Liquid Metaphors and the Politics of Melted Metal

Allison Stielau
University College London, UK

By recording the physical evidence of metal's molten transition between forms, gold and silver ingots offer a material foothold on the metaphors of liquidity and flow used to conceptualize the global circulation of precious metal in premodernity. This article examines the human role in making metal liquid and the political stakes of framing melted artifacts historically and museologically by way of an ingot now in Mexico City that was produced from Indigenous gold during the Spanish conquest.

In a section on precious metals in *The Etymologies*, the seventh-century theologian Isidore of Seville offered the following mythic origin for casting technology:

> The idea of forming metals in molds came about in this way, when by some chance a forest fire scorched the earth, which poured out streams of melted ore in some form. . . . When the metal flowed into the depressions in the ground, it took on the shape in which either the flowing stream or the collecting hollow had formed it. Captivated by [their] splendor . . . people picked up these lumps that had been held fast and saw in them the imprints molded from the ground, and from this realized that metals, when melted, could be made in any shape.[1]

This story could presage humanity's long history of inventive mold making and skillful casting. Read another way, it relates something even more fundamental—the discovery of metal's fusibility. The spontaneously cast forms of Isidore's anecdote evince metal's ability to flow with the application of high heat, making possible endless transformations and recombinations of matter. Isidore's lumps are not manufactured but instead "held fast," implying that metallic forms may be only temporarily halted iterations in a long historical flow. Contemplating coarse masses of metal, the passage suggests, can be both an aesthetic pleasure and a key to understanding the molten dynamics of precious metals.

Fig. 1
Half of an ingot, ca. 1250. Found in Dresden, Germany, 1929. Silver, 1 ¾ × 3 ½ in. (4.4 × 8.7 cm), 8.5 oz (240.95 g). Münzkabinett/ Staatliche Kunstsammlungen Dresden, Germany.

Chunks of unworked gold and silver are not commonly the subjects of visual and historical analysis. Yet premodern ingots can serve as an evocative primary source (fig. 1). Their uneven edges, fissured surfaces, and sometimes heterogeneous material composition index the circumstances of their production, which could be almost as rugged as the act of natural creation that Isidore relates. As artifacts, they are the antithesis of modern industrial ingots, those supremely uninteresting objects, whose highly reflective surfaces and regular edges scumble the boundaries of individual forms until they signify only as solid material. Rarely seen in daily life, modern ingots exist in the imaginary as glittering stacks held under lock and key. While their value transcends the boundaries of national currencies, they are less likely to connote speed and mobility than inertia, like the buried talent of Biblical parable; even with a change in ownership, gold bullion often remains in situ, too valuable and too massive to be removed from its secure location.[2]

Premodern ingots, by contrast, exist as reminders of the velocity and contingency of precious metal forms. The transformative pressures on gold and silver, which is to say the distinctly human forces by which precious resources are valued and allocated, were too great to allow unworked masses of smelted metal to last for centuries above ground. Time and again, they were hurried into other shapes, whether metallic currency or articles of decoration and use. For this reason, they do not survive outside archaeological contexts, whether in buried hoards or shipwreck sites. The findspots of precious metal ingots highlight their intense ephemerality and their status as objects *in between*, whether in the merchant's hoard abandoned in the wake of Black Death pogroms or in the hold of a ship that aimed to deliver precious metals from the Americas back to Europe.[3] Such discoveries breathe new life into the seemingly dead financial terminology of liquidity, currency, and (cash) flow.

Fig. 2
Ingot, ca. November 1519–June 1520. Found in Mexico City, 1981. Gold, 2⅛ × 10⅜ × ½ in. (5.5 × 26.2 × 1.4 cm), 67.7 oz (1,920 g). Museo Nacional de Antropología, Mexico City, inv. no. CONACULTA-INAH 11.0-05343.

