibell at Saqqara. QUIBELL; *“The history of mummification in Egypt”*, *Proceedings of the Royal Philosophical Society of Glasgow*, 1910, (abstract), p. 7.

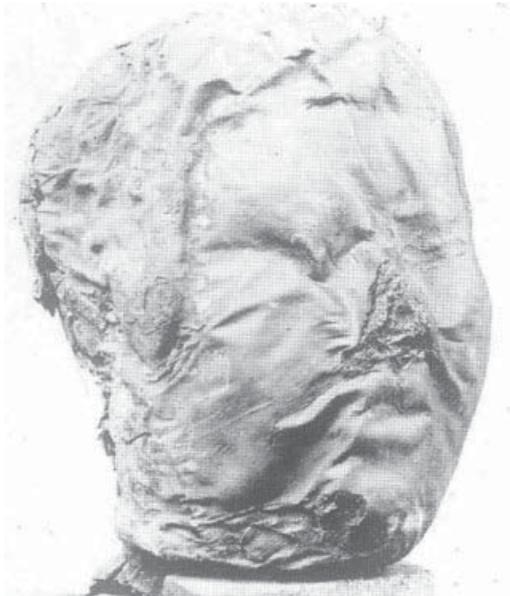


Figure 24 - The head of Fourth Dynasty noble Ranefer, with painted moulded linen carpace, (from B. Adams, *Egyptian mummies*, fig. 3, p. 12)

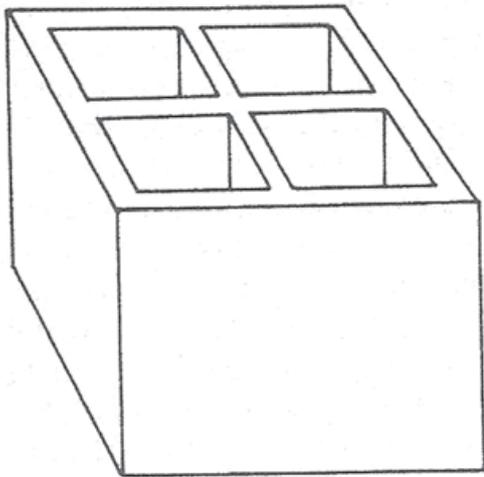


Figure 25 - The alabaster canopic box of Queen Hetepes (from A. SPENCER, *Death in ancient Egypt*, fig. 6, p. 37)

remains. The normal type of burials, found in Walter Emery's excavations

use of wooden coffins<sup>75</sup> aggravated deterioration, since coffin-like enclosures minimized the effects of natural dessication reducing skeletons completely.<sup>76</sup> After the unification of Egypt, about 3100 BC, continuous improvement in this sense was incorporated. In Djer queen's tomb (First Dynasty), a forearm was found wrapped in many layers of linen bandages with four gold bracelets, decorated with turquoise and amethyst beads and amulets.

Once this early artificial technique was implemented, the basic process of linen bands encircling limbs and fingers embedded in resin finally became standard in the Early Dynastic and Old Kingdom, but not very extensive.<sup>77</sup> In First, Second and Third Dynasties the use of close-fitting linen wrappings was developed and at Saqqara, Second Dynasty examples, unearthed during Quibell's excavations, were found in a regular contracted position, with fourteen layers of bandage over the mummy's chest and eight around the limbs.<sup>78</sup>

Only a wrapped human foot was found in the subterranean spaces of King Zoser's Step Pyramid, but this method was apparently applied to his

<sup>75</sup> PLUTARCH, *De Iside et Osirides* (12-14), describes the myth of Osiris and mentions that Seth made a chest or sarcophagus of Osiris measurements and threw it into the sea to kill him.

<sup>76</sup> A. SPENCER, *op. cit.*, p. 34.

<sup>77</sup> B. ADAMS, *op. cit.*, p. 9.

<sup>78</sup> J. LAUER, *Saqqara: The Royal cemetery of Memphis*, London, Thames & Hudson, 1976.

of the First Dynasty tombs,<sup>79</sup> shows remains of linen layers over the bones while, at Saqqara, he found a male corpse in a semi-contracted position with traces of soft-tissues and fingers linen wrapped separately. His breasts and genital organs were molded<sup>80</sup> in pliable linen, creating an accepted resemblance of intact body. However, soft tissues decomposed very rapidly so textile materials were in close contact with the skeleton.<sup>81</sup> Moreover, the older rectangular pits were replaced by mastabas with the burial and small store chambers and a rectangular superstructure of mud-brick or stone.<sup>82</sup>

Another innovation took place in the very beginning of the Fourth Dynasty (2613- 2498 BC): the organs were eventually removed through a small abdominal incision in a full extended position, although the contracted position continued in poorer graves, preserving archaic customs in simple cemeteries. This speedy separation of the liver, lungs, intestines and stomach, prevented natural decay since a few hours later death viscera and soft tissues decomposed and after two to three hours – depending on the ambient temperature – putrefaction started producing hydrogen sulphide, methane and other malodorous components. The preserved viscera, wrapped in resin linen like the cavity, were deposited in a safe place, in a recess of the south side wall in the burial chamber, as in the Ranefer's tomb in Meydum. His head, including the dried brain, was cut out by plunder, replaced and supported by a stone (fig. 24). The facial surface was modelled and painted with the hair in black, the eyes and eyebrows in green and the mouth in red. The remains of Tomb 17 at Meydum, were in confusion, defleshed before wrapping, but eviscerated, and for first time the brain was removed at skull base.<sup>83</sup> Perhaps it was the result of grave robbery that started in Egypt as soon as there were rich contents to be pillaged and then it was difficult to find intact mummies.

