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Abstract The question of where Joseph Smith received the text of the Book of Abraham has elicited three main theories, one of which, held by a minority of church members, is that Joseph translated it from papyri that we no longer have. It is conjectured that if this were the case, then the contents of the Book of Abraham must have been on what nineteenth-century witnesses described as the “long roll.” Two sets of scholars developed mathematical formulas to discover, from the remains of what they believe to be the long roll, what the length of the long roll would have been. However, when these formulas are applied on scrolls of known length, they produce erratic or inconclusive results, thus casting doubt on their ability to accurately conclude how long the long roll would have been.



Joseph Smith Papyrus I. © Intellectual Reserve, Inc.

FORMULAS AND FAITH

JOHN GEE

While one might like a simple or simplistic argument about the historicity of the Book of Abraham, such arguments tend to be complex. Sometimes they become so complex that individual discussants lose the thread of the argument and consequently end up undermining their larger argument to attack a certain smaller argument. This paper will discuss one such argument. But first, it is necessary to set the argument in context.

One of the more prominent issues with the Book of Abraham is the relationship of the Book of Abraham to the Joseph Smith Papyri.¹ There are three basic positions here:

1. The text of the Book of Abraham was translated from papyri that we currently have. (Or, from the unbelieving perspective, Joseph Smith thought that the text of the Book of Abraham was on papyri that we currently have.)
2. The text of the Book of Abraham was translated from (or Joseph Smith thought the text of the Book of Abraham was on) papyri that we do not currently have.
3. The text of the Book of Abraham was received by revelation independent of the papyri.

Of these three positions, the first seems to be a minority viewpoint espoused by few if any members of the Church of Jesus Christ of Latter-day Saints. Of the remaining two options, the last is preferred

FROM THE EDITOR:

One of the questions that swirls around the Book of Abraham is the role that the papyrus scrolls played in the translation process. A corollary to that question is, was one or more of the scrolls long enough to contain the Book of Abraham as we now have it? The extant fragments certainly are not long enough to have contained the current text. But, how long were the scrolls originally? John Gee has tackled this relative question with objectivity and precision.

by a majority of the members of the church who care about this issue. Most members find the issue unimportant.² Such readers might be forgiven for deeming this a trivial matter. Yet some are interested in which of the foregoing theories best fits the available evidence.

Joseph Smith once had possession of at least five papyrus documents:³

- A scroll belonging to Horos, son of Osoroeris, that contained, at a minimum, a text now called the Document of Breathings Made by Isis.
- A scroll belonging to Semminis, daughter of Eschons, containing, at a minimum, a text now called the Book of the Dead.
- A scroll belonging to Neferirtnoub, containing, at a minimum, a vignette from the Book of the Dead.
- A scroll belonging to Amenothis, son of Tanoub,⁴ containing, at a minimum, portions of the Book of the Dead together with other texts.
- A hypocephalus belonging to Sesonchis.

Nineteenth-century eyewitnesses, however, did not have training in Egyptology and did not provide descriptions of the papyri that accord with modern Egyptological notions.⁵ Instead they recalled

- a. some papyri “preserved under glass,”⁶ described as “a number of glazed slides, like picture frames, containing sheets of papyrus, with Egyptian inscriptions and hieroglyphics”;⁷
- b. “a long roll of manuscript”;⁸
- c. “another roll”;⁹ and
- d. “two or three other small pieces of papyrus with astronomical calculations, epitaphs, &c.”¹⁰

If one follows position 1 or 2, one might like to know which papyrus contained the Book of Abraham. (If one follows position 3, which is the majority position, then the point is moot since the answer is none of the papyri.) If one looks to nineteenth-century eyewitnesses for information about which of these types of papyri might have contained the Book of Abraham, one finds that these accounts—including those both friendly and hostile to Joseph Smith—are consistent in identifying the “long roll” (b) as the source of the Book of Abraham.¹¹ Adherents of the minority theories (1 and 2) have some-

times sought to identify which of the papyri was the long roll.

