The Ancients: Artifacts and Aircraft

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Abstract

Throughout literature and other art forms, certain themes appear repeatedly. The same might be said for engineering designs, specifically the design of aerospace vehicles. In 1996, Lumir Janku wrote about a set of artifacts, discovered in Peru and determined to be Pre-Columbian, that can be interpreted as models of delta-winged fliers. The design of the Peruvian artifacts has been interpreted in multiple ways by a variety of professionals. The delta wing was also incorporated into the design of civilian aircraft during the 20th Century. Modern delta-winged aircraft were used successfully in both military and civilian applications for more than 40 years. It is interesting to read about the possibility that this aeronautical design may have originated millennia earlier with a culture that did not leave written records to explain its artifacts crafted in gold.

Keywords: aviation history, delta wing, Pre-Columbian artifacts

Throughout literature and other art forms, certain themes appear repeatedly. The same might be said for engineering designs, specifically the design of aerospace vehicles. Man's fascination with how birds fly can be linked to the ancient legends of Daedalus or the winged Egyptian gods, and then more recently to John Damien's attempt to fly with wings made from chicken feathers (Brady, 2000) or Otto Lillienthal's essays linking the physiology of birds to the design of early gliders (Lillienthal, 2001). In 1996, LumirJanku wrote about a set of artifacts, discovered in Peru and determined to be Pre-Columbian, that can be interpreted as models of delta-winged fliers.

1. Pre-Columbian Artifacts

The design of the Peruvian artifacts has been interpreted in multiple ways by a variety of professionals. Archeologists originally categorized the objects as zoomorphic or objects designed by ancient natives to depict winged animals (Janku, 1996). However, in more recent years aviation enthusiasts have taken a different approach. In 1997, Algund Eenboom examined other Incan artifacts resembling insects and determined that these artifacts correctly depict insect wings attached to the top of the insects' bodies (Coppens, 1997). By comparison, the wings on the Peruvian artifacts are attached to the bottom of what one might refer to as the fuselage. Additionally, the wings appear rigid and form a delta pattern, unlike animal wings that have been studied by a number of aviation designers.

2. 20th Century Applications

This delta pattern was repeated in aircraft design by Alexander Lippisch. Lippisch's early experimentation with the delta wing design was for use with gliders. His DM-1 was a prototype for further work with gliders of this design, and some say would have led to development of a ramjet fighter by the Germans in the 1940s (Boyne, 2012). Testing of the DM-1 in the United States after World War II led to focused effort by Convair design engineers to create similarly configured aircraft.

Convair engineers' interest was piqued by Lippisch's design. They replicated it for the XF-92, a tailless delta wing aircraft which served as a precursor to delta-winged aircraft of the mid- to late-1900s (Boyne, 2012; Johnson, 2005). Convair won a contract with the U.S. Air Force in the early 1950s to construct the airframe for its advanced development objective weapons system.

The first iteration of this contract was the F-102, but production was slowed by failure of the aircraft to achieve Mach speed or the expected operational ceiling due to transonic drag discovered during wind tunnel testing (Johnson, 2005). Redesign of the wing to a 60-degree planform that was much thinner than Lippisch's delta gliders' wings (Hallion, 2011), combined with replacement of other components of the weapon system led to renaming the aircraft by the U.S. Air Force. It became the F-106 Delta Dart, an interceptor jet fighter. This aircraft was considered one of the U.S. Air Force's most competent fighters and pilots were afforded above-average air-to-air maneuverability (Johnson, 2005). The F-106 was officially retired in the late 1980s, having been replaced by the McDonnell-Douglas F-15 which is currently in service as part the U.S. Air Force fleet.

The delta wing was also incorporated into the design of civilian aircraft during the 20th Century. Test flights of the Concorde, a joint British-French supersonic passenger aircraft, took place in Europe in 1971. The European team focused on supersonic transport in an effort to carve a niche in the civil aviation market which by the 1970s was dominated by U.S. manufacturers (Adams, 2011). Concorde was viewed as an elegant and extraordinary example of technology (Adams, 2011). It was capable of flying from London to New York in half the standard flying time. However, environmental concerns about sonic booms and a catastrophic accident that killed 113 people in 2000 eventually led to the retirement of the Concorde fleet in 2003 (Adams, 2011).

3. Conclusion

Modern delta-winged aircraft were used successfully in both military and civilian applications for more than 40 years. It is interesting to read about the possibility that this aeronautical design may have originated millennia earlier with a culture that did not leave written records to explain its artifacts crafted in gold. Perhaps the small figures are models of fish or birds or insects that have long since gone extinct; perhaps they are flights of fancy or toys designed by an artisan skilled at amusing young children; or perhaps they are models of aircraft that someone actually saw in the ancient sky.

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