1-31-2001

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Journal of Book of Mormon Studies

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Of What Material Were the Plates?

Contrary to what some may assume, the plates were most likely made not of pure gold but rather of an alloy termed *tumbaga* by the Spanish.
with a black, hard stain, so as to make the letters more legible and easier to be read.”

—Orson Pratt

The following statements, though based on transcriptions of the characters engraved on the plates and not on examination or intimate knowledge of the plates themselves, are also of interest.

“It [Joseph’s transcription of characters from the plates] consisted of all kinds of singular characters disposed in columns, . . . Greek and Hebrew letters, crosses and flourishes; Roman letters inverted or placed sideways were arranged and placed in perpendicular columns, and the whole ended in a rude delineation of a circle, divided into various compartments, arched with various strange marks, and evidently copied after the Mexican calendar.”

—Charles Anthon

“The characters were arranged in columns, like the Chinese mode of writing, . . . Greek, Hebrew and all sorts of letters, more or less distorted, . . . were intermingled with sundry delineations of half moons, stars, and other natural objects, and the whole ended in a rude representation of the Mexican zodiac.”

—Charles Anthon

“[Martin Harris] was in the habit of exhibiting to his hearers what he claimed to be a fac simile [sic] copy of the title page of the forthcoming book [Book of Mormon].” One who saw this copy said, “On it were drawn rudely and bunglingly, concentric circles, between, above and below, which were characters, with little resemblance to letters.”

—Charles W. Brown

OF WHAT MATERIAL WERE THE PLATES?

Were the Book of Mormon plates pure gold, or were they made from an alloy that looked like gold? The most serious investigation of this question was done 45 years ago by Read H. Putnam of Evanston, Wyoming, a blacksmith and metallurgist. Working first from the general dimensions of the set of plates as reported by eyewitnesses, he calculated that a block of pure gold of that size would have weighed a little over 200 pounds. A number of witnesses, however, put the weight of the set at about 60 pounds. The discrepancy can be partly accounted for by the fact that the leaves must have been handcrafted, presumably by hammering, and irregularities in flatness would have left air space between the plates. This led Putnam to surmise that the entire set of plates would have weighed probably less than 50 percent of the weight of a solid block of the metal.

Because the weight of a metal depends on its purity, we must also consider whether the plates were of pure gold. The Nephites were aware of purity distinctions and alloys. We know, for example, that the “brass” plates were of an alloy (quite surely bronze, a copper-tin mixture) and that the plates of Ether were specifically distinguished as being of “pure” gold (Mosiah 8:9). Furthermore, Nephite taught his associates “to work in all manner of metals and precious ores” (2 Nephi 5:15). Yet nowhere does the text say that the Nephites’ plates were of pure gold.

Joseph Smith’s brother William specifically said that the material of the plates was “a mixture of gold and copper.” (Someone must have provided an objective basis for that statement, for the natural assumption would have been that the plates were pure gold.) The cautious statements by other witnesses, including Joseph Smith himself, who spoke of the plates as having “the appearance of gold,” suggest that the metal may have been an alloy.

Putnam observed that the only two colored metals from antiquity were gold and copper. An alloy of those two elements was called “tumbaga” by the Spaniards and was in common use in ancient tropical America for manufacturing precious objects. Putnam put forward the reasonable hypothesis that metal plates made in Mormon’s day were of that material (the earliest Mesoamerican archaeological specimen of tumbaga—made from a hammered metal sheet—dates to the same century, the fifth century a.d., when Moroni hid up the plates he had in his possession). If Mormon’s Book of Mormon plates were made of tumbaga, their weight would have been much less than had they been made of pure gold. Putnam made that point in mathematical detail and concluded that the total weight of the plates in Joseph Smith’s charge would have been near the 60-pound figure reported by several witnesses.

It is of interest that tumbaga was commonly gilded by applying citric acid to the surface. The resulting chemical reaction eliminated copper atoms from the outer .0006 inch of the surface, leaving a microscopic layer of 23-carat gold that made the object look like it was wholly gold. Plates having “the appearance of gold,” then, are exactly what we would expect if they were made of tumbaga.

In the process of depletion gilding, the particles of gold and copper that are uniformly distributed throughout the alloy are exposed to an open flame, which causes the copper to turn black. The copper is then removed by a mildly acidic “pickle,” such as a citrus extract. When heated and polished, the remaining surface particles compress and form a thin layer of pure gold.
“What Meaneth the Words That Are Written?” Abinadi Interprets Isaiah

Ann Madsen

2. The brass plates version of Isaiah prophesies that the prophet Abinadi uses so effectively in those wonderful verses of Isaiah 1:19–20, comes the good news. This is revelation. It’s the welcome messenger from the other world, the angel who brings us the gospel—who brings us the message of salvation, who brings us the peace, which you don’t find on this side of the mountain.” ("The Mountain of the Lord’s House,” lecture 16 of Ancient Documents and the Pearl of Great Price [series of videotaped lectures from a 1986 honors class at Brigham Young University on the Pearl of Great Price], transcript p. 8–9.)
4. In Alma 32, Alma expounds the method whereby this change can occur.

How Witnesses Described the “Gold Plates”

Kirk B. Henrichsen

The descriptive material for this article was compiled by Kirk Henrichsen, of the staff of the Museum of Church History and Art in Salt Lake City, who kindly offered it for use in the Journal.

