Machu Picchu

Source 1: The Stones of Machu Picchu

by Duane Damon

1 On a steamy July afternoon in 1911, American explorer Hiram Bingham pushed aside a tangle of undergrowth and stared. For long weeks he had scoured the sweltering jungles of eastern Peru for clues. A casual remark from a native farmer . . . the hint of a trail long unused . . . a glimpse of pale stone through the trees . . . all were "ghosts" of an ancient Inca[1] city lost among the soaring peaks of the Andes Mountains long ago. Now, some two thousand feet above the rushing Urubamba River, Bingham was at last face-to-face with the find he had been seeking.

2 "Suddenly I found myself confronted with the walls of ruined houses built of the finest quality of Inca stonework," he recorded later. "It was hard to see them, for they were partly covered with trees and moss, the growth of centuries." Bingham stared in amazement at the "walls of white granite ashlars [stone building blocks] carefully cut and exquisitely fitted together." The larger stones appeared to weigh 10 to 15 tons. How had they been moved? Did they stay together without the application of mortar?

3 Bingham, his nine-year-old native guide, and his military escort swarmed over the ruins. The explorer gaped in awe at a huge altar carved from the mountainside itself—the *intihuatana*, or "hitching post of the sun." He marveled at *El Torreón*—a graceful semicircular "tower." A pair of three-sided temples with triple windows held him "spellbound." Bingham methodically snapped photos, scribbled notes, and sketched maps. All the while his hopes rose. Had he found it? Could these long-forgotten ruins be the remains of Vilcabamba, the last capital of the Inca?

4 Bingham was not the first white man to examine the Inca civilization. After its takeover by the Spanish conqueror Francisco Pizarro in the 1530s, men like Pedro Cieza de León, a soldier, and Father Bernabé Cobo, a Jesuit missionary, recorded their impressions of Inca rituals, social structure, and engineering. Bingham's fascination had begun as a professor of Latin American history at Yale University in New Haven, Connecticut. The present expedition had been funded by his former classmates, who wanted to solve a 400-year-old mystery: the location of Vitcos, or Vilcabamba. This city was the secret stronghold built by the Inca ruler Manco II after he fled the Spanish Conquest in 1535.

5 Bingham now believed that he had found it—but not for long. Only a few days later, he came upon a larger set of ruins, some 60 miles away. This site, Bingham decided, must really be Vilcabamba. His earlier discovery was dubbed Machu Picchu, after the mountain over whose ridge it sprawled. Soon afterward, Bingham uncovered a third set of ruins, called Vilcabamba Viejo ("the old"), at Espíritu Pampa.

6 The following summer, Bingham returned to Machu Picchu . . .. Careful digging around its ruins yielded scores of Inca graves, some stone dishes, and several bronze implements. Tantalizing clues, yes, but intriguing

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[1] **Inca:** a South American civilization that was conquered by the Spanish in the 1500s

questions remained. What Inca chief had built Machu Picchu? When? Why? Bingham himself died uncertain as to which of his three discoveries had been the "lost" Inca capital.

7 Despite the mysteries surrounding it, Machu Picchu is recognized as one of the world's great archaeological wonders. Nestled in a breathtaking natural setting, the city's lasting beauty comes from the careful blending of its striking architecture with its mountaintop environment. Each year, thousands of fascinated visitors come to the "city in the clouds" to look, to reflect, and to wonder.

Source 2: Historic Sanctuary of Machu Picchu

by the United Nations Educational, Scientific, and Cultural Organization (UNESCO)

A World Heritage Site is a place (such as a forest, mountain, lake, monument, building, etc.) that is listed by the United Nations Educational, Scientific and Cultural Organization as being of special importance to the common heritage of humanity. UNESCO considers it in the interest of the international community to protect and preserve each site. The document was written by UNESCO in support of Machu Picchu as a world heritage site.