Unfortunately, of the five papyrus documents that Joseph Smith had, only fragments of the first three have survived. The fragments of the scroll of Semminis are the most extensive, and comparison with Books of the Dead from the same time period indicates it could have originally been about seven meters (roughly twenty-three feet) long. But we know that not all the papyri were intact by the time they reached Joseph Smith (as in example d), and we do not know if the papyrus fragments were part of one of the scrolls at all. Indeed, it seems that only the fragments that were mounted and preserved (as in example a) were passed back to the church in 1967. This alone would seem to rule out position 1, since it requires that the Book of Abraham be on the mounted fragments, although the eyewitnesses say it was on the “long roll” (b). How long, then, was that long roll?

Since none of the surviving fragments represents a complete scroll, we cannot measure the missing portion. Instead, different methods of estimating the length of a partially preserved scroll have been employed. These methods consist of formulas that attempt to calculate the missing interior portion of a scroll using the extant exterior portions. The exterior portion of a scroll is not measurable by these methods.

Checking the Formulas

Two different formulas have been published for estimating the original length of a scroll, given the length of each winding of the preserved intact exterior portions. One has been proposed by the Egyptologist Friedhelm Hoffmann¹² and one by Andrew Cook (a theoretical physicist) and Christopher Smith (a former Unitarian ministerial student).¹³ The two formulas are similar, differing primarily in minor details. Cook and Smith use the thickness of the papyrus (which they did not measure but only estimated) as an indication of the change in diameter to calculate the difference between the lengths of successive windings in the scroll. Hoffmann—knowing that most papyri are already mounted, thus rendering it impossible to measure the thickness—uses the average difference between successive windings for the same purpose.



ROM 978x43.1, the scroll examined by Gee in Toronto. This papyrus fragment depicts the vignette from Book of the Dead 110 (Ptolemaic period). With permission of the Royal Ontario Museum © ROM.

Applying the formulas to the Joseph Smith Papyri presumes the following logic:

- I. If the long roll mentioned by the witnesses (b) is the interior part of one of the mounted portions of the scroll (a),
- II. and if a method accurately calculates the missing interior portion of the scroll,
- III. and if that method is applied equally to all the remaining scrolls of the Joseph Smith Papyri,
- IV. then it might be able to tell us which was the long roll (b) and potentially which was the other scroll (c).

Conditions I-III must be met in order to reach conclusion IV.

Although both formulas have been applied to the fragmented scroll of Horos, neither has previously been applied to an actual intact scroll to confirm the accuracy of predicted length, thus failing to fulfill condition II and invalidating conclusion IV. This has been a war of theories fought on a field lacking empirical facts.

In 2001, in the back rooms of the Royal Ontario Museum, I encountered a rolled scroll whose diam-

eter was about three centimeters. The scroll—ROM 978x43.1, a Ptolemaic period Book of the Dead—has since been unrolled; its length (including the fragmented portions) is about seven meters (roughly twenty-three feet).¹⁴ In November of 2010, I had the privilege of measuring the interior seventy-three windings of that scroll¹⁵ (after that point the scroll is no longer contiguous).

With the data gleaned from this intact roll in Toronto (that is, the individual winding lengths), I applied each of the mathematical formulas, using the assumptions made by the authors of the formulas concerning papyrus thickness, air-gap size, and size of smallest interior winding. I then compared the outcome with the actual interior length of the scroll. The results are shown on the graph (see p. 63).

The fewer the windings that have been measured from the outside of the scroll, the greater the remaining interior scroll length that must be estimated with even less data to predict it. Thus, the predictions of Hoffmann's formula become particularly erratic. It does so precisely in those places where the assumptions of the formula fail to coincide with reality and where the paucity of data magnifies the problem. As can be seen, Hoffmann's formula ap-

proximates the actual length of the papyrus, though it performs better the more data it has to work with. Cook and Smith's formula also improves with more data, ranging from about a quarter of the correct length to about a third of the correct length; nonetheless, this formula glaringly underestimates the length of the scroll. There seem to be some errors in it or in the assumptions upon which it is based.