1. Joseph Smith Jr., “Church History,” Times and Seasons, 1 March 1842 (also known as the Wentworth Letter), “The Testimony of Eight Witnesses,” Book of Mormon; and Orson Pratt, in a pamphlet titled An Interesting Account, offers Several Remarkable Observations, and of the Late Discovery of Ancient American Records (Edinburgh, Scotland: The Ballantyne and Hughes, May 1840), 12–13. The Wentworth Letter, the Prohet Joseph Smith’s sketch of the history and faith of the Latter-day Saints written for the editor of the Christian Democrat, utilizes much of the same material found in Pratt’s pamphlet. Although Pratt did not see or handle the plates, he learned much about them through his close association with Joseph Smith.

2. Now he was speaking! He may have turned to read at that moment from a scroll, a plates, or book of some kind containing Enuoa. The brass plates contained this material.
4. From this point on in the dialogue, I quote rather than paraphrase Abinadi’s powerful words.


7. Hugh Nibley offers an additional view: “Who would help come from the mountains? That is explained very well in those wonderful verses of Isaiah which the prophet Abinadi uses so effectively, Isaiah 52:7.... How beautiful upon the mountainside are the feet of him who brings good tidings”—literally, are the legs of the runner who brings good news and who causes us to hear that there is peace. Abinadi is announcing that from the other side of the mountain, from the other world, comes the good news. This is revelation. It’s the welcome messenger from the other world, the angel who brings us the message of salvation, who brings us the message of peace, which you don’t find on this side of the mountain.” ("The Mountain of the Lord’s House,” lecture 16 of Ancient Documents and the Pearl of Great Price [series of videotaped lectures from a 1986 honors class at Brigham Young University on the Pearl of Great Price], transcript pp. 8–9.)
15. In Alma 32, Alma expounds the method whereby this change can occur.

7. It is also possible that other metallurgical treatments such as a hammered copper-silver-gold alloy could have fur-

ENDNOTES

2. See John L. Sorenson, An Ancient American Setting for the Book of Mormon (Salt Lake City: Deseret Book and FARMS, 1985), 283–84; and his “Metals and Metalurgy Relating to the Book of Mormon Text” (FARMS, 1992).

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nished a product similar in appearance (see Letchman, “Pre-Columbian Sur-
face Metallography”). That would have been the work of Howard Gay and Grey Streeter-Pena, “The Isahact Region: A Second Locus for the Pro-
duction of Bronze Alloys in Ancient Mesoamerica,” Science 257, 28 August
1992, 1215). Moreover, Nephi’s original plates might have been of different
composition than Mormon’s plates.

The Book of Mormon Plates
Janne M. Sjodahl

Like the article itself, the following notes are as they appeared in the original
article from the April 1925 Improvement Era, with the exception that publication
data has been added in brackets. 1. This is quoted from (Gregg Thomas.),
The Prophet of Palmyra (New York: J. B. Alden, 1890) and may or may not be
true. 2. An excellent little book by George Reynolds [Salt Lake City: Juvenile
Instructor Office, 1883].

1. Robert Deutsch, Epigraphic Considerations on Janne

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Sjodahl’s Experiment with Nephiite Writing

1. G. de Jonge, The Book of Mormon Art of Arnold Friberg, The
Painter of Scripture

4. See History of the Prophet Joseph, by his mother, Lucy Smith, pp. 85 and 105. The
account related must have been given by the Prophet himself to his mother. [The pages cited correspond to
the 1962 edition of this book, revised by George A. Smith and Ellis Smith and published by the Improvement Era.]}


The Book of Mormon Art of Arnold Friberg, The
Painter of Scripture

Vern Swanson

Art 11 (December 1981): 75.
3. Arnold Friberg notes (February 2001), SMA Library.
6. Ibid.

The Vision of a Modern Master (Flagstaff, Ariz.: Northland, 1985), 34. Schwarz has a background in general historical
studio photography and magazine and book illustration.

3. The American edition, published at Nauvoo, 1842, has 566 pages, 5½ by 3½
inches, including the margins.

10. Some consider 2 Nephi 27 to be partly
8. Jesus also taught more in Jerusalem
than is recorded in the New Testament. As John wrote, he declared, “And there are also many other things which Jesus did, the which, if they should be written every one, I suppose that even the world itself could not contain the books that should be writ-
ten.” (John 21:25).

11. See Sidney B. Sperry, Doctrine and
Covenants Compendium (Salt Lake City: Bookcraft, 1980), 7. Nephi states that the fulfillment of the gospel was found in the Book of Mormon, see 1 Nephi
27:13–21.

12. Quoted in Grady Johnson, “Moses and
the Synopses of the Bible,” BYU Journal of Dis-
Seated (Salt Lake City: Deseret Book, 1976),
28:17. The subheadings of the Book of
Mormon books were part of the text writ-
ten by Mormon and translated by
Joseph Smith, while the synopses of chapters were written by various modern-day apostles as new editions were printed. For examples of the sub-
headings written by Mormon, see the major subheading under the titles of Alma, Helaman, 3 Nephi, and 4 Nephi; and for examples of subheadings within various books, see the italicized comments preceding Mosiah 8, 23; Alma 5, 9, 17, 21, 36, 38, 39, 43; Helaman 7, 13, and 3 Nephi 11.

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Smith—History 1:34). The Doctrine and
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42; 45:28, 66:2). For a definition of the fulness of the gospel given within the Book of Mormon, see 1 Nephi
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