An Evaluation of the Human Skeletal Remains and Artifacts Found in the Tomb of the Eagles on the Orkney Islands

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Abstract

The Tomb of the Eagles is formally known as the Isbister Chambered Tomb. It is located north of Scotland on the remote southeast coast of South Ronaldsay Island, one of the Orkney Islands. The tomb was minimally excavated in 1958. When thoroughly excavated in 1975, a significant collection of human remains, artifacts and animal bones was discovered. This study of the Isbister remains summarizes the state of health enjoyed by the people who lived on this island more than 4000 years ago.

Introduction

The Neolithic period Tomb of the Eagles is officially identified as the Isbister Chambered Tomb. It is located almost due north of John O'Groats and Duncansby Head in Scotland on the southeast coast of South Ronaldsay Island, the southernmost major island in the Orkney archipelago (Henshall, 1963). In 1958, a minimal excavation of the tomb by Ronald Simison, owner of the farmland, revealed many interesting objects. His curiosity and diligence provided the impetus for a thorough excavation of this well-preserved burial place in 1976, and later restoration of the tomb in the following years (Hedges, 2000). A significant amount of information concerning the life and death of the Orkney people has been obtained from the contents and construction of the tomb that archaeologists believe was constructed over 4000 years ago. The Isbister tomb is one of seventy-six known chambered tombs in the Orkney Islands (Fraser, 1983) that, together with stone houses, standing stone circles and monuments, were built in the same period (Ritchie, 1978).

Description of the Isbister Chambered Tomb

The early people of the Orkneys built numerous structures that demonstrate an advanced understanding of engineering, astronomy and mathematics (Thom, 1971). The spectacular setting of the Isbister tomb is about 220 feet from the precipitous cliffs by the sea. Its entrance overlooks the Pentland Firth that separates the northern coast of Scotland from the Orkney Islands (Noonan, 2000). Archaeologists consider this chambered tomb to be one of the most splendid found in the region and believe it gives evidence that they had great respect for the value of life. The rock structure has a sophisticated architectural design that required a great deal of skill and an intimate appreciation of building materials. The design and placement of stones for the doors, walls and roof required workers with exceptional talent, especially since it is assumed that only primitive tools were available to move dirt and rock for site preparation and construction of the tomb and retaining walls (Figure 1).

A great flagstone forecourt surrounded the Isbister Tomb. The exterior was oval-shaped with more or less vertical walls that were 3.5 meters tall and a single entrance on the long wall closest to the sea. The floor area of the interior, including two small end chambers, was in the shape of a long rectangle about 8.33 X 1.45 meters; the height was around 3.5 meters (Figure 2). The roof was a sloping dome with the highest point in the center of the chamber. Three small chambers were built off the long sides of the chamber, two on the side opposite the entrance and one on the long wall to the right of the entrance. Two small chambers, each with a built-in stone shelf, were located at either end of the long section of the chamber (Hedges, 2000).

According to calibrated radiocarbon dates, construction of the Isbister Chambered Tomb began in 3150 B.C. (80

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Figure 1. The Isbister Chambered Tomb

years) and may have taken as much as two hundred years to complete. This date precedes construction of the pyramids of Egypt and is shortly after the recorded dispersion of people groups from the City of Babel (The Bible, Genesis 11). Archaeologists believe the tomb was used regularly for 800 years, with the last burial around 1600 B.C. (Hedges, 2000).

Contents of the Isbister Chambered Tomb

A limited excavation of the northern interior of the Isbister Chambered Tomb took place in 1958. A number of human skulls and bones were removed from the tomb for safekeeping. A photograph of this collection shows sixteen human skulls, six boxes that presumably contained bones, a portion of a pelvis and four or five femurs. Four small fragments of pottery were also removed before the excavated area was filled with dirt (Hedges, 2000).

In 1976, Ronald Simison initiated and completed an extensive excavation of the entire tomb. An enormous amount of material was removed, including human bones, animal bones, shells, fragments of pottery suitable for cooking, tools, seeds, necklace beads and a V-bored very highly polished jet button (Figure 3) (Henshall, 1963). Many talons and bones from white-tailed sea eagles were found mixed with the human bones and so, the Isbister Chambered Tomb is also called the Tomb of the Eagles.

A remarkable finding concerning the bones in the tomb was the absence of intact skeletons. Rather, piles of bones associated with a skull were arranged along the sides of the stalls (Figure 4). In the side chambers, the floor was filled with skulls lying at all angles and mixed with bones from other parts of the body. In addition, the bones were bleached and weathered. This arrangement and condition of bones made it obvious that the soft tissue of the deceased was missing when the bones were brought into the tomb (Hedges, 1998). This mortuary practice is called excarnation, a custom that people groups around the world have practiced in various forms for thousands of years (Renfrew, 1979).

