

Rammed Earth - Crafting Value

Martin Rauch's Role in Valorising Rammed Earth

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Introduction:

This dissertation studies the rammed earth of the Chapel of Reconciliation in Berlin (see fig.1), built in 2000 and designed by ceramicist Martin Rauch, in order to ask what values we ascribe to rammed earth construction. Rammed earth is a traditional building method that involves compressing layers of earth within a temporary wooden framework. It is a popular topic in recent literature, primarily praised for its impeccable sustainable qualities. However, its aesthetic and spatial possibilities receive less attention – it is rarely discussed for its beauty. Rauch, a kiln builder and sculptor in ceramics, is passionate about the qualities of rammed earth; the Chapel of Reconciliation is likely his best-known work.

The dissertation begins with the Chapel of Reconciliation to explore the potential applications of rammed earth and the reasons behind its use. The emphasis on valorisation is drawn from Norma Barbacci's essay, "Earthen Architecture – Valorisation and Underestimation."¹ Barbacci suggests that earthen architecture, though sustainable, thermally excellent, culturally significant, and affordable, is underestimated and linked to poverty due to misconceptions.

My own assessment of value and of valorisation begins to ask what it is that we are valuing when we value rammed earth. I am interested in the way in which, as architects, we tap into and help to shape values and can thus influence the way in which resources are used. If the classical triad of value – the values that we inherit from the philosophers of classical antiquity, links goodness, beauty and truth, we also need to ask "good for what? beautiful to whom? True to what?"² By studying different uses of rammed earth and talking to various stakeholders involved in the building or use of the Chapel of Reconciliation, I start to think through the significance of these different values.

What does it mean to valorise?

The Oxford Dictionary defines value as the "worth or quality as measured by a standard of equivalence. The material or monetary worth of something; the amount at which something may be estimated in terms of a medium of exchange, as money or goods or some other similar standard."³ This definition seems to describe the economic site of the value principle, defining value through worth based on the supply and demand of goods. Using the word "something" twice insinuates that products or services are meant. From a psychological perspective, the plural form values "are cognitive representations of basic motivations as goals to be pursued."⁴ Furthermore, the journal article states that "prominent theories of cultural values {...} agree in viewing the prevailing value emphases in a society as the most central feature."⁵

1 Norma Barbacci. „Earthen Architecture - Valorisation and Underestimation.“ International archives of the photogrammetry, remote sensing and spatial information sciences (Santiago, March 22nd to 26th, 2020)

2 A. O'Hear, Philosophy: "The Good, the True and the Beautiful" (Cambridge University Press, 2010).

3 Oxford English Dictionary, s.v. "value (n.)," June 2024, <https://doi.org/10.1093/OED/5277092424>.

4 Lilach Sagiv and Shalom H. Schwartz, "Personal Values across Cultures," Annual Review of Psychology 73,517-46 (2022): p. 519.

5 Lilach Sagiv and Shalom H. Schwartz, "Personal Values across Cultures," Annual Review of Psychology 73,517-46 (2022): p. 519.



Fig. 1 The Chapel of Reconciliation

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When looking up the words valorisation and evaluate, it becomes clear that differences in meaning exist. Valorisation is defined as “the act of fixing the value or price of some commercial commodity. Also, gen., evaluation, giving validity, making valid.”⁶ This definition again uses an economic context to describe the meaning of valorisation. Furthermore, two words, valid and validity, from the same word group are introduced to describe the meaning of valorisation. So, how do those to differ in meaning and fit in the context? Both can refer to something legally acceptable or having a reasonable, logical basis.⁷ The term valid may be viewed as a descriptor for something that conveys truth in a particular context.

Given that parts of this dissertation are rooted in a German geographical and linguistic context, grasping the meanings of these words in German could enhance our understanding. The term ‘valorisation’ can be translated into German in two distinct ways: it may mean ‘Aufwertung’, which refers to the ‘enhancement of value’, or ‘Verwertung’, meaning the “use of waste”. Literally, ‘Aufwertung’ translates to ‘up-rating’. Grasping these wording distinctions is essential for addressing the dissertation’s question regarding ‘valorisation’.

What do we mean by value?
There are ways of fixing value for exchange, e.g. through money
But there are also ways of recognising that values are not fixed, they change according to context.
In this way, if rammed earth is to be ‘given value’, it is being ‘valorised’ – value, or worth, is being ascribed to it that might not always be there. This is very clear in the German words used for ‘valorisation’.

When we recognise that value, or a large part of value, is not inherent to the material, but is ascribed to it, we can ask what value is being ascribed to rammed earth, who is giving it this value (who thinks it is good, or beautiful, or true), and in what context? Why does it seem important to give rammed earth this value?

Part 1: Berlin’s Chapel of Reconciliation

Built in 2000 on the former death strip of the Berlin Wall, the Chapel of Reconciliation stands on the foundation of the old Church of Reconciliation, which was demolished in 1985. The GDR regime destroyed the Neogothic church (see fig. 2) due to its symbolic value of reconciliation.
After the fall of the Berlin Wall in 1