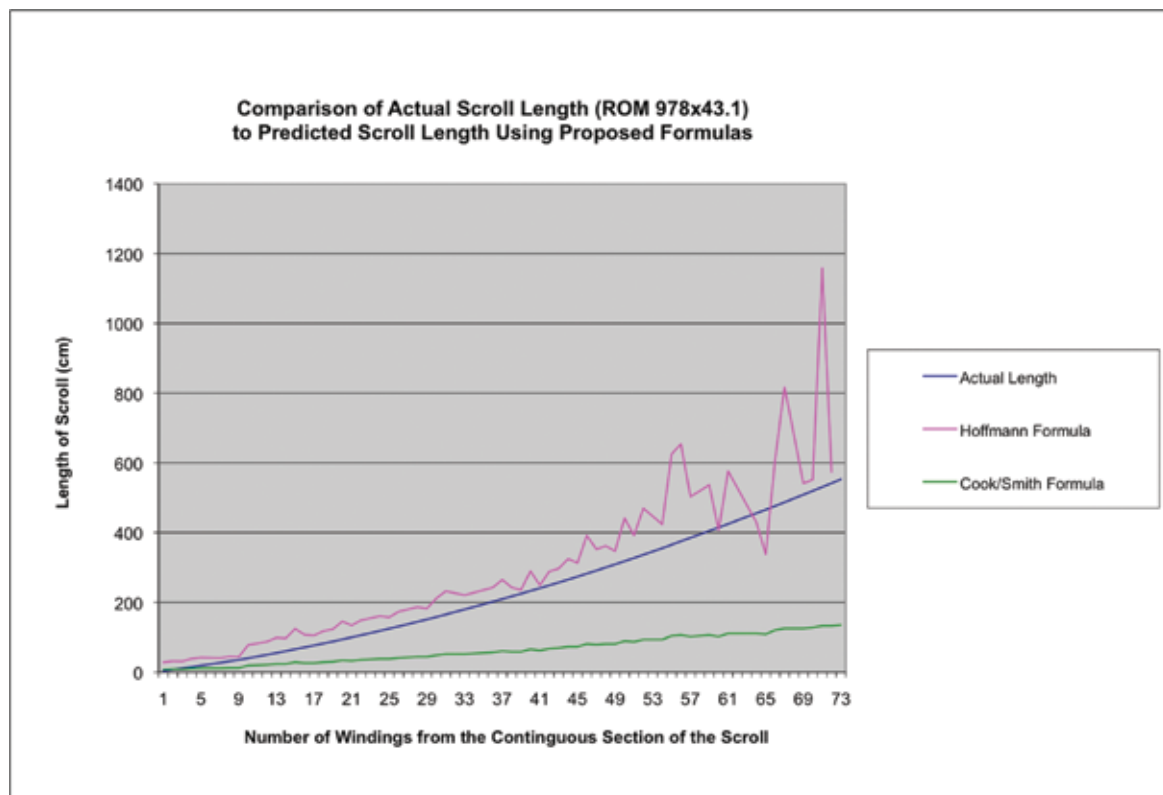
While Cook and Smith's formula predicts a highly inaccurate length, Hoffmann's formula provides a rough approximation. On the basis of observations I have made while measuring various scrolls, I am not convinced that these formulas can ever yield anything more than rough approximations. More empirical data is needed to make refinements in the formulas.

Implications

Although the Cook and Smith method of determining scroll length is anything but accurate (and thus fails condition II), even if it had been successful, it would have created other problems. Cook and Smith fail to establish which was the long roll be-

cause they applied their formula only to the Horos scroll; they did not apply it to any of the other extant scrolls and thus fail to meet another of the necessary conditions (III). They measured only the Horos scroll because they assumed it to be the source of the Book of Abraham. Yet the eyewitnesses identify the long roll as the source. Bent on proving that the Horos scroll was not the long roll, they overlooked the implications of such a view. If the scroll of Horos is not the long roll, it simply cannot be the source of the text of the Book of Abraham (according to the accounts of the eyewitnesses). By endeavoring to prove that the Horos scroll was not the long roll, they would have undermined their own case, which depended on the Horos scroll being the proposed source of the text of the Book of Abraham.

