

HUMANITIES INSTITUTE

LATIN AMERICAN INNOVATIONS

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Overview When the Europeans arrived, they witnessed things they never could have imagined, with technologies and practices that challenged them in every way. The Latin American world had innovations at every turn, beginning with their architecture, and including agriculture, hunting, textiles, ceramics, and their cosmology. Later, innovations came from Latin America largely because of the fusion of European and indigenous cultures. Finally, in the 20th century, Latin American innovations played out on a global scale, where it was possible for individuals throughout the world to appreciate the unique contributions and innovations of Latin Americans in many different walks of life.

ANCIENT PERIOD

Preclassical

Ceramics: Olmecs (1200 – 400 B.C.E.): The Olmecs were noted for their statues that exaggerated the roundedness of the heads and bodies. What was recently discovered in deep tombs were surprisingly subtle ceramics made of a fine white clay, and molded into very realistic hollow figurines of babies, showing rolls of baby fat and chubby little cheeks. No one knows the purpose, but they were unique at that time for their realism and integrity of form.

Ball Courts: Monte Alban (400 – 100 BCE): The ball courts in Monte Alban were more extensive than in any other cultures that came before and after, and at least five large courts have been identified. The Zapotec culture of southern Mexico a special type of rubber that they used for the balls, and the courts were designed so that then the balls hit the wall, they slid down to return into the court.

Textiles and Ceramics: Moche (400 – 100 BCE): In the 1980s and into the early 2000s, new tombs were discovered and archeologists were astounded by the innovations they found. The Moche had created expert-level ceramics that were for practical as well as ceremonial use, many intricately depicting sex acts, and with a glaze that preserved the color and details to an amazing degree. They also found the Moche had new methods of mummifying corpses, and also weaving textiles with elaborate patterns. In addition, the Moche created elaborate gold ornaments and headdresses using a process of hammering that resulted in a surprisingly smooth finish.

Mesoamerican Hallucinogenic Herbal Concoctions: Mesoamerican and South American cultures were often shamanistic, and the use of hallucinogenic herbal substances was a part of religious rituals. The herbs were said to have healing properties: psychological as well as physical, and represented an innovative way to use herbs, not only as medicine, but as a spiritual healing substance.

Classical

Mayan Calendar: The idea of the Mayan calendar is something of a misnomer, since it was not a single calendar, but a series of three separate interpenetrating, corresponding calendars, which was a dramatic improvement over the calendars that had been used before the Maya. The three calendars consisted of the Long Count (solar universal cycles), the Divine Calendar (260 days, tied to religious and ceremonial events), and the Civil Calendar, which is a solar calendar divided into 18 months of 20 days each, with a leap year. The Long Count calendar predicts the end of cycles, and potentially the end of the world. The end of the last Long Count cycle was said to have corresponded to December 21, 2012.

POSTCLASSICAL

Aztec Calendar: Like the Mayan calendar, the Aztec calendar is actually built on separate inter-related calendars. The Xihpohualli (the agricultural year count) has 365 days. The Tonalpohualli (the day count) has 260 days, and was used for religious purposes. The system was based on 13, and each calendar wheel moved in conjunction with each other in intervals of 13. After 20 “trecenas”, and the passage 260 days, the two wheels were back in their

original position. Each Trecena (13-day block) corresponded to a god or elemental force, as the provider of the “shadow soul” life energy for the day.

Inca Calendar and Constellation Stories: The Inca calendar started on December 21, which is the solstice. It was a 365-day solar calendar. They also had a lunar calendar, which was 328 days. However, very little is known about how the Inca used their solar and lunar calendars. More is known from mythology about how they created sky maps. There are a few remaining artifacts that seem to depict a ruler’s relationship to specific constellations. One of them, the Inti Punchaco, has been extensively studied, and it seems to point to the specific constellation that was thought to be the origin of that group.

Aztec Agriculture (1200 – 1519): The Aztecs devised a unique system of aquaculture known as “chinampas,” in which they created anchored floating islands within Lake Chapultepec in the Valle de Mexico. They were very productive, and in them, the Aztecs raised corn, beans, tomatoes, chilis, squash, and other products. At the same time, they were able to raise fish and ducks.

Inca Engineering (1430 – 1530): The Incas were master engineers, and it is a stunning testimony to their inventiveness that they could construct massive earthworks, drainage systems, waterways, and roads without the use of blueprints or drawings (as far as we know), but with quipus (knotted string). The ceremonial buildings at Cuzco have running water and are built on a mountaintop whose sides were reinforced to eliminate the possibility of erosion and flash floods.