Ten inches (twenty-five centimeters) long and weighing over two pounds (nine hundred grams), the gold ingot residing in Mexico City's Museo Nacional de Antropología bears no marks and takes only the loosest of manufactured forms (fig. 2). Its pockmarked mass appears as a glistering blur in certain photographs and conveys the craggy dullness of a used kitchen sponge in others. Unlike modern bullion, this so-called bar does not lie flat and therefore cannot be stacked. The English word "bullion," which likely derives from the medieval Latin *bullio* (a "boiling" or quantity of boiled material), developed strong associations with melting and thus to the mint and other sites where metal was turned to liquid and purified.[4] The Mexican ingot records its own thermal history—the change of state from liquid to solid that created it. Small beads and fragments embedded in the upper surface indicate that the gold melted inconsistently, while the lower surface archives the tunnels made by water vapors trying to escape up through the metal as it cooled. This ingot's transitional state has stilled metallic flow to the point where its ephemeral features can be viewed and even touched.

Surviving ingots from the period of the Spanish conquest and colonization of the Americas can be placed into two groups. The first are the bars of freshly mined silver produced in Potosí, Bolivia, and other sites where European mining techniques were imposed on the landscape and local population. The metal there underwent rigorous procedures of purification and assaying before the bullion was carried out to the coast on llama pack trains and eventually put on ships to create the oft-cited "flow" of precious metal back to Europe.[5] The silver bars found in the wreck sites of Spanish treasure galleons—like the *Atocha*, which sank in 1622 and was found in the 1980s—bear marks tracing their journeys from mold to maritime cargo.[6] The other group of ingots was produced earlier, during and shortly after the conquest. They consist of metal derived from existing Indigenous articles that were melted down to form ingots that facilitated both the divvying up and transportation of booty and the payment of the royal tax due on all extracted precious metal.[7] These ingots are often identifiable through metallurgical analysis of their alloys, which match those used in contemporaneous Indigenous metalworking, which was known, in contrast to the European focus on metallic purity, to mix metals for their cosmic and divine properties.[8]

The Mexican ingot is thought to be the product of treasure liquidated during the invasion of Tenochtitlán in 1519. This event is narrated in the book known as the Florentine Codex (*Historia general de las cosas de la Nueva España*), which was produced in the late 1570s by Nahua artists and scribes under the direction of Bernardino de Sahagún and accompanied by a dual Spanish-Nahuatl text. The twelfth book of the codex has been called "the most extensive indigenous

Fig. 3
Florentine Codex, book 12, *The Conquest of Mexico*, fol. 28, "Melting Down Mexica Metalwork," 1577. Pigment and ink on European paper. Biblioteca Medicea Laurenziana, Florence.

account of the Spanish-led war" on the Aztec.[9] Recounting how Hernán Cortés and his troops captured the emperor Moctezuma and seized his gold treasure, the text states: "Thereupon was the gold torn from the shields and from all the devices; and as all the gold was detached, they then burned—set fire to and consumed in flames—all the various precious things [from which the gold was taken]. It all burned. And the gold the Spaniards melted into bars."[10] Other sources have explained that local smiths from Azcapotzalco were fetched to carry out this extraction and consolidation of gold over three days, which resulted in a total sum of about 1,492.5 pounds (677 kilograms).[11] The European privileging of precious metal above all other materials valued by the Aztecs—feathers, stones, textiles, and woods—is a scenario that would play out again and again in encounters between Indigenous and Spanish actors in subsequent decades.

A drawing in the Florentine Codex condenses the extraction of Aztec gold into an economical square, depicting metal's passage through the fire (fig. 3). A figure with a plumed helmet and staff, coded Spanish by his armor, points toward the flames in front of him, as if confirming that the object being held up for his inspection should also be melted down.[12] At his feet a smith with a Nahua haircut (and Spanish dress) sits near the forge, which presumably holds both charcoal and broken-down metalwork, blowing air with a pipe to encourage the flames, a technique known to have been employed in pre-Columbian metallurgy and depicted elsewhere in the codex.[13] From a hole in the forge's base, molten metal flows into a rectangular mold. The crescent, leg, and arm in the

foreground represent the ornaments being melted down: the "golden leg bands, golden arm bands, golden head bands" that are mentioned in the Nahuatl narrative. This drawing is rare in sixteenth-century representation for both its portrayal of the unmaking of metalwork and the making of ingots. By showing body ornaments and molten metal concurrently, the image secures the connection between the forms dissolving in the crucible and the even-more-fleeting form that the metal took as it flowed out—the rough ingot. The image both comments on the destruction that it represents and proposes a clever bulwark against it. The ornaments being melted down are portrayed as still attached to their relevant body parts, which makes clear their function but also the profound violence and fragmentation of the social fabric at work in this event. Here the metal is granted a simultaneity that we know to be impossible, in which the depicted volume of gold is at once the Aztec body ornaments and the ingot being produced out of their extracted material.