Outstanding Universal Value

8 Embedded within a dramatic landscape at the meeting point between the Peruvian Andes and the Amazon Basin, the Historic Sanctuary of Machu Picchu is among the greatest artistic, architectural and land use achievements anywhere and the most significant tangible legacy of the Inca civilization. Recognized for outstanding cultural and natural values, the mixed World Heritage property covers [79 acres] of mountain slopes, peaks and valleys surrounding its heart, the spectacular archaeological monument of "La Ciudadela" (the Citadel) at more than [7,800 feet] above sea level. Built in the fifteenth century Machu Picchu was abandoned when the Inca Empire was conquered by the Spaniards in the sixteenth century. It was not until 1911 that the archaeological complex was made known to the outside world.

9 The approximately 200 structures making up this outstanding religious, ceremonial, astronomical and agricultural centre are set on a steep ridge, crisscrossed by stone terraces[2]. Following a rigorous plan the city is divided into a lower and upper part, separating the farming from residential areas, with a large square between the two. To this day, many of Machu Picchu's mysteries remain unresolved, including the exact role it may have played in the Incas' sophisticated understanding of astronomy and domestication of wild plant species . . ..

10 Standing 2,430 m above sea level, in the midst of a tropical mountain forest in an extraordinarily beautiful setting, Machu Picchu was probably the most amazing urban creation of the Inca Empire at its height. Its giant walls, terraces and ramps seem as if they have been cut naturally in the continuous rock escarpments. The natural setting, on the eastern slopes of the Andes, encompasses the upper Amazon basin with its rich diversity of flora and fauna.

11 Machu Picchu [is] in some of the scenically most attractive mountainous territory of the Peruvian Andes. As the last stronghold of the Incas and of superb architectural and archaeological importance, Machu Picchu is one of the most important cultural sites in Latin America; the stonework of the site remains as one of the world's great examples of the use of a natural raw material to provide outstanding architecture which is totally appropriate to the surroundings. The surrounding valleys have been cultivated continuously for well over 1,000 years, providing one of the world's greatest examples of a productive man-land relationship; the people living around Machu Picchu continue a way of life which closely resembles that of their Inca ancestors, being based on potatoes, maize and llamas. Machu Picchu also provides a secure habitat for several endangered species, notably the spectacled bear, one of the most interesting species in the area. Other animals include: dwarf brocket, the otter, long-tailed weasel, pampas cat and the vulnerable ocelot, boa, the Andean cock of the rock, and the Andean condor. . ..

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[2] **terraces:** flat areas created on the side of a hill and used for growing crops

12 Machu Picchu is a world renowned archaeological site. The construction of this amazing city, set out according to a very rigorous plan, comprises one of the most spectacular creations of the Inca Empire. It appears to date from the period of the two great Incas, Pachacutec Inca Yupanqui (1438–71) and Tupac Inca Yupanqui (1472–93). . ..

13 Without making a judgement as to their purpose, several quite individual quarters may be noted in the ruins of Machu Picchu: a quarter 'of the Farmers' near the colossal terraces whose slopes were cultivated and transformed into hanging gardens; an 'industrial' quarter; a 'royal' quarter and a 'religious' quarter. Inca architecture reveals itself here in all of its force. . ..

Protection and management requirements

14 The state-owned Historic Sanctuary of Machu Picchu is an integral part of Peru's national protected areas system and enjoys protection through several layers of a comprehensive legal framework for both cultural and natural heritage. The boundaries of the Historic Sanctuary of Machu Picchu are clearly defined and the protected area is surrounded by a buffer zone[3] exceeding the size of the property.

15 The Management Unit of the Historic Sanctuary of Machu Picchu (UGM) was established in 1999. . . [and] is indispensable for the management of a property which forms part of Peru's very identity and is the country's primary domestic and international tourist destination. . ..