The viscera packages, wrapped and preserved in a dilute natron solution, were preserved in an alabaster box with four internal compartments as Queen Hetepheres, the mother of Khufu or Keops, at Giza (fig. 25) or Tuthankhamun<sup>84</sup> (fig. 27) only available for persons of the highest rank.

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<sup>79</sup> W. EMERY, *Great tombs of the First Dynasty*, London, 1954, T. II, p. 24-26.

<sup>80</sup> W. EMERY, *Archaic Egypt*, London-New York, Penguin, 1987.

<sup>81</sup> A. SPENCER, *op. cit.*, p. 35.

<sup>82</sup> A. REISNER, *The development of Egyptian Tomb down to ascension of Cheops*, Cambridge (MA), Harvard University Press, 1936.

<sup>83</sup> B. ADAMS, *op. cit.*, p. 13.

<sup>84</sup> C. ANDREWS, *Egyptian Mummies*, Cambridge, Massachusetts, Harvard University Press, 2004.

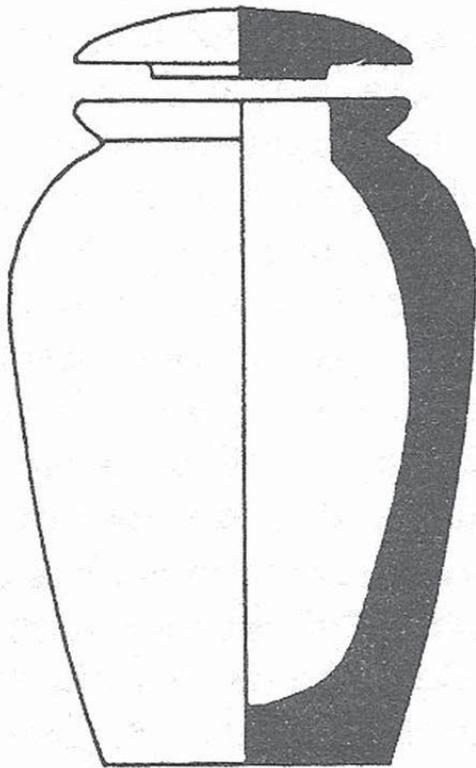


Figure 26 - Old kingdom canopic jar  
(from A. SPENCER, *Death in ancient Egypt*, fig. 7, p. 37)

Installed in a niche or in a small pit in the floor, it was almost always situated in the south-east corner.<sup>85</sup> In the case of lower class people, these packages were not protected by any container but later they were placed in limestone jars (fig. 26) or canopy jars as those used at Saqqara (2181-2040 BC), where the bodies, wrapped in linen, had cartonnage face masks (fig. 28).

Egyptians reached an efficient and advanced stage in wrapping mummies with resin soaked linen and modeling the whole body,<sup>86</sup> technique widespread in the Fifth and Sixth Dynasties but extended later. Facial details were sometimes depicted in green, a symbolic color of rebirth and resurrection to Egyptians, and some designs of the

outermost wrappings could imitate the color and materials of clothing. Fifth Dynasty Nefer's mummy was discovered in excellent conditions at Saqqara in 1966 (fig. 23). The exterior wrappings had been coated with stucco plaster, reproducing exactly his facial appearance: he was wearing a wig with short hair, small eyes, eyebrows, a moustache covering the upper lip and a false linen beard on his chin. The embalmers turned the wrapped body itself into a virtual portrait statue while the *ka* statue, placed in the *serdabs*, would act as a substitute for the deceased body.

Sometimes the male sexual organs were also modelled in cloth and placed in position or sealed with resin and everything would be re-united by magical means. At Giza mastabas in Shaft B of Tomb 2220, there was one of the best preserved and earliest female mummies of Old Kingdom. The mummy consists of an extended female body with viscera in place but her facial features were modeled and painted in linen bandages with one or two other embellishments.

<sup>85</sup> A. SPENCER, *op. cit.*, p. 36-38.

<sup>86</sup> *Ibidem*, p. 38.

There was an improvement in the mummification process at Eleventh Dynasty (2060-1991 BC): large amounts of dry natron, a mixture of sodium carbonate and sodium bicarbonate or chloride, were used to dehydrate the bodies. It was preferred to common salt as it was a purifying agent capable of dissolving fats and used for cleaning. Prolonged contact with this product was risky for the embalmers since the skin became irritated with signs of redness and blistering. In the eyes it caused conjunctival edema and even corneal destruction, and if inhaled, the respiratory tract became irritated, causing coughing and difficulty in breathing.

Natural oil or resin stopped dehydration and restored or preserved epidermis elasticity, becoming brittle in the process. Surface decomposition produced the loss of superficial epidermis, hair and nails and some layers were detected on bodies. By the Middle Kingdom a turpentine-like oleo-resin was also injected into the anus to dissolve the organs and to extract them.<sup>87</sup> The large amount of sand adhered to the remains of sixty decomposed soldier bodies of King Nebhepetre II Mentuhotep, victims of a battle, suggests that they had been temporarily buried in sand prior to being wrapped, instead of being embalmed. This inexpensive and simple strategy of drying with some degree of preservation was applied in poor burials<sup>88</sup> as in Pre-dynastic graves.