The textual and museological framing of the surviving Mexican ingot has similar political stakes. Unearthed during excavations in Mexico City in 1981, the ingot is often associated with the *Noche Triste*, the night in June 1520 when the Spanish were temporarily driven out of Tenochtitlán with such haste that many men and horses drowned in the canals, leaving their heavy booty behind, including the gold bars made from liquidated Aztec ornaments.[14] This ingot has appeared in international loan exhibitions on pre-Columbian art, but the logic of its presence therein deserves more precise explanation.[15] It is, after all, a crude lump, bearing little obvious trace of human intervention: no stamped letters or numerals, nor figural or abstract ornament of any kind. Even the deep dimple of an assayer's "bite" is absent. An obdurate object in utter contrast to the finely crafted Indigenous metalwork it is often displayed beside, the ingot gains meaning by way of juxtaposition. If the sophistication and vibrancy of Indigenous metalwork metonymizes the civilization in which it was made, the ingot materializes its catastrophic end and becomes a relic of the artifacts that it contains. Its formlessness and illegibility further serve to symbolize so much of what is unknowable about the violent rupture caused by European contact.

In Mexico City, the ingot is now on permanent display surrounded by pre-contact cast and embossed gold ornaments. At the base of the vitrine, a small globule of melted gold in a clay vessel, which goes unmentioned in the accompanying wall text, serves to link the exquisite surviving artifacts to the amorphous bar that they encircle. The tableau is reminiscent of the Florentine Codex image and composes an analogous narrative, where either side of the metal's metamorphosis—ornament (beginning), ingot (end)—turns on the forge and the gold's melting point.

To understand the work of this historiographical move, which is never explicitly verbalized, we must acknowledge the slippage on which it depends. Thanks to its findspot and its metallurgical and formal features, the ingot's association with the conquest is not under dispute. Although of high purity, the bar contains traces of copper and iron, which indicate that it was produced from Indigenous alloys in an extremely limited smelting context, with few resources in terms of time, fuel, and furnace. The bar's slight curvature is yet another sign of

urgency: the still-warm bar was likely lifted out of its mold—probably a narrow channel in wet sand—with a knife or other tool before it had entirely cooled.[16] Advances in metallurgical science mean that the metal's origins, whether direct from the mine or extracted from existing objects, can be pinpointed with increasing accuracy.[17] Still, the analysis of isotopes and alloys has limitations and will never effectively track the prior forms of individual objects once they have succumbed to the heat of the furnace.[18] The museum's display nevertheless makes the assertion, visually and compositionally, that the ingot's material heritage can be located in objects that are still available to human perception. The fact of this subtle fiction is less interesting than its purpose. Although the informational vacuum that forms in the wake of metal's melting represents a significant loss, it also opens a space in which claims about metallic provenance that serve to process that loss can generate.[19] To make the erased forms of liquidated pre-Columbian metalwork visible and graspable again is a profoundly reparative act that retains its force despite its defiance of the usual epistemological requirements for identifying material objects.

The Mexican ingot speaks not only to the date of its creation and loss in the waters of Tenochtitlán's canals—and to the fact that it was only under duress that the Spanish relinquished their confiscated treasure—but also, like all excavated artifacts, to the moment of its rediscovery. This ingot emerged into a postcolonial present attuned to the trauma of the conquest and trained on recognizing and recovering vestiges of the Americas before European contact. The increasing traction of this ongoing effort might be read in the ingot's recent identification in a catalogue entry as "Aztec and Spanish."[20] These three words register an important departure from previous descriptions of the ingot and an alternative to traditional notions of cultural hybridity. What was once "early colonial" has been pulled back to the period of initial contact, before the colonial project was conceived and consolidated. Highlighted here is the moment that metal moved from one culture—and relevant function, meaning, and system of value—to another.[21] The fact that the Spanish bullion is the only visibly recognizable survival of this event captures the inescapable asymmetry of the conquest. "Aztec" resists the erasures of the furnace and bids the viewer to acknowledge the existence of objects that can no longer be sensorially apprehended. "Spanish" reminds us that although the gold is close in appearance to a nugget or mining specimen, it is a made object far from its native state. The designation "Aztec and Spanish," finally, does not assert hybridity so much as explore the imaginative possibilities of flux, which includes a compensatory simultaneity where Indigenous treasure is both present *and* destroyed.[22]