The human bones removed from the tomb were sent to Edinburgh for analysis by Judson T. Chesterman, a retired surgeon working for the Department of Prehistory and Archaeology at the University of Sheffield. Including

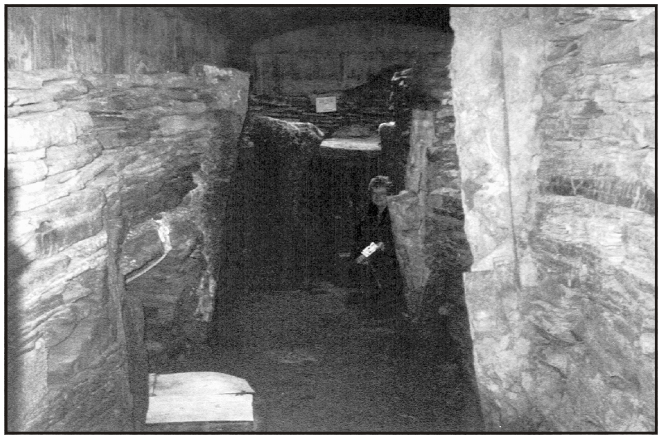

Figure 2. Interior of the Isbister Chambered Tomb.

Figure 3. Highly polished button from the Isbister Chambered Tomb.

[1]This term and other anatomical terms are defined in a glossary located at the end of this paper.

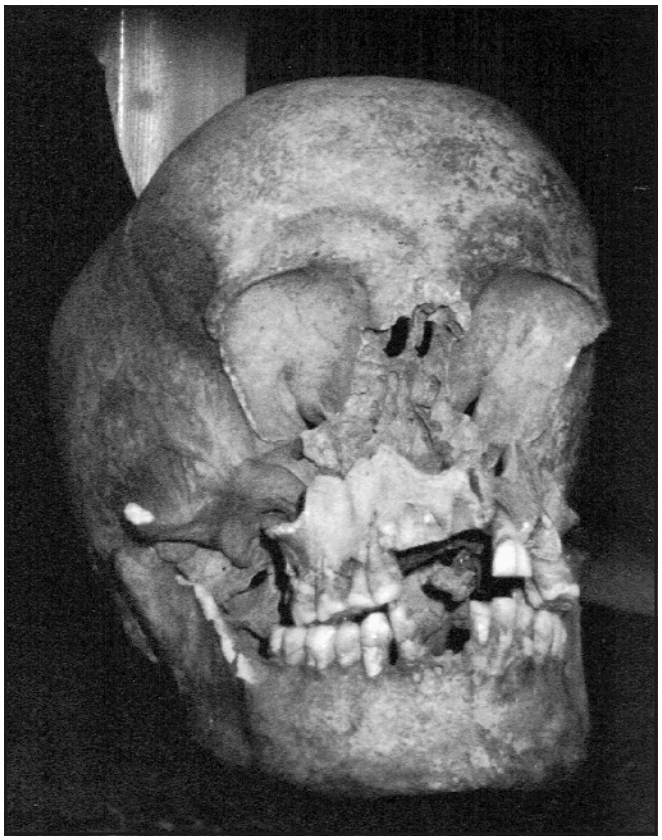

Figure 4. Human skull from the Isbister Chambered Tomb.