Figure 27 - Tutankhamun's canopic chest and lids in the form of human head with four internal compartments (from [bmasry2.blogspot.com](http://bmasry2.blogspot.com))



Figure 28 - Mummy and painted cartonnage (from [common.wikimedia.org/free use](http://common.wikimedia.org/free use))

<sup>87</sup> *Ibidem*, p. 113.

<sup>88</sup> *Ibidem*, p. 113-114.

A more elaborated process took place in the Twelfth Dynasty (1991-1782 BC): the heart was left in place after the internal organs were removed, the lids of canopic jars have the head of the gods to protect the entrails, the body cavity was disinfected and stuffed with linen, more people were buried in anthropoid coffins, fingernails were tied to prevent their loss; wooden or clay models or shabtis to act as servants were introduced and rock- tombs gained in popularity.<sup>89</sup>

### SIGNIFICANT ADVANCES AND LATER DECADENCE

Significant advance was reached in the New Kingdom (1570-1070 BC): mummification had many steps and the process took 70 days. During this embalming period, extensive rituals were carried out in *Per-Nefer*, the House of Beauty, where the deceased were laid on the embalming table, resembling a modern dissecting one<sup>90</sup> (fig. 33). The first operation included a change in the method: in order to extract the brain, a metal chisel or hook was inserted through the nostrils (1500 BC), after breaking the ethmoid bone.<sup>91</sup> The lower organs, except for the kidneys,<sup>92</sup> were removed through a slit on the left side of the abdomen,<sup>93</sup> the diaphragm was cut and thus the lungs and all contents from the chest cavity were extracted, leaving the heart, 'the seat of the mind'. The whole body, covered in a thick layer of dry natron, from head to toe for 40 days, was finally much darker in colour. This darkened skin appearance was a common condition resulting from resin applications used for insulating tissues from moisture<sup>94</sup> (figs. 29/30/31). Once dessiccation was finished, the corpse was taken to *Wabet*, the House of purification, where

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<sup>89</sup> B. ADAMS, *op. cit.*, p. 27.

<sup>90</sup> It is probably that the brain was not removed with the body's supine position on the embalmers' table as it had been suggested. Almost certainly the brain was broken into a semiliquid state and was evacuated when the cadaver was positioned with the head downward. B. BRIER, R. WADE, "Surgical procedures during ancient Egyptian mummification", *Chungará* vol. 33, n° 1, Arica, enero 2001. The authors attempted to replicate Egyptian mummification with a human cadaver.

<sup>91</sup> F. LEEK, "The problem of brain removal during embalming by the Ancient Egyptian", *JEA* 55, 1969, p. 112-116.

<sup>92</sup> The kidneys were left in place but in some mummies were removed. It is possible that some embalmers were unaware that there were kidneys. They, somewhat isolated, were next removed after the intestinal tract and spleen, by an incision through the lateral border of the fibromuscular capsule, and the blood vessels and ureter were also excised. B. BRIER, R. WADE, *op. cit.*

<sup>93</sup> An incision, approximately 2.5 inches long, was made using an obsidian stone flake blade to the left of the umbilicus following a sagittal and hypocondriac plane. B. BRIER, R. WADE, *op. cit.*

<sup>94</sup> D. HOPKINGS, "Ramses V, earliest known victim?", *World Health*, 1980, p. 220, n 131.

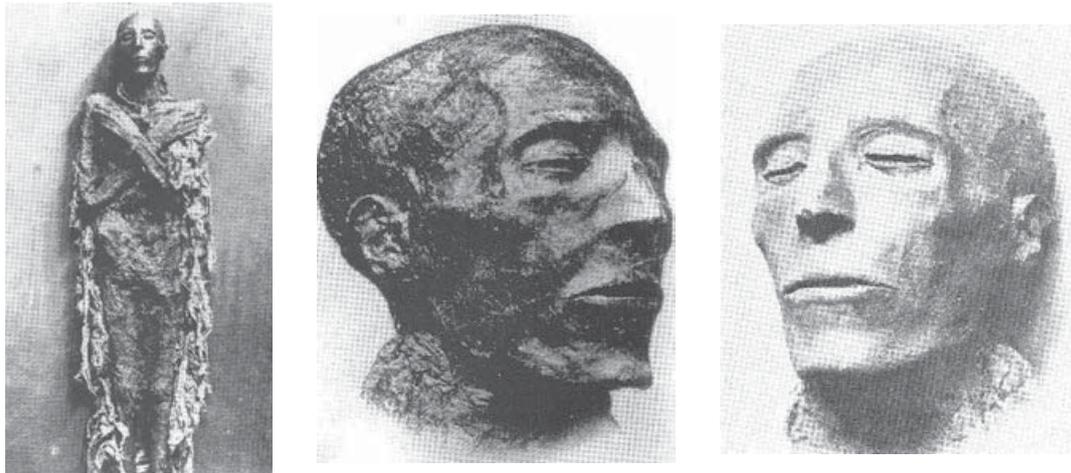


Figure 29/30/31 - The well preserved mummy of Seti I, XIX th Dynasty and his head (from B. Adams, *Egyptian mummies*, fig. 34-35, p. 42 and A. Spencer, *Death in ancient Egypt*, plate 16)

it was washed with salt-free Nile water. The body cavities were filled with linen packets of sawdust or myrrh, the whole body surface was rubbed with a mixture of cedar oil, wax, natron and gum; then it was coated with molten resin to close the pores and this resulted in a better preservation. Each limb, together with the head and torso, was separately wrapped and amulets were placed in and around the bandaging layers. Finally, the mummy was placed in its coffin, with its arms lying straight down at the sides but later they were folded upon the chest, a new style that lasted until the end of the Twentieth Dynasty. The nails with binding or tubular fingerstalls of metal were securely fastened in place.