Inca Quipus: The quipus were elaborate sets of knotted strings carried by runners along the Inca highway from community to community along the vast federation. They are a series of knots tied in cotton string and they were used for numeric and other values. The quipu could have as many as 2,000 cords. They indicate that the culture was essentially focused on numbers, accounting, trade, construction, and military operations.

EARLY MODERN (COLONIAL) PERIOD

Churrigueresque Architecture: In the Seventeenth Century, construction on large churches and cathedrals was enhanced by the use of new ornamentation, which was an exuberant, extremely ornate Baroque style developed in Spain and known as Churrigueresque. In Mexico, Peru, and Ecuador, the style took an even more dramatic turn, and was modified using different colors, types of shapes, and figures.

Mining Engineering / Tunneling: Mexican engineers developed new ways to mine gold and silver, and developed interconnecting tunnels with innovative ways to provide fresh air, and also to monitor air quality. While the work in the mines continued to be difficult and dangerous, the methods developed by the Mexican mining engineers in 18th century Guanajuato contributed to safety.

Dance: Innovative dance forms emerged during the Colonial era, as Spanish music and dance blended with indigenous and African beliefs. For example, the Cueca (Chile) and the Zamacueca (Peru), are a blending of criollo and Spanish fandango.

Amalgamation: Amalgamation was perfected in Mexican and South American gold mines. In this process, gold ore was placed over mercury-coated copper plates and tables, which resulted in dissolution of the gold into the mercury. Large quantities of water were required in the process, with the unfortunate consequence of contamination of rivers, streams, and aquifer.

Textiles: Handloomed cloth, woven from wool, cotton, llama, or alpaca blended European technologies with preHispanic designs and colors. Examples of innovative clothing include the Quechquemilt, a Mexican light poncho used by women to cover the neck and shoulders; the serape, a brightly woven blanket worn by men; the huipil, a brightly woven, patterned blouse worn by women in southern Mexico and Guatemala; the polleras (skirts) worn by the “cholas” market women in Bolivia, over layers of petticoats; the rebozos (shawls) worn by women to stay warm and to carry babies.

Lace and Embroidery: Lacework was innovated in Brazil and also in Paraguay, where indigenous materials and patterns were used, thanks to the isolationist policies of President Lopez Solano. In addition, embroidery was

developed and widely used, in Mexico, Guatemala, and in Brazil, each developing their unique forms. In Brazil, a unique kind of “padded embroidery” was developed and later exported to Europe.

19TH CENTURY

Music and Dance: Many dances and songs which were previously suppressed under Spanish rule as being subversive became lively and energetic celebrations of cultural heritage and national identity. For example, the Jarabe Tapatío (Mexican hat dance), is a folkloric dance that includes elements of courtship and the music is performed by mariachis. It was banned because it was considered challenging to the Spanish rule, but after independence quickly became a symbol of nationalistic pride, not only for the dance and the music, but also for the dance costumes themselves, which include the “china poblana” (brightly embroidered and beribboned skirts and blouses), and the “charro” men’s outfit with silver button-lined pant legs and bedecked sombrero.

Innovative forms of government (isolationist military dictatorship): The isolationist military dictatorships that emerged in some countries while there was still some euphoria of independence from Spain were innovative in their willingness to completely wall off their country in the attempt to be self-sufficient. The result was both hyper-nationalism and corruption, as smuggling and trafficking of contraband were secretly sanctioned by the dictator. The dictatorship preserved national identity, but in the end, was pernicious in that it allowed the country to be led into disastrous wars.

Rubber: During the 19th century, innovations in the collecting and harvesting of latex from the rubber tree led to a tremendous boom in the Amazon rain forest in Brazil, Ecuador, Colombia and also parts of Peru, such as Iquitos. The process allowed clothing to be waterproofed, and later for tires to be developed. The “Rubber Barons” developed highly labor-intensive rubber plantations and forced Indians to tap the latex from the trees. New, more productive hybrids of rubber trees were created, leading to even more production. The innovations were eventually the undoing of the Brazilian rubber industry, because they were adopted in Southeast Asia, where they thrived, creating competition.

Indicator Minerals / “Pathfinders”: Geochemists found that, using new technologies, there were “indicator minerals” or “pathfinders” that could be used in the exploration of gold and silver. These minerals were typically ones with zinc, cobalt, arsenic, or mercury and they led to new discoveries in areas that had been given up as depleted in Bolivia, Mexico, and Peru.

Mining Processes: The Chilean mining industry was a world leader in developing the ability to mill rock into very fine particles that could then be used in new chemical processes, such as the cyanide process, which allowed fine-particle gold to be extracted.