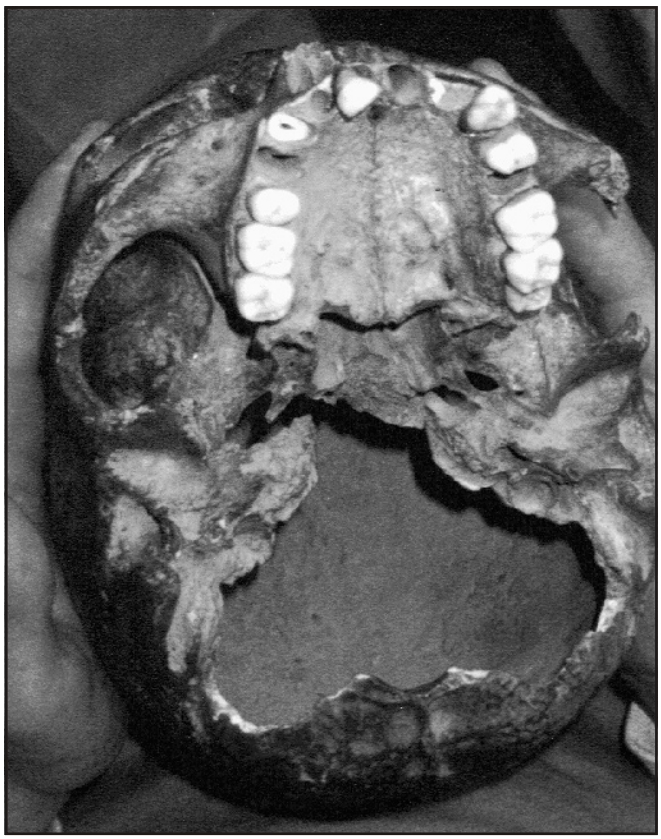

Figure 5. Remarkably healthy teeth showing wear but little caries.

the remains obtained in 1958, there were 16,000 human bones and fragments that required evaluation. In 1981, Chesterman reported that bones of at least 342 individuals were recovered from the Isbister Chambered Tomb (Hedges, 2000). This investigator has also evaluated the human remains removed from other ancient burial sites in the United Kingdom (Renfrew, 1979).

Even though the builders of the tombs, houses, villages and standing stones possessed advanced engineering skills and an understanding of astronomy and mathematics, there is no evidence that they had yet developed a written language.

Evaluation of the Human Skeletal Remains

The condition of the skulls and other bones removed from the Isbister Tomb were in a range from intact and perfect, to incomplete fragments. Presumably, this was the result of post-mortem manipulation by the people who originally placed them in the tomb and the crushing weight of earth and rocks intentionally placed over them at burial. Additional damage to the remains may have occurred during the removal process, in storage, or in transit to the examiner, Judson Chesterman. As a result, the accuracy of the evaluation may have been compromised to some degree by the incomplete condition and damaged condition of the skulls and bones.

The examination revealed that some skulls, mostly female, exhibited a markedly increased attachment of the neck muscles to the back of the skull. In these same instances, a visible depression running laterally across the top of the cranium was noted. These findings were interpreted to mean that both anomalies resulted from individuals carrying loads on their back supported by a band over the head (Hedges, 2000).

Elizabeth J. Glenn from Ball State University in Indiana independently studied the Isbister skulls. In comparing these specimens to others from both the British Neolithic and Bronze Age, she reported that the females had noticeably smaller heads than males, but that the males tended to have longer heads anteroposteriorly than females. She also concluded that these people would have been visually distinguishable from those living further south in the British Isles, probably the result of a slightly different genetic make-up in their ancestry (Hedges, 2000).

Chesterman discovered a possibly inherited peculiarity on the articulating surfaces of the occipital *condyles* (this and other anatomical terms are defined in a glossary

located at the end of this paper) with the atlas in the Isbister skulls. Each occipital condyle normally has only one facet and the occurrence of two facets on one or either side is highly unusual; evidence of the normal distribution lies in a study of 585 skulls from different countries and periods that describes only five instances of this unusual trait in 1,144 articulations. In contrast, thirty of the occipital condyles showed two facets in the Isbister skulls, and one skull even exhibited a triple facet. Thus, more than a third of the Isbister skulls demonstrated this rare anatomic configuration. (Hedges, 2000)

Another unusual occurrence in the Isbister remains was the precocious closure of the sutures of the skull. The normal distribution of this anatomic anomaly is about five in 10,000 births, whereas there were six examples of this phenomenon in the meager number of Isbister skulls. In a related matter, degenerative spinal disease was diagnosed in at least 47% of the individuals and, in one male believed to be 45–50 years of age, a 14-mm. thick skull exhibited asymmetry of the foramen magnum. (Hedges, 2000)

For the most part, the dentition of the remains seemed remarkably healthy. Although the occlusal surfaces of some teeth demonstrated extraordinary wear, dental caries was not a common finding (Figure 5). Out of 1537 teeth examined, only nine had deep carious lesions and merely five posterior teeth exhibited periapical abscesses. On the other hand, many mature individuals showed minor to moderate generalized resorption of the alveolar bone, a finding commonly associated with periodontal disease. Even though the examination revealed impaction of six third molars and three canine teeth, a greater than average absence of third molars was noted in the specimens. The skull of a thirty-five year old female exhibited a palatal lesion associated with a canine measuring 28 X 18 X 18-mm; it appeared to be benign, most probably a cyst. The shovel-shaped maxillary central incisor is a rare occurrence, but this anomaly was identified in one out of seventy-seven skulls. Malpositioned or misaligned teeth were found in some skulls and temporomandibular joint disorder was exhibited in three males and two females (Hedges, 2000).