The earliest and fullest account about embalming is that of Herodotus (II, 86-89).<sup>95</sup> When the historian visited Egypt in 425 BC this art was declining considerably. On the other hand, the New Kingdom careful ritual was accurately preserved in memory. Radiographic techniques have enabled non destructive studies of mummified remains, pioneered by Petrie in 1898, and multidisciplinary approaches have confirmed ancient data and supplied new information. Nonetheless, Greek historians, including Diodorus

<sup>95</sup> A. LLOYD, *Herodotus, Book II*, Comentary 1-98, Leiden, Brill, 1976, p. 351-366. But scientists, using scholarly descriptions and CT scans, have now proved that Herodotus' *Histories* do not necessary reflect universal practices and timeless truths. Herodotus' accounts were neither accurate nor adequately representative of what really happened. D. HAYTON, "Scientists prove that Herodotus lied", *Historical expertise*, Jun 30<sup>th</sup> 2013; dhayton.haverford.edu; A. WADE; A. NELSON, "Radiological evaluation of evisceration tradition in ancient Egyptian mummies", *HOMO, Journal of Comparative Human Biology* 64, 2013, p. 1-28.

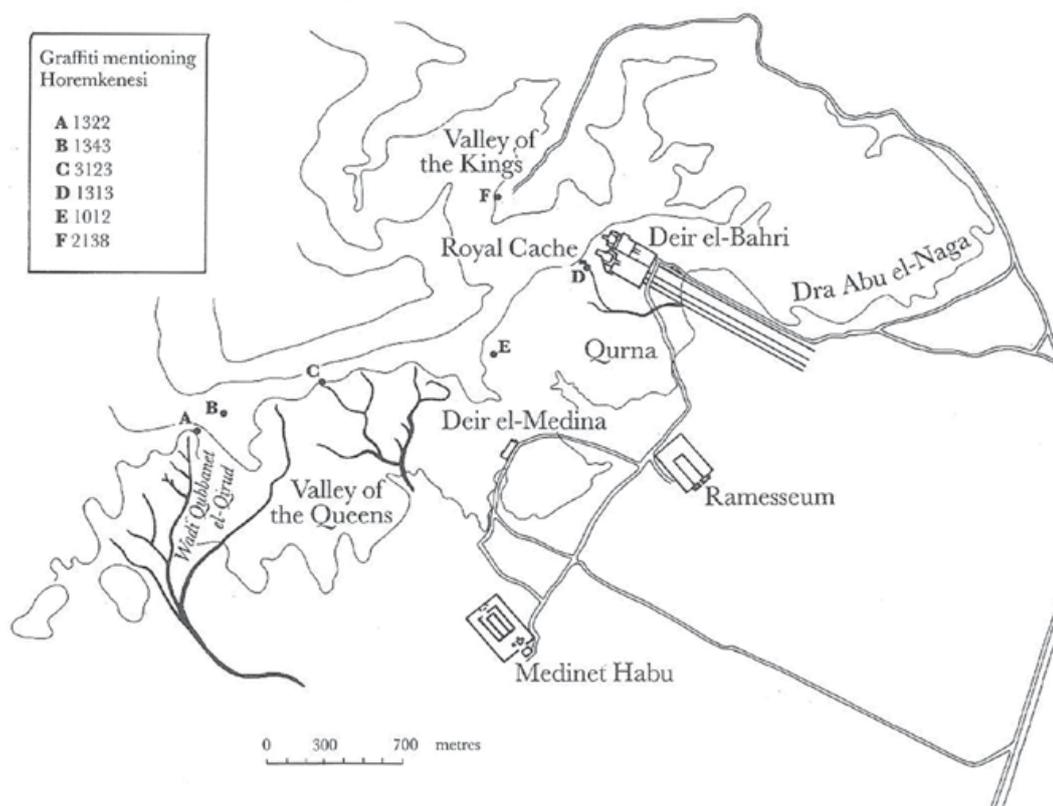


Figure 32 - Royal cache at Deir el-Bahari (from J. Taylor, *Unwrapping a mummy*, fig. 19, p. 40)

(first century BC), described three main procedures, available according to cost.<sup>96</sup> The most expensive and effective method, reported above, involved the removal of brain through the nostrils as well as the abdominal content through an incision in the flank. The viscera were cleansed with palm wine and species to be sweeten after drying out in natron (Diodorus, I, 91). After anointing the body cavity, the incision was closed and stitched. Before being washed and wrapped in layers of bandages, the corpse was covered with natron in dry powder and not immersed in a liquid natron bath as animal experiments demonstrated a quick disintegration in an unpleasant mess.

<sup>96</sup> There are not known Egyptian descriptions of the technical processes involved in mummification, except some wall scenes in Thay and Amenomopet's tombs, TT 23 and 41, and a few vignettes painted in various coffins and canopic jars. The associated rituals are described in P. Boulaq 3 in the Cairo Museum and P. 5158 in the Louvre. We have another incomplete source: P. Rind, from the Roman Period, that described many details of mummification. The S. SAUNERON's book, *Le rituel de l'embaumement*, Cairo, National Printing House, 1952, is dedicated to a bull embaumment.