20TH CENTURY

Ecotourism: Because of the many miles of seacoast, the unique tropical rain forest ecosystems, dramatic mountains, Latin American countries have been in the forefront of developing innovative tourism, including ecotourism and cultural tourism. Costa Rica was one of the first countries to basically convert the entire country into an ecotouristic center, which meant that real estate and recreation development had to be strict, transparent, and uniformly enforced. Other countries that have made eco-tourism an emphasis include Brazil, Belize, Guatemala, Mexico, and Argentina. Argentina’s Patagonia region attracts tourists due to its proximity to the South Pole. Mexico has developed a protected regions that are supported by the government. Many are offshore, but others are in delicate ecosystems such as hot springs and waterfalls. The ecotourism is usually coupled with efforts to protect specific species, such as the endangered sea turtle, and with scientific research.

Medicinal plants and herbs: Many experiments have been conducted with fruit, plants and herbs of the Amazon rain forest and in subtropical rain forests of Latin America. Some of the results of the experiments have become household names and widely adopted products, including lapacho bark, stevia (used as sweetener and in anti-diabetes), yerba buena, yerba mate, and more.

Magical realism: One of the innovations of the Latin American literary world in the 20th century was the development of the genre, magical realism. It is a philosophically based approach to narrative which juxtaposes a

detailed, realistic setting and characters with the supernatural. If there are antecedents in literature, perhaps the most obvious one would be Shakespeare's *The Tempest* and the introduction of Prospero's books and Caliban. Alejo Carpentier, coined the term, "lo real maravilloso" which aligned itself with surrealism. But magical realism is much deeper than that, and often the juxtapositions of realism and magic give rise to critiques of the status quo, namely fascist dictatorships (which is why so many purveyors of magical realism ended up in exile).

Mexican handcrafted toys: Traditional Mexican hand-crafted toys are unique in the world because their inspiration dates back to the civilizations before the arrival of the Europeans. Mexican hand-crafted toys enjoyed a global revival in the 20th century as they were publicized in art exhibits (Museo de Arte Popular) and in magazines. The most popular and influential hand-crafted toys include the cup and ball, felt and yarn dolls and animals, miniature clay dishes, and miniature dioramas that include people, animals, Nativity scenes, and features of the countryside, such as fruit stands, open air markets, and more. The traditional toys became so popular in the 20th century that they were often exported for use as home decorations as well as for their intended use as toys.

Mexican Handcrafted fireworks: The Mexican Independence Day, patron saint days and religious festivals are almost always accompanied by evening spectacles of dance and then fireworks. The fireworks are not the type you'll see in China or in the United States, but are unique to Latin America. They are hand-crafted, and in Mexico, and the fireworks fit within different shapes of frames. The most common are the "torito" (bull), the "Castillo" (castle), and other shapes. The fireworks are mounted on the frames and then set off by hand. Needless to say, this is dangerous.

Lithium Mining: Lithium is produced from the salt brine in ancient lake beds. There is lithium in the salt lakes and flats of Nevada and Utah, but the largest reserves are in Bolivia, in the Salar de Uyuni, located in the southern part of Bolivia, in the Andes. To process the lithium it is necessary to extract the water trapped in gravel in the old lake bed, and Bolivian chemists developed a new way of concentrating the lithium from the brine. The implications for the lithium battery industry are staggering.

Discussion/Questions

1. Both the Moche and the Olmecs created ceramics from very fine clay, which they could mold into innovative and realistic sculptures. The Olmecs were known for their ceramic babies, chubby and realistic, which might have suggested the embodiment of new beginnings, and have been used in conjunction with agriculture (the sprouting corn, for example). The Moches were known for very unique designs and shapes, including those depicting sex acts. What do you think might have been the purpose or function of the Moche ceramics. How might they have differed from the Olmecs?
2. The calendars of both the Maya and the Aztecs were very complex, and they did not consist of a single calendar, but of two or three interpenetrating ones. They simultaneously marked solar time, religious festival time, and government / civil activities. Further, they were broken down into blocks of time, and each block of time (for example, 13 days) corresponded to a god or a vital life force. Describe how the information from the calendars figured into daily life.
3. The ongoing influence of the European invaders resulted in a tremendous fusion of cultures. Many of the activities of daily life were deeply affected, such as dress, customs, dance, and music. Describe some of the innovations of Colonial times that reflected a fusion of cultures.
4. The nineteenth and twentieth centuries were times of great political change as well as industrial transformation. Some of the ways in which Latin American innovations impacted the world had to do with improvements in industrial processes in mining. Later, new forms of political activism having to do with ecological activists helped spur on ecotourism. Describe the way in which Latin American natural resources have formed the foundation of innovation.

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