The large number of human bones in the tomb allows for a meaningful description of the size, gender and age of these ancient people. The average male was 5 feet 7 inches tall (range: 63 to 70 inches) whereas the average female was 5 feet 3 inches tall (range: 58 to 64 inches). Both genders appeared to have been muscular and an alteration in the bones of the ankle may have been the result of scaling the surrounding cliffs from an early age. Two percent of the individuals suffered a broken bone at some stage in their life, but accidents appeared to be a relatively minor cause of death since most of the broken bones were healed. Out of the 179 teenagers and adults, 80 were male and 39 were female, while the gender of the 60 others could not be determined. Even though calculation of the age of human remains by examination of bones and teeth is imprecise (biological rather than chronological), estimates of the 342 individuals buried in the tomb were as follows: 24 died before the age of two, 70 died between two and twelve, 63 died as teenagers, 185 died as adults. And so, it is believed that few people in the Isbister community lived to the age of fifty, that large numbers died at an early age, and that the average life expectancy was around twenty years (Hedges, 2000).

This review is based solely on the bones of 342 individuals who were buried in the Isbister Chambered Tomb. However, it is not believed to be the only burial place for people who lived on this island during this time period. The physical characteristics of these other individuals and how the bodies were treated are not known (Hedges, 2000).

Conclusion

The remains buried in the Isbister Chambered Tomb provide physical evidence of the people who populated this area 4000 years ago. Their bones and teeth demonstrate the presence of health, injury and disease. Estimates of age indicate that their life span was much shorter than modern day man.

The quality of life experienced by these people is partially revealed by their ability to construct substantial structures with primitive materials. The extraordinary effort displayed in construction of this tomb, and at least 75 other tombs in the Orkneys, gives ample proof that they had an advanced understanding of engineering, astronomy and mathematics, and a great respect for the value of life. Their artifacts also demonstrate a high level of expertise in the use of a drill to perforate and polish hard rock into jet buttons, and the ability to make pottery in a manner that allowed it to be used for cooking.

Despite these advancements, there is no evidence that they possessed a written language. This should not be unexpected since most peoples of the same era (the dispersed people of Babel) also had no recorded language skills. In fact, the Isbister people could possibly be a part of this dispersion.

The human bones discovered in the Isbister Chambered Tomb reveal that these people experienced energetic lives of health, but also encountered many of the injuries and diseases that afflict contemporary society.

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Glossary

alveolar bone: the portion of the maxilla or mandible that forms the dental arch and serves as a bony support for the teeth.

articulations: the place of union or junction between two or more bones of the skeleton.

atlas: the name of the first cervical vertebrae supporting the skull or head.

carious lesion: an area of tooth decay resulting in an alteration in the continuity of tooth structure.

facet: a small smooth flat surface on a bone or tooth.

foramen magnum: a large, oval opening in the inferior and anterior part of the occipital bone. It serves as a communication between the cranial cavity and the vertebral canal.

impaction: the condition in which the eruption of a tooth is prevented because it is blocked by a physical barrier or another tooth.

occipital condyle: one of the two oval bony processes adjacent to the foramen magnum in the occipital bone that articulate with the atlas.

occlusal surfaces: the main chewing surfaces of the posterior teeth.

palatal lesion: a pathologic disturbance of the hard or soft tissues that separate the oral cavity from the nasal cavity.

periapical abscess: an inflammation of the tissues surrounding the root tip of a tooth and characterized by a local accumulation of pus. It is generally a sequela of tooth pulp death.

periodontal disease: disease of the supporting tissues of the teeth which may lead to gum recession or shrinkage and loss of alveolar bone.

shovel-shaped maxillary central incisor: an unusual condition of the inside of an upper front tooth where the marginal ridges and cingulum are larger than normal.

suture: an articulation in which two contiguous bones of the skull are united by intervening periosteum.

temporomandibular joint: one of the two joints between the temporal bone of the cranium and a condyle of the mandible. The joint is enclosed in an articular capsule and its surface is lined with fibrocartilage.

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Book Review

Genesis of the Big Bang by Ralph A. Alpher and Robert Herman
Oxford University Press, New York, NY. 2001. 214 pages, $21.95.

This book is written by two of the originators of the Big Bang model for the origin of the universe. The authors together with George Gamow took some of Gamow's early (pre 1946) ideas on the origins of the universe, especially cosmic nucleosynthesis of light elements, and developed a general relativistic model for the expanding universe. These three first published results of their nucleosynthesis calculations and this model in the April 1, 1948 issue of *Physical Review*. In that article they predicted a cosmic background radiation at a temperature less than 10 Kelvins. Refinements on the model since that time have brought it into remarkable agreement with the measured