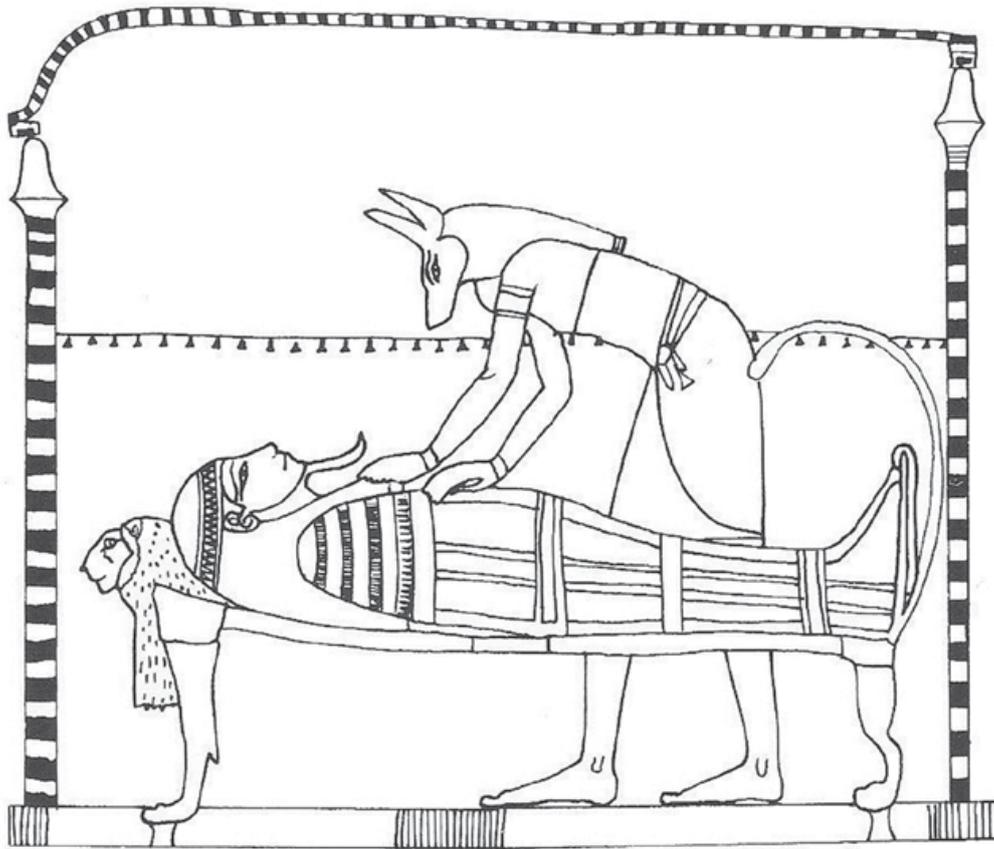


Figure 33 - Mummification process, Anubis the patron god of embalmers, Sennedjem Tomb, XIXth Dynasty (from B. Adams, *Egyptian mummies*, fig. 16, p. 12)

In the second method cedar oil<sup>97</sup> was injected into the rectum, which dissolved entrails and was drained off with the liquified viscera, then treatment with natron followed. Andrew Wade, an anthropologist of the University of Western Ontario, and his team have denied the use of cedar oil enemas and suggested that the innards of both rich and poor seem to have exited through an abdominal slit.<sup>98</sup> Employed in mummification of certain Apis bulls or other animals seen as physical manifestation of specific gods,<sup>99</sup> this practice was still applied to fauna, but rarely pets (fig. 35). Wade did not make any reference to animals as his studies were based on CT scans and

<sup>97</sup> Byblos provided the Egyptian's resin, a by-product early in demand for mummification, as well as timber from the coniferous forests of the Lebanon, B. KEMP, "Old Kingdom, Middle Kingdom and Second Intermediate Period c. 2686-1552 BC", in B. TIGGER, B. KEMP, D. O'CONNOR, A. LLOYD, *Ancient Egypt: a social history*, Cambridge, Cambridge University Press, 1983, chap. 2- p. 71-182, p. 145.

<sup>98</sup> A. WADE; A. NELSON, *op. cit.*

<sup>99</sup> G. PINCH, *Egyptian Mythology: a guide to the Gods, Goddesses and Tradition of Ancient Egypt*, Oxford, Oxford University Press, 2004, p. 37-40.

