

Nature of Science & Math:

Analyzing the Presence in Everyday Communication

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Abstract

This paper explores the Nature of Science and Math in an article found from National Geographic. The article from National Geographic discusses the Inca children who were found in 1999 mummified in the mountains of *Volcán Llullaillaco* in Argentina. The information presented will be based on the following tenets of Science: Scientific knowledge is Based on Empirical Evidence; Scientific Knowledge is Open to Revision in Light of New Evidence; and Science is a Human Endeavor. In addition, the following Mathematical Practices will be discussed: Use appropriate tools strategically; Model with mathematics; and Attend to precision.

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Three children from the Inca Empire were found in 1999 mummified in the mountains of *Volcán Llullaillaco* in Argentina. The article discusses the study on the remains of the oldest child (13 year old) Llullaillaco Maiden as an overview of what the scientists were able to interpret from her hair. The children were found in excellent condition due to their natural preservation from the temperature and air quality in the mountain summit. The Inca children were thought to be a sacrifice for an ancient ritual called *capacocha*.

Scientific Knowledge is Based on Empirical Evidence

Through biochemical and technical analysis, the scientists were able to collect data from the Maiden's hair. The analysis allowed the scientists to track her life prior to the sacrifice. The scientists were able to gain insight and make interpretations on how much alcohol and coca she consumed up until her death. In addition, they were able to suggest the change in the Maiden's diet for approximately a year to two prior to her death.

Scientific Knowledge is Open to Revision in Light of New Evidence

In the article, there is a reference to Spanish explorers writing historical chronicles of the Inca rituals they witnessed. Due to the advances in technology and analysis, the scientists were able to gain evidence to support those written chronicles. Even though revision of previous thought was not the end result in this case, the data supported the written description. "Now the data appear to match the kinds of events described in the chronicles..." (Handwerk, 2013 This idea is solidified according to the article *The Nature of Science in The Next Generation Science Standards*, "With the addition of historical examples, the nature of scientific explanations assumes both a human face and is recognized as an ever-changing enterprise." (2013)

Science is a Human Endeavor

Various scientists from different backgrounds made interpretations about the Maiden's life and diet. Current technological advances helped the scientists to make these interpretations of her life prior to death. There were many scientists from different backgrounds stated in the article such as archaeologist, biochemical, and forensic.

Use Appropriate Tools Strategically

The scientists gathered data from the Maiden's hair to make an explanation in the context of her life prior to death along with the archaeological findings of the Inca Empire. The scientists had to use many tools, strategies, and/or formulas to quantify their findings. As stated in Appendix L of the Next Generation Science Standards, "These tools, and the skill and judgement to use them well, are important for quantitative work in science." (2013)

Model with Mathematics

As stated previously, the scientists were able to make a timeline model of the Maiden's life prior to her death through the data collected in the analysis of her hair. Since "hair grows about a centimeter a month..." (Handwerk, 2013), the scientists could analyze each centimeter piece as time markers. "For example, scientists cannot go the center of the Earth, yet they develop a model of what is there based on other observations." (Schwartz, 2007)

Attend to Precision

When analyzing the Maiden's hair, the scientists had to be precise when measuring. As stated above, hair grows at a certain rate of change. In addition, the scientists had to be precise in gathering data from each one centimeter piece of hair. In conclusion, the scientists had to think critically, use science, math, and technology to piece together the life of the 13 year old girl Lulluillaco Maiden.

References

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