

Book of Mormon Anachronisms Part 4: Metals and Metallurgy

Among the critics' list of supposed Book of Mormon anachronisms are various metals and metallurgy (the process of altering ores into useful metals). These metals include *brass*, *iron*, and *steel*. This paper also discusses writings on metal plates and the possible composition of the Book of Mormon plates.

Metallurgy

For years the best evidence suggested that metallurgy was unknown in the Americas until about 900 A.D. Recent studies have altered this view. "Current information," writes one non-LDS scholar, "clearly indicates that by 1000 B.C. the most advanced metallurgy was being practiced in the Cauca Valley of Colombia."¹ Peruvians began metallurgy as early as 2000 B.C. and since it is generally accepted that Peru and Mesoamerica were in contact by trading, it seems reasonable that this knowledge was passed on to Mesoamerican peoples, especially since at least a dozen pieces of metal have been found in Mesoamerica dating to before 900 AD.²

The problem with ancient metal artifacts is that metal (left untreated or exposed to the elements) corrodes and deteriorates—especially in the humid and wet jungles of Mesoamerica. Language studies, however, help confirm that metallurgy was known anciently in the Americas. Non-Mormon scholars who have reconstructed parts of several ancient Mesoamerican languages were puzzled to find a word for "metal" existed as early as 1000 B.C. while the early language of the Olmecs had a word for metal as early as 1500 B.C.³

Brass

Modern brass—an alloy of copper and zinc—is believed to have been invented in the sixteenth century. The Bible, however, uses the word "brass." Biblical scholars generally explain that "brass" in the Bible actually refers to bronze.⁴ Other recent findings indicate actual "brass" (containing zinc) was used by the Etruscans as early as Lehi's day, suggesting that the *brass plates* may have actually been made of brass.⁵

Iron

While critics have assured us that the Book of Mormon's use of iron is anachronistic, recent research refutes this claim. A pottery vessel dating to around 300 A.D., for example, might have been used for smelting. A metallic mass within this vessel contained copper and iron. The archaeologist who made this find has also found a refined piece of iron in an ancient American tomb.⁶ Even one Book of Mormon critic (who questions the relationship between New World iron and Book of Mormon iron) acknowledges that the Olmecs of Central America (which correspond to logical Jaredite times/places) knew of and used "iron" as evidenced by *iron mirrors*.⁷

In 1996, a non-LDS Olmec specialist, Dr. Anne Cyphers, noted that several tons of iron have been excavated from those sites.⁸ Dr. William Hamblin, in a discussion with John Clark (of the BYU archaeology department) asserts that "a total of 10 tons of iron has been found at San Lorenzo, in several massive hordes, the largest of which was 4 tons. Before the discovery of these hordes, only a few pieces of iron were known. They were discovered by using metal detectors."⁹ Olmecs mining iron sounds remarkably like the Jaredites: "and they did dig it out of the earth; wherefore they did cast up mighty heaps of earth to get ... iron." (Ether 10:23.)

Steel

The King James Bible often uses the word "steel" to refer to what we know today as bronze. Even experts have acknowledged a problem in terminology when discussing "steel" in antiquity. One early native chronicler, for example, wrote that the Tarascans (Mesoamerica's most noted metallurgists at the time of the Spanish conquest) wore "steel" helmets.¹⁰ A type of "steel"—meteoric nickel-iron alloy—was available in Mesoamerica and some non-LDS scholars list the alloy as "steel."¹¹

The "Golden" Plates

According to Joseph Smith, the Book of Mormon was engraved on a stack of plates six inches wide, six inches thick, and eight inches long that had the "appearance of gold."¹² Many critics claim that gold plates of that dimension would weigh about 200 pounds—too heavy for Joseph to carry while running from his enemies.¹³ Those who handled the Book of Mormon, however, claim that the plates only weighed around 50 to 60 pounds.¹⁴

While a solid block of gold might weigh 200 pounds, unevenly hammered sheets of gold within the volume described by Joseph might only weigh 100 pounds. This is still much heavier than several Book of Mormon witnesses claimed. Turning to the New World we find that the ancient inhabitants did indeed make engravings upon a metal which was lighter than gold but had the "appearance of gold."

A 1984 article in *Scientific America* addressed the recent discovery of several large metal objects in South America. Most of these objects were made out of hammered sheet copper. When these copper sheets were first unearthed they were covered with a green corrosion. Once the corrosion was removed, however, they discovered that the copper had originally been covered with a thin layer of silver or gold so that these sheets "appeared to be made entirely out of those precious metals."¹⁵

The most important alloy discovered at these sites was a mixture of copper and gold known as "tumbaga." This alloy has been discovered in ancient Mesoamerican sites at well.¹⁶ When copper and gold (the only two colored metals known

to man) are melted together they mix, and stay mixed after they cool and solidify. Tumbaga ranged from 97% gold to 97% copper with traces of up to 18% of other metals or impurities. Once the gold finish was applied it would appear that the tumbaga object was made of solid gold. While tumbaga “can be cast, drawn, hammered, gilded, soldered, welded, plated, hardened, annealed, polished, engraved, embossed, and inlaid” it would destroy itself if not stored properly.¹⁷ It is therefore interesting to note that the Book of Mormon plates were laid atop two stones that lay across the bottom of the stone box so that the plates would not be exposed to water or dirt.