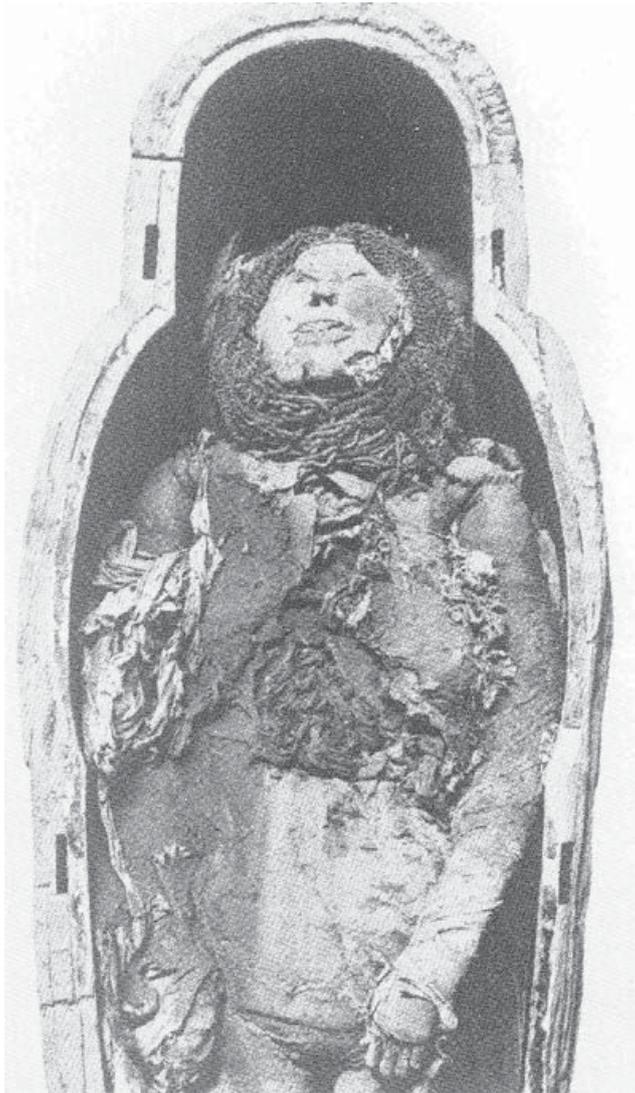


Figure 34 - Queen Henttawi: use of packing materials under the skin, XXIst Dynasty anthropoid coffin (from B. Adams, *Egyptian mummies*, fig. 41, p. 46)

saved from pillaging.<sup>101</sup> During the Ramesses XI reign, 45 workmen in the royal necropolis were arrested and tortured and, after confessing, brought to trial, being 38 sentenced to death. Under Twenty-first Dynasty (1070-945 BC), these violations horrified the priest-kings, and proper precautions were taken for safeguarding the mummies. They were moved to secret hidden places after re-wrapping and restoring damages, placed in a deep shaft of Deir el-Bahari tomb cache (fig. 32) and also re-buried in the tomb of Amenophis II. Observing these remains, restorers noticed that, despite the excellent New

3D reconstructions of seven mummies.<sup>100</sup>

The third most economical process required a treatment with natron because not all mummies were eviscerated. The archaeological evidence provided a considerable variation in the techniques at different periods.

The king mummies were completely covered in gold and coffins with gold and silver leaves and inlaid with semi-precious stones. Therefore, grave robbers were present from the earliest times in Egypt and they carried this out with the builders' assistance. Although Nubian security guards were frequently posted in the cemetery area, and the chapel tombs were visited by mortuary priests once or three times a day, very few mummies were

<sup>100</sup> A. WADE; A. NELSON, *op. cit.*

<sup>101</sup> CH. EL MAHDY, *op. cit.*, p. 24-25

Kingdom practices, the result did not have a totally life-like appearance due to corpse desiccation.

Hence in the Twenty-first Dynasty, mummification reached its pick by modifying the technique and a more careful life-appearance was obtained by using packing materials under the skin. Hollows were cleverly filled out usually using mixtures of linen, fat, soda and sawdust, through various slits in the torso and limbs. Changes in these substances caused some bodies to swell over time. The condition of the skin, flesh, hair and even eyelashes is quite remarkable. Then the surface was often painted with artificial eyes inserted, so that a doll-like appearance was created. In the case of Queen Henttawi, her head was ornamented by an elaborate twisted black string coiffure (fig. 34). The viscera were henceforth wrapped in packages and placed again in the empty chest and abdomen.<sup>102</sup> Onion skins or whole bulbs were placed over the eyes or stuffed into ears, mouth, feet or body cavity,<sup>103</sup> perhaps a custom to stimulate the breathing in the Sokaris' Festival.

From this period on, i.e. the Twenty-second Dynasty (945-712 BC), this art went into a gradual decline. Less attention was paid to the the body condition, speedily and ineptly embalmed, but the wrapping external appearance was carefully tended. When the first Greek settlers arrived and with Alexander the Great and Ptolemies (724-30 BC), the rapid decomposition by negligence resulted in incomplete bodies. In Roman times (30 BC-395 AD), narrow bandages were used, arranged in patterns with diamond-shape effects (fig. 36) and sometimes an encaustic wax portrait was placed over the face (fig. 37). A garish type coffin came into use and showy cartonnage coverings were formed and painted. Internally, some parts were lost, mixed with pieces of other corpses or replaced by artificial model.



Figure 35 -  
Mumified  
animal (from A.  
SPENCER, *Death  
in ancient Egypt*,  
pl. 35)

<sup>102</sup> PORPHYRY, (*De Abstinencia* II, 55), have also some references to the subject and wrote that the entrails were removed separately and placed in a chest (*kibotos*) but later, when returned to the body cavity, small wax figures of the sons of Horus were placed near the packages of viscera.

<sup>103</sup> E. SMITH, *A Contribution to the Study of the Mummification in Egypt*, MIE 5, (Cairo, 1906), p. 30-32.

We do not know exactly when mummification ceased, perhaps as a consequence of Christian customs, but scientific methods and new technologies are now being applied to ancient remains such as the scientific palaeopathological technique to study nutrition and diet as social practices.<sup>104</sup> Actually, the unwrapping should be only the last resource since the exposure to air could disintegrate them. Much can be learned by X-rays, CT-scanning, endoscopic technique as well as minimally-destructive chemical, physical and biological methods (stable isotopes, trace metals, and DNA), which leave the mummy intact.<sup>105</sup> These studies have provided rich information about ancient people's health and life expectancy. An Egyptologist, Dr. Bob Brier, has been the first modern scientist trying to recreate a mummy in 2000 using the ancient methods but nothing new was added to previous knowledge.