Cook and Smith would like to minimize the length of the Horos scroll because they believe that finding would eliminate the possibility that the Book of Abraham was translated from a scroll that we do not currently have (theory 2). Even if their calculations had been correct and thus had shown that the scroll of Horos was not the long roll observed by the

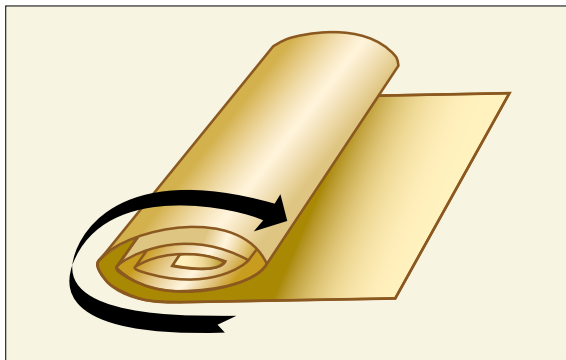




Unopened roll of papyrus stained with bitumen. © The Trustees of the British Museum.

witnesses, that simply would have meant that another scroll would have been the scroll containing the Book of Abraham. So their attempt to eliminate theory 2 as a possibility would not, in fact, have actually been successful even had their formula correctly predicted a short length for the scroll of Horus.

Furthermore, their attempt, even if successful, would not have eliminated the most popular theory—that Joseph Smith received the Book of Abraham by revelation unconnected with the papyri (theory 3). It certainly cannot force anyone to accept the theory that the Book of Abraham was translated from the extant fragments of the Joseph Smith Papyri (theory 1) since that theory is excluded by the historical evidence. So for those who care about such matters, there are still two theories (2 and 3) that are not excluded from consideration.



The amount of papyrus used to wind around the scroll a single time is an individual winding length; the measurements of those have been used to calculate the interior portion of a scroll. Egyptian papyrus scrolls have no wooden stick around which the scroll is rolled; instead, the papyrus is folded over itself, eventually becoming a “flattened” roll.

Another overlooked possibility concerns the assumption (I) that the long roll (b) is the interior portion of any of the fragmentary scrolls (a). This assumption cannot be proven one way or the other but undergirds all attempts to calculate the interior portions of the scrolls. Unfortunately, there is no way to verify this assumption. If the assumption is untrue, then the various attempts to calculate the interior portion of the fragmentary scrolls are, at best, a moot point as far as identifying the Book of Abraham is concerned. Some evidence indicates that this might have been the case. An account from 1846 reports that Lucy Mack Smith “produced a black looking roll (which she told us was papyrus). . . . The roll was as dark as the bones of the Mummies, and bore very much the same appearance; but the opened sheets were exceedingly like thin parchment, and of quite a light color. There were birds, fishes, and fantastic looking people, interspersed amidst hieroglyphics.”¹⁶ While fine papyrus was typically light colored, blackened outsides are characteristic of scrolls that were included in burials and thus were in contact with embalming fluids.¹⁷ This description matches the distinctive characteristics for a scroll with its outer coat still intact. The reported statement that “part of [the scroll] the Prophet had unrolled and read” and that Lucy “had pasted the deciphered sheets on the leaves of a book which she showed us”¹⁸ must mean that the deciphered sheets were the translation rather than part of the scroll, since the roll should have been intact, just as the darkened outer portion was intact. While this witness’s statement raises more questions than it answers, it might

indicate the presence of a completely intact scroll after the death of Joseph Smith.

Conclusions

From this a number of conclusions can be drawn. First, Hoffmann's method of calculating the interior portion of a scroll provides only rough approximations at best. The method of Cook and Smith tends to greatly underestimate the actual length.

Second, there are a number of possibilities for the long roll mentioned by nineteenth-century observers as being associated with the text of the Book of Abraham. While the Horos scroll is possible, other options include the Semminis scroll, the Amenothis scroll, the Neferirtnoub scroll, or another intact scroll. Historical methods, and even mathematical formulas applied to the historical evidence, are not sufficient to prove conclusions.