Too little gold in the Book of Mormon plates would have made them brittle, and too much gold would have made them too heavy as well as increasing the danger of distortion during engraving. If the Book of Mormon plates were made of tumbaga, they were probably between 8 and 12 carat gold and thus would have weighed between 53 and 86 pounds.¹⁸ When tumbaga (which is red) is treated with any simple acid—such as citric acid—the copper in the alloy is removed from its surface leaving a brilliant .0006 inch twenty-three karat gilt coating which is easier to engrave (this process was used in ancient America). To the eye, the object would have the appearance of pure gold.¹⁹

Writings on Metal Plates

While it is possible that some frontiersmen in Joseph Smith’s day believed that ancient people wrote on metal plates, the claim that the Book of Mormon was written on metal plates drew ridicule not many years after Joseph made his claim. As early as 1838 we find outrage at the claim that “Jews” would have kept records on brass plates. “How could brass be written on?”²⁰ By at least 1887 (and for at least a century thereafter) the critics claimed that “no such records were ever engraved upon golden plates, or any other plates, in the early ages.”²¹

Today we have hundreds of examples of ancient writings on metal plates. The oldest example of Hebrew writing on metal is a small engraved gold plate dating to approximately 1000 B.C.²² Ancient metal engraved plates have been found in gold, silver, and bronze (“brass” in the Book of Mormon). One bronze plate in particular has been dated to the sixth century B.C.—the same period the Book of Mormon states that Lehi took the plates of Laban.²³

Some ancient Old World metal plates have been buried in stone boxes²⁴ and some early American traditions include tales of records being kept on metal plates and of ancestors who kept hieroglyphic records on thin gold plates.²⁵

For more details on this topic see
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¹ *Archaeology*, Nov./Dec., 1985, 81.

² John L. Sorenson, “Digging into the Book of Mormon: Our Changing Understanding of Ancient America and Its Scripture,” *Ensign* (September 1984), 34-35.

³ John L. Sorenson, *An Ancient American Setting for the Book of Mormon* (Salt Lake City: Deseret Book Company and FARMS, 1985), 279.

⁴ *Ibid.*, 283.

⁵ *Ibid.*, 283-284.

⁶ *Ibid.*, 284-285.

⁷ Deanne G. Matheny, “Does the Shoe Fit? A Critique of the Limited Tehuantepec Geography,” *New Approaches to the Book of Mormon: Explorations in Critical Methodology*, edited by Brent Lee Metcalfe (Salt Lake City: Signature, 1993), 289.

⁸ William J. Hamblin, “Talk on the Olmecs by Cypher,” posted 9/26/96 SAMU-L. Copy in my possession.

⁹ William J. Hamblin, “Supplement on Cyphers’ talk,” posted 10/2/96 SAMU-L. Copy in my possession.

¹⁰ Sorenson, *An Ancient American Setting*, 283.

¹¹ John L. Sorenson, “A New Evaluation of the Smithsonian Institution ‘Statement Regarding the Book of Mormon,’” (Provo, Utah: FARMS, 1993), 17-18.

¹² Joseph Smith, *Times and Seasons*, v3:9, March 1, 1842, 707.

¹³ See Lucy Mack Smith, *History of Joseph Smith* (Salt Lake City: Bookcraft, 1901), 107-108.

¹⁴ Robert F. Smith, “The ‘Golden’ Plates,” *Reexploring the Book of Mormon*, edited by John W. Welch (Salt Lake City: Deseret Book Company and FARMS, 1992), 276.

¹⁵ Heather Lechtman, “Pre-Columbian Surface Metallurgy,” *Scientific America* (June 1984), 56.

¹⁶ *Ibid.*, 60.

¹⁷ Read H. Putnam, “Were the Golden Plates made of Tumbaga?” *Improvement Era* (September 1966), 789, 828-829.

¹⁸ *Ibid.*, 830-831.

¹⁹ Smith, 276.

²⁰ LaRoy Sunderland, *Mormonism Exposed and Refuted* (New York: Piercy & Reed Printers, 1838), 44-46.

²¹ Rev. M.T. Lamb, *The Golden Bible, or, The Book Of Mormon Is It From God?* (New York: Ward & Drummond, 1887), 11.

²² William J. Hamblin, “Sacred Writings on Bronze Plates in the Ancient Mediterranean,” (Provo, Utah: FARMS, 1994), 4.

²³ Diane E. Wirth, *A Challenge to the Critics* (Bountiful, Utah, Horizon Publishers, 1986), 41-42.

²⁴ H. Curtis Wright, “Ancient Burials Of Metal Documents In Stone Boxes,” *Journal of Library History*, v16:1 (Winter 1981) reprinted in *FARMS*, WRI-81, 48-49.

²⁵ Sorenson, *An Ancient American Setting*, 283; Wirth, 43.