#### EGYPTIAN MUMMY CHRONOLOGY

- Predynastic- Badariense (4400-4000 BC): defleshing corpses, fetal position
- Predynastic- Naqada II-III (4000-3200 BC): dismembered corpses
- Late Predynastic (3500-3100 BC): first natural mummies known
- Early Dynastic (3100-2613 BC): first artificial technique: linen wrappings
- Fourth Dynasty (2613- 2498 BC): embalming process in extended body: extraction of viscera
- Fifth Dynasty (2498-2345 BC): virtual portrait statues
- Fifth-Sixth Dynasties (2498- 2181 BC): mummification widespread to lower status people, viscera packages, canopic jars



Figure 36 - Elaborated bandaging with diamond-shape effects of Roman Period (from A. SPENCER, *Death in ancient Egypt*, pl. 20)

<sup>104</sup> S. TARLOW, L. NILSSON STUTZ, *The Oxford handbook of the Archaeology of Death & Burial*, Oxford, Oxford University Press, 2013, p. 10.

<sup>105</sup> J. TYLDESLEY, *The mummy: unwrap the ancient secrets of the mummies' tombs*, New York, Carlston Books, 1999, p. 104-25, n 55; N. LYNNERUP, "Methods in mummy research", *Anthropol. Anz.* 67 (4), December 2009, p. 357-384.

- Eleventh Dynasty (2060-1991 BC) new improvements: rapid dissection with dry natron; buried in sand, cheaper method of drying, tissue preservation with oil or resin; removal of organs by injection into anus
- Twelfth Dynasty (1991-1782 BC): extraction of viscera, except for heart and kidneys; interior cavity stuffed with linen; god heads in canopic jars.
- New Kingdom (1570-1070 BC): seventy days and three different processes according to economical status; brain removing; saving nails.
- Twenty-First Dynasty (1070-945 BC): mummification reached its peak, a doll-like appearance
- Third Intermediate and Late Period (1070- 30 BC): decadence and inept embalming
- Roman Period (30 BC-395): mummy encaustic portraits

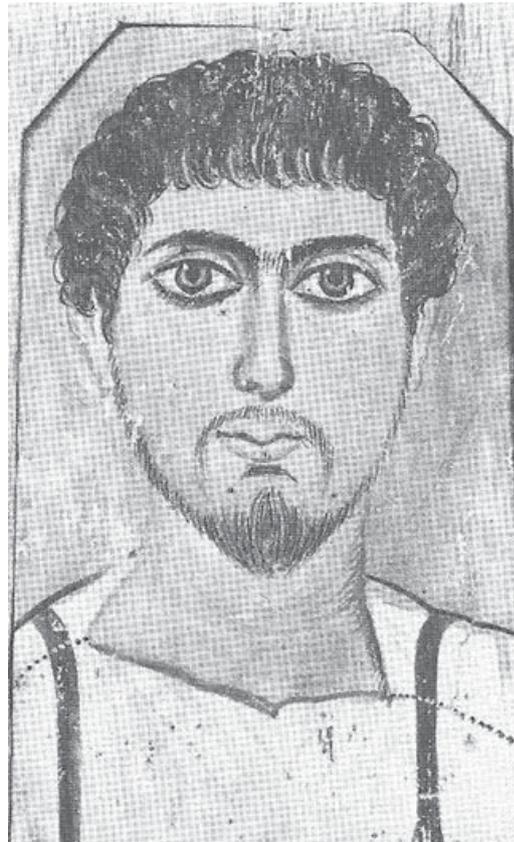


Figure 37 - Encaustic portrait of Roman mummy (from A. SPENCER, *Death in ancient Egypt*, pl. 31)

## CONCLUSIONS

In conclusion the New World was more advanced in the process of mummification than the Old World because:

Undoubtedly Chinchorro natural mummies (7000 BC), painted in ochre, under environmental conditions from Pacific coast cemeteries, take precedence over Egyptian natural ones (3500 BC), placed in desert cemeteries. Here this process finished soon, being corpses separated from the enclosing sand. Both wrapped the burial in animal skins without evidence of internal modifications.

Chinchorro, the first people in the World to practice artificial mummification (5000 BC), applied complex internal and external treatments and

technique variations. Meanwhile, Egyptian artificial interventions were restricted to linen wrappings (3100-2613 B C) without evisceration.

In Chinchorro culture the mummification was applied to all individuals c. 5500 BC but fetuses, neonates, lactating women and children were the favorite. In Egypt only royalty was preserved (3100-2613 BC) at first covered in gold and coffins inlaid with semi-precious stones but later the technique widespread to lower status level c. 2498- 2181 BC, being only the body orifices closed with gold, sometimes replaced with golden pills or honey tablets.

Black Chinchorro mummies (5050-2500 BC) were completely dismembered, stripping flesh, skin and tissues. The brain, removed by cutting the skull in half, was dried and tied back together. Almost at the same time (4000-3200 BC) defleshing and dismembered corpses without head were also found in Predynastic Egypt, without reassembling later. Only in one case the brain was removed from the skull base but since 1500 BC, the common technique involved brain extraction through the nostrils with a metal chisel.

Another Chinchorro characteristic, after the evisceration, was the desiccation by heat, the abdominal cavity treated with natural materials, grass and vegetable or animal fibers, and the body shaped and reinforced with clay. Instead, in Egypt, around 2613-2498 BC dehydration was rapidly made with dry natron or simple sand and cavities were packed with resin-soaked linens. Oils were applied to restore skin elasticity and later in the Eleventh Dynasty (2060-1991), an oleo-resin enema dissolved viscera.