Those interested in these sorts of questions should constantly bear in mind that the historical

evidence is limited and that limitations on the evidence often preclude definitive answers, or sometimes any answers, to the types of questions that we ask.¹⁹ Scholarship can be useful but is often incapable of answering particular questions. But faith does not require everything to be proved. Ironically, the relationship between the Joseph Smith Papyri and the Book of Abraham is a situation in which both believers and detractors must rely on their faith. ■



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NOTES

1. See John Gee, *A Guide to the Joseph Smith Papyri* (Provo, UT: FARMS, 2000), 21–23.
2. John Gee, “Some Puzzles from the Joseph Smith Papyri,” *FARMS Review* 20/1 (2008): 114.
3. Gee, *Guide to the Joseph Smith Papyri*, 10–13.
4. This name has been reread as Taketem; see G. Vittmann, “Between Grammar, Lexicography and Religion: Observations on Some Demotic Personal Names,” *Enchoria* 24 (1997–98): 101–2.
5. See John Gee, “Eyewitness, Hearsay, and Physical Evidence of the Joseph Smith Papyri,” in *The Disciple as Witness: Essays on Latter-day Saint History and Doctrine in Honor of Richard Lloyd Anderson*, ed. Stephen D. Ricks, Donald W. Parry, and Andrew H. Hedges (Provo, UT: Foundation for Ancient Research and Mormon Studies, 2000), 175–217.
6. Josiah Quincy, *Figures of the Past from the Leaves of Old Journals* (Boston: Roberts Brothers, 1883), 386.
7. Henry Caswall, *The City of the Mormons; or, Three Days at Nauvoo, in 1842* (London: Rivington, 1842), 22.
8. Charlotte Haven, letter to her mother, 19 February 1843, cited in “A Girl’s Letters from Nauvoo,” *Overland Monthly* (December 1890): 624.
9. Haven, letter to her mother, 19 February 1843, 624.
10. Oliver Cowdery, letter to William Frye, 22 December 1835, printed in the *Latter Day Saints’ Messenger and Advocate* 2/3 (December 1835): 234.
11. Jerusha W. Blanchard, “Reminiscences of the Granddaughter of Hyrum Smith,” *Relief Society Magazine* 9/1 (1922): 9; Haven, letter to her mother, 19 February 1843, 624.
12. Friedhelm Hoffmann, “Die Länge des P. Spiegelberg,” in *Acta Demotica: Acts of the Fifth International Conference for Demotists* (Pisa: Giardini, 1994), 145–55.
13. Andrew W. Cook and Christopher C. Smith, “The Original Length of the Scroll of Hôr,” *Dialogue* 43/4 (2010): 1–42.
14. To be published by Irntraut Munro.
15. I would like to thank Krzysztof Grzymiski, Bill Pratt, Janet Cowan, and Gale Gibson of the Royal Ontario Museum for their assistance in this matter.
16. M., *Friends’ Weekly Intelligencer* 3/27 (3 October 1846): 211. I would like to thank Matthew Roper for bringing this source to my attention.
17. “Funerary papyri are prone to extensive staining from the resin poured over a mummy at burial or from fluids from the body.” Richard Parkinson and Stephen Quirke, *Papyrus* (London: British Museum Press, 1995), 79. “Stains are caused by resins used in the mummification and burial ceremonies, and perhaps excretions from the body. Some stains are blackened and almost tar-like.” Bridget Leach and John Tait, “Papyrus,” in *Ancient Egyptian Materials and Technology*, ed. Paul T. Nicholson and Ian Shaw (Cambridge: Cambridge University Press, 2000), 242.
18. M., *Friends’ Weekly Intelligencer* 3/27 (3 October 1846): 211.
19. See also John Gee, “Egyptologists’ Fallacies: Fallacies Arising from Limited Evidence,” *Journal of Egyptian History* 3/1 (2010): 133–58.