16 Tourism itself represents a double-edged sword by providing economic benefits but also by resulting in major cultural and ecological impacts. . .. The planning and organization of transportation and infrastructure construction, as well as the sanitary and safety conditions for both tourists and new residents attracted by tourism requires the creation of high quality and new long-term solutions, and is a significant ongoing concern.

1. **How does paragraph 1 in Passage 1 help develop a central idea of the passage?**
   A. It illustrates the skills and experience that Bingham needed to be successful in his search.
   B. It provides historical context to help the reader understand the importance of the discovery.
   C. It demonstrates the difficulty that Bingham had in uncovering the site and why the discovery was significant.
   D. It highlights the dangerous nature of searching for ancient archaeological sites and why most explorers gave up the search.

2. **What does the phrase "gaped in awe" reveal about Bingham as it is used in paragraph 3?**
   A. It suggests that he was astonished by what he saw.
   B. It illustrates his fear of the unusual artifacts that he had discovered.
   C. It implies that he was confused by the building methods of the altar.
   D. It emphasizes his exhaustion after his extensive search for the missing site.

3. **Read this sentence from Passage 1.**

   "Careful digging around its ruins <u>yielded scores</u> of Inca graves, some stone dishes, and several bronze implements." (paragraph 6)

   What does the phrase <u>yielded scores</u> mean as it is used in this sentence?
   A. shaped easily
   B. waited nearby
   C. explored often
   D. produced many

[3] **buffer zone:** a space that cushions against shock or damage due to contact

4. **Select two details from Passage 1 that support the idea that Bingham's search for Machu Picchu was a collective effort.**
   A. "For long weeks he had scoured the sweltering jungles of eastern Peru for clues." (paragraph 1)
   B. "'It was hard to see them, for they were partly covered with trees and moss, the growth of centuries.'" (paragraph 2)
   C. "Bingham, his nine-year-old native guide, and his military escort swarmed over the ruins." (paragraph 3)
   D. "Bingham was not the first white man to examine the Inca civilization." (paragraph 4)
   E. "The present expedition had been funded by his former classmates, who wanted to solve a 400-year-old mystery: the location of Vitcos, or Vilcabamba." (paragraph 4)

5. **Describe one characteristic of Hiram Bingham that contributed to his success in finding Machu Picchu. Use details from Passage 1 to support your response. In your elaboration, be sure to explain how your evidence proves your claim.**

6. **What is the meaning of the word <u>tangible</u> as it is used in paragraph 8 of Passage 2?**
   A. having long term value
   B. found with great difficulty
   C. physical proof of existence
   D. demonstrating dramatic beauty

7. **How does paragraph 10 contribute to the development of Passage 2?**
   A. It focuses on the idea that Machu Picchu was a very difficult structure to build.
   B. It clarifies how Machu Picchu provided the Incas with an understanding of wild plants.
   C. It emphasizes the marvel of Machu Picchu by describing its architecture and location in nature.
   D. It explains how the Incas intended to keep Machu Picchu hidden by describing how it was built into a cliffside.

8. **PART A**
   What is the central idea of Passage 2?
   A. Machu Picchu is of cultural importance.
   B. Machu Picchu is ideal for educational opportunities.
   C. Machu Picchu is a mystery due to its remote location.
   D. Machu Picchu is significant for connecting different civilizations.

   PART B
   Which phrase from paragraph 8 introduces the central idea in Part A?
   A. "the meeting point between the Peruvian Andes and the Amazon Basin"
   B. "the greatest artistic, architectural and land use achievements anywhere"
   C. "Machu Picchu was abandoned when the Inca Empire was conquered"
   D. "that the archaeological complex was made known to the outside world"

9. **Select the boxes to show how Passage 1, Passage 2, or both passages present the topic of visitors to Machu Picchu.**

	Passage 1	Passage 2	Both
Visitors will enjoy beautiful scenery while at Machu Picchu.	☐	☐	☐
Machu Picchu needs to be carefully protected from visitors.	☐	☐	☐
Visitors use Machu Picchu as a place for consideration and reflection.	☐	☐	☐

Flavor Is Price of Scarlet Hue of Tomatoes, Study Finds

by Gina Kolata

1 Plant geneticists say they have discovered an answer to a near-universal question: Why are tomatoes usually so tasteless?