Preserving the shape of the earthly depression into which its metal flowed, the Mexican ingot shares affinities with Isidore's acheiropoetic cast forms. The lessons it teaches about metal's fusibility, however, concern the social and political forces involved in metallic transformation. Calling on metaphors of fluidity to describe the movement of precious metal in the premodern world risks obfuscating the human structures within which metal was made liquid. The movement of bullion from Indigenous artifacts and colonial mines to the Spanish treasury was not, in other words, the inevitable rush, as of water down a hillside, suggested by the word *flow*, or by Isidore's imagined metallic rivulets. While

ingots may record the physical fact of metal's momentary moltenness, they can also reveal points of friction in the global transit of precious metal. Gold and silver were kept moving only through intense investments of fuel and human labor, which often took place within systems of coercive control.

Some of the forces required to overcome the friction in circulation—the inevitable *held fastness* of solid metal—are nested in the Florentine Codex image: the burning coals beneath the forge, which are coaxed by the Indigenous smith, who is commanded by the Spaniard's pointing finger, and its implied threat, above. A tiny crescent indicates the smith's puffed cheek, expanded to blow air to spur the flames.[23] The human breath harnessed in metallurgical practice—this may be the most compelling detail on which to hang a more anthropocentric narrative of metal's melting. What it could bring to the Mexican gold ingot, now reframed as *Aztec and Spanish*, is proximity not just to lost Indigenous artifacts and the destruction of the conquest, but also to the very life force of the melter's body, fleeting though it may be, and invisible and immaterial as air. ■

Allison Stielau

Allison Stielau is lecturer in early modern art at University College London. Her current book project concerns metallic transformation in the early modern world.

1 Isidore of Seville, "Book XVI: Stones and Metals," in *The Etymologies of Isidore of Seville*, trans. Stephen A. Barney et al. (Cambridge: Cambridge University Press, 2006), 329–30. This passage rephrases Lucretius, *On the Nature of Things* 5, sections 1241–65.
2 Matt. 25:14–30.
3 *Die mittelalterliche jüdische Kultur in Erfurt*, vol. 3, *Der Schatzfund: Die Münzen und Barren*, ed. Sven Ostritz (Langenweißbach, Germany: Beier & Beran, 2012).
4 *Oxford English Dictionary*, s.v. "bullion (n. 1–2)."
5 Ward Barrett, "World Bullion Flows, 1450–1800," in *The Rise of Merchant Empires: Long-Distance Trade in the Early Modern World, 1350–1750*, ed. James D. Tracy (Cambridge: Cambridge University Press, 1990), 224–54.
6 *Gold and Silver of the* Atocha *and* Santa Margarita (New York: Christie's, 1988).
7 Vitus Huber, *Beute und Conquista: Die politische Ökonomie der Eroberung Neuspaniens* (Frankfurt, Germany: Campus, 2018), 272–86; Douglas R. Armstrong, *Tumbaga Silver for Emperor Charles V of the Holy Roman Empire: The Study of a Large Trove of Early Sixteenth-Century Spanish Silver Bars Recovered from a Shipwreck off Grand Bahama Island* (Palm Bay, FL: Douglas R. Armstrong, 1993).
8 Ana María Falchetti, "The Seed of Life: The Symbolic Power of Gold-Copper Alloys and Metallurgical Transformations," in *Gold and Power in Ancient Costa Rica, Panama, and Columbia*, ed. Jeffrey Quilter and John W. Hoopes (Washington, DC: Dumbarton Oaks, 2003), 345–81.
9 Kevin Terraciano, "Three Texts in One: Book XII of the Florentine Codex," *Ethnohistory* 57, no. 1 (Winter 2010): 51–72, esp. 51.
10 Bernardino de Sahagún, *The Florentine Codex: General History of the Things of New Spain*, trans. and ed. Arthur J. O. Anderson and Charles E. Dibble, 13 volumes (Santa Fe, NM: School of American Research; Salt Lake City: University of Utah, 1950–83), 13:46. For a more literal translation, see James Lockhart, trans. and ed., *We People Here: Nahuatl Accounts of the Conquest of Mexico* (Berkeley: University of California Press, 1993), 122–23. For more on molten metal in the Florentine Codex, see Allison Caplan's new translation of book 9, chapter 16, presented in this issue; Allison Caplan, "Blowers of Sun-Excrement: Nahua Lost-Wax Gold Casting in the Florentine Codex Book 9, Chapter 16," *West 86th* 28, no. 2 (Fall–Winter 2021): 215–31.
11 Leonardo López Luján and José Luis Ruvalcaba Sil, "Mexica Gold," in *Golden Kingdoms: Luxury Arts in the Ancient Americas*, ed. Joanne Pillsbury, Timothy Potts, and Kim N. Richter (Los Angeles: J. Paul Getty Museum and Getty Research Institute, 2017), 111–21, esp. 111, 120n3.
12 This is the figure Kevin Terraciano calls "Ironman." See Kevin Terraciano, "Reading between the Lines of Book 12," in *The Florentine Codex: An Encyclopedia of the Nahua World in Sixteenth-Century Mexico*, ed. Jeannette Favrot Peterson and Kevin Terraciano (Austin: University of Texas Press, 2019), 45–62, esp. 55.