The Chinchorro task concluded plastering the reassembled bodies with a white ash paste, modeling genitalia and placing a clay mask over the face with a short black human hair wig. In Egypt, from 2613 to 2498 BC, modeled face was sometimes painted with black hair, green eyes and red mouth and the male sex organs, shaped in cloth, were put in place. Later (2181-2040 BC) face masks were often made in cartonnage but around 1070-945 BC a doll-like appearance was created with artificial eyes.

The resulted Chinchorro mummy statue, completely covered in clay, was wrapped in reeds, and left to dry out for 30-40 days. In Egypt, around 1570-1070 BC, the embalming sophisticated technique took about 70 days, removing the brain and saving the nails, but two more economical processes were carried out in fewer days.

Chinchorro reached a peak in 3000 BC, applying internal and external treatment to the whole body. In Egypt, the peak was in 1070-945 BC, using

packing materials under the skin through various slits in the torso and limbs and obtaining a more careful life-appearance with a remarkable condition of skin, flesh, hair and even eyelashes.

Red Chinchorro technique (2500-2000 BC) evolved practicing many incisions in the trunk, arms and legs to eviscerate and dry the body cavity while the head, always cut to remove the brain, was covered with an open eye clay mask and a wig of 60 cm. long human hair tassels. In Egypt (1570- 1070 BC), viscera were removed by an incision in the flank, and lungs and other parts by cutting the diaphragm; except for the heart, 'the seat of the mind'.

Chinchorro used black manganese or red ochre (5050-2000) to paint corpses. In Egypt (1570- 1070 BC), resin applications gave dark appearance; the head was painted in red, black or yellow. By Persian and Greco-Roman periods, black resin like bitumen was used to consolidate damaged bodies.

The only three infants in Chinchorro bandage technique<sup>106</sup> (estimated around 2620-2000 BC), a mixture of black and red mummies, were wrapped in animal and human skin, their heads were painted with black manganese while their bodies in red ochre. In Egypt from 2181 to 2040 BC, bodies were wrapped in linen, some with cartonnage face masks, custom widespread before and after these dates.

**Decadence:** In Late Chinchorro, including Quiany Period (1880 - 1100 BC), people returned to natural desiccation. In Late Egyptian times (945-30 BC), it was common inept embalment of decomposed corpses by negligence resulting in incomplete bodies with artificial models, and lost parts were mixed with other members. During Roman Egypt (30 BC-395AD), more attention was paid to exterior appearance above all to diamond-shaped bandages with an encaustic wax portrait.

## DIFFERENCES

Limbs and spine were strengthened with sticks in Chinchorro culture to reinforce bodies and in a final style (3000-1300 BC), mud-coat mummies molded on clay were cemented into their graves, the soil evolution acting as cementing agent.

Chinchorro soft tissues, just removed, were buried in the westlands or the ocean while the dry parts were placed in the desert.

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<sup>106</sup> B. ARRIAZA, "Tipología de las momias Chinchorro y evolución de las prácticas de momificación", *Chungara, Revista de Antropología Chilena* 26 (1), 1994, p. 11-47.

In Egypt (2613- 2498 BC), the use of an alabaster box or any container to embalm viscera, particularly the liver, intestines, lungs and stomach, for the royalty, was later replaced (2498- 2181 BC) by canopic jars for lower classes. But in the Twenty-First Dynasty (1070-945 BC) they were returned into the body cavity after being dried out in natron and cleaned with spiced palm wine.

Onion skins or whole bulbs were placed over the eyes or into the ears, mouth, feet or body cavity, perhaps to stimulate the dead to breathe in the Sokaris' Festival.

Animal mummification was very common in Egypt.

Certainly, we can say that the New World mummification arose independently and prior to its development in the Old World. However, some particular methods were used for both cultures with a gap of time, but Egypt perfected this art due to the advances in its medical science. Finally, both civilizations abandoned these complex practices, perhaps because they were expensive, took a long time or were deprived of their religious support.

#### SAŽETAK

*U starom i novom svijetu postojao je običaj da se tijelo očuva na prirodan i na umjetan način. Od paleolitika čovjek vjeruje u zagrobni život te čak u srednjoameričkim i andskim kulturama, se pokop mrtvih prakticirao uz pažnju i svečanost kroz kult predaka. Pogrebni rituali razvijeni su u preddinastičkom Egiptu (4500–3100 pr. Kr.) Pogrebni su postupci razvijeni, ali su se očito počeli i prije, u Americi oko 5000 godina pr. Kr.*

*Mumije su služile kao oslonac duši za opstanak i za sprečavanje zastrašivanja mrtvih od strane živućih. Inke su stigle do točke savršenstva u tim postupcima nakon drugih andskih kultura, ali ne smijemo zaboraviti njihove starije prethodnike, Chinchorro kulturu na sušnoj obali pustinje Atakama. Različiti stupnjevi u tehnicima mogu se razlikovati u oba svijeta: prirodno sušenje i pokrivanje životinjskom kožom, metode zaštite tijela; uklanjanje kože i mesa, zamjena s glinom; u crno, crveno ili u blato obloženi leševi, vađenje utrobe, tretiranje tjelesnih šupljina, čišćenje i premazivanje unutrašnjosti, uklanjanje mozga, mumificirana tijela, leševi prekriveni natronom (prirodnom sodom), prije pranja i umatanja u zavoje ili zamatanja.*

*Potrebno će biti da pažljivo provjeriti datume, tehnike i razdoblja u obje zone kako bi se precizno utvrdila evolucija primjenjivanih metoda.*

**Ključne riječi:** mumifikacija; antički i novi svijet; metode i prva namjerna tehnika