2 Yes, they are often picked green and shipped long distances. Often they are refrigerated, which destroys their flavor and texture. But now researchers have discovered a genetic reason that diminishes a tomato's flavor even if the fruit is picked ripe and coddled.

3 The unexpected culprit is a gene mutation that occurred by chance and that was discovered by tomato breeders. It was deliberately bred into almost all tomatoes because it conferred an advantage: It made them a uniform luscious scarlet when ripe.

4 Now, in a paper published in the journal *Science*, researchers report that the very gene that was inactivated by that mutation plays an important role in producing the sugar and aromas that are the essence of a fragrant, flavorful tomato. And these findings provide a road map for plant breeders to make better-tasting, evenly red tomatoes.

5 The discovery "is one piece of the puzzle about why the modern tomato stinks," said Harry Klee, a tomato researcher at the University of Florida in Gainesville who was not involved in the research. "That mutation has been introduced into almost all modern tomatoes. Now we can say that in trying to make the fruit prettier, they reduced some of the important compounds that are linked to flavor."

6 The mutation's effect was a real surprise, said James J. Giovannoni of the United States Department of Agriculture Research Service, an author of the paper. He called the wide adoption of tomatoes that ripen uniformly "a story of unintended consequences."

7 Breeders stumbled upon the variety about 70 years ago and saw commercial potential. Consumers like tomatoes that are red all over, but ripe tomatoes normally had a ring of green, yellow or white at the stem end. Producers of tomatoes used in tomato sauce or ketchup also benefited. Growers harvest this crop all at once, Dr. Giovannoni said, and "with the uniform ripening gene, it is easier to determine when the tomatoes are ripe."

8 Then, about 10 years ago, Ann Powell, a plant biochemist at the University of California, Davis, happened on a puzzle that led to the new discovery.

9 Dr. Powell, a lead author of the *Science* paper, was studying weed genes. Her colleagues had put those genes into tomato plants, which are, she said, the lab rats of the plant world. To Dr. Powell's surprise, tomatoes with the genes turned the dark green of a sweet pepper before they ripened, rather than the insipid pale green of most tomatoes today.

10 "That got me thinking," Dr. Powell said. "Why do fruits bother being green in the first place?" The green is from chloroplasts, self-contained energy factories in plant cells, where photosynthesis takes place. The end result is sugar, which plants use for food. And, Dr. Powell said, the prevailing wisdom said sugar travels from a plant's leaves to its fruit. So chloroplasts in tomato fruit seemed inconsequential.

11 Still, she said, the thought of dark green tomatoes "kind of bugged me." Why weren't the leaves dark green, too?

12 About a year ago, she and her colleagues, including Dr. Giovannoni, decided to investigate. The weed genes, they found, replaced a disabled gene in a tomato's fruit but not in its leaves. With the weed genes, the tomatoes turned dark green.

13 The reason the tomatoes had been light green was that they had the uniform ripening mutation, which set up a sort of chain reaction. The mutation not only made tomatoes turn uniformly green and then red, but

also disabled genes involved in ripening. Among them are genes that allow the fruit to make some of its own sugar instead of getting it only from leaves. Others increase the amount of carotenoids, which give tomatoes a full red color and, it is thought, are involved in flavor.

14 To test their discovery, the researchers used genetic engineering to turn on the disabled genes while leaving the uniform ripening trait alone. The fruit was evenly dark green and then red and had 20 percent more sugar and 20 to 30 percent more carotenoids when ripe.

15 But were the genetically engineered tomatoes more flavorful? Because Department of Agriculture regulations forbid the consumption of experimental produce, no one tasted them.