13 Christopher B. Donnan, "A Pre-Columbian Smelter from Northern Peru," *Archaeology* 26, no. 4 (October 1973): 289–97.
14 Francisco González Rul, *En Busca de un Tesoro Perdido* (Mexico City: Instituto Nacional de Antropología e Historia, 1994).
15 See *Aztecs*, ed. Eduardo Matos Moctezuma and Felipe Solís Olguín (London: Royal Academy, 2003, 483, cat. no. 333; *Moctezuma: Aztec Ruler*, ed. Colin McEwan and Leonardo López Luján (London: British Museum, 2009), 276, cat. no. 121; and Pillsbury, Potts, and Richter, eds., *Golden Kingdoms*, 268, cat. no. 223.
16 Rul, *En Busca*, 53, 55–56.
17 Robert Lehmann, "Archäometallurgie von mittelalterlichen deutschen Silberbarren und Münzen" (PhD diss., Gottfried Wilhelm Leibniz Universität Hannover, Germany, 2011).
18 Peter Bray et al., "Form and Flow: The 'Karmic Cycle' of Copper," *Journal of Archaeological Science* 56 (April 2015): 202–9.
19 Allison Stielau, "'Adding to the Good Silver with Other Trickery': Purity and Contamination in Clement VII's Emergency Currency," in *Contamination and Purity in Early Modern Art and Architecture*, ed. Lauren Jacobi and Daniel M. Zolli (Amsterdam: Amsterdam University Press, 2021), 157–82, esp. 176.
20 See the entry by Allison Caplan in Pillsbury, Potts, and Richter, eds., *Golden Kingdoms*, 268.
21 McEwan and López Luján, eds., *Moctezuma*, 276, cat. no. 121.
22 This museological framing of the ingot can be usefully contrasted with many of the instances of cultural hybridity analyzed in Carolyn Dean and Dana Leibsohn, "Hybridity and its Discontents: Considering Visual Culture in Colonial Spanish America," *Colonial Latin American Review* 12, no. 1 (2003): 5–35. Here, the Indigenous contribution is acknowledged despite its lack of visible evidence in order to emphasize, rather than downplay, the destructive force of Spanish hegemony, which is a move made possible by the ingot's materiality and unique circumstances of production.
23 I thank Matthew H. Robb for pointing out the smith's puffed cheek to me in one of many generous conversations about this image. Further thanks for their thoughts and suggestions over several years of pondering premodern ingots go to Kevin Terraciano, and Aaron Hyman and Emily Floyd, who both also generously shared research materials related to the Mexico City ingot. Audience members and fellow speakers at the conference "Material Flows," organized by Angela Vanhaelen and Bronwen Wilson at the University of California, Los Angeles, in February 2019, deeply informed my thinking on this topic. Caspar Meyer and Ittai Weinryb gave me the opportunity to think through it further and I thank them for this and their comments on the text.