16 And, Dr. Giovannoni says, do not look for those genetically engineered tomatoes at the grocery store. Producers would not dare to make such a tomato for fear that consumers would reject it.

17 But, Dr. Powell said, there is a way around the issue. Heirloom tomatoes and many wild species do not have the uniform ripening mutation. "The idea is to get the vegetable seed industry interested," Dr. Powell said.

10. PART A

Which idea is introduced in paragraphs 1-3 and developed in the passage?

A. Flavorless tomatoes are best understood as an accident of nature.
B. In the near future, tomatoes will be both delicious and easy to transport over long distances.
C. Scientists have found that there may be a genetic cause for tomatoes' lack of flavor.
D. The interests of tomato growers and consumers have finally come together.

PART B

Which <u>three</u> details from the article support the answer to Part A?

A. The refrigeration of tomatoes during transportation destroys their flavor and texture.
B. A mutation resulted in tomatoes that are beautiful and uniform in shape when they ripen.
C. By trying to make a prettier tomato, breeders have produced a tomato that lacks important flavor compounds.
D. Tomato breeders recognized the mutation about 70 years ago and recognized its commercial potential.
E. Producers of tomato sauce and ketchup have also benefitted from using the modern variety that ripens uniformly.
F. The mutation shuts off genes that allow a tomato to make its own sugar instead of getting it from plant's leaves.
G. Using genetic engineering to activate the disabled gene, researchers produced a fruit with 20 percent more sugar.

11. Read the following statement.

Seventy years ago, breeders engineered a tomato that ripened uniformly.

What are <u>two</u> possible effects of this event?

A. Producers found it easier to determine when to harvest the tomatoes.
B. The new tomato was proven to be more flavorful.
C. The tomatoes turned dark green before they ripened.
D. The ripe tomato lacked any carotenoids.
E. The fruit of the tomato was able to manufacture some of its own sugar.
F. Consumers found the tomatoes more visually appealing.

12. Read the following statement.

Ten years ago, scientists introduced weed genes into tomato plants.

What are <u>two</u> possible effects of this event?

A. Producers found it easier to determine when to harvest the tomatoes.
B. The new tomato was proven to be more flavorful.
C. The tomatoes turned dark green before they ripened.
D. The ripe tomato lacked any carotenoids.
E. The fruit of the tomato was able to manufacture some of its own sugar.
F. Consumers found the tomatoes more visually appealing.

13. PART A

What concept does the author develop in paragraphs 14-16 of the article?

A. The tomatoes containing the weed gene are more flavorful than traditional tomatoes, but they will be rejected by consumers because of their appearance.
B. Because of the controversy surrounding genetically engineered tomatoes, the public will not have the opportunity to taste them.
C. Despite their increased sugar levels, the genetically engineered tomatoes actually lack improved flavor.
D. The vegetable seed industry is lobbying to persuade the Department of Agriculture to permit people to eat experimental produce.

PART B

Which piece of evidence from the article <u>best</u> supports the answer to Part A?

A. "To test their discovery, the researchers used genetic engineering to turn on the disabled genes while leaving the uniform ripening trait alone." (paragraph 14)
B. "The fruit was evenly dark green and then red and had 20 percent more sugar and 20 to 30 percent more carotenoids when ripe." (paragraph 14)
C. "But were the genetically engineered tomatoes more flavorful?" (paragraph 15)
D. "Producers would not dare to make such a tomato for fear that consumers would reject it." (Paragraph 16)

14. PART A

What can the reader infer about the author's attitude toward standard modern tomatoes?

A. She is concerned that the tomatoes are unhealthy.
B. She admire the tomatoes' beautiful color and shape.
C. She is puzzled that scientists would experiment with tomatoes.
D. She is dissatisfied with the tomatoes' bland flavor.

PART B

Which <u>two</u> words from the article <u>best</u> support the answer to Part A?

A. tasteless
B. green
C. luscious
D. fragrant
E. stinks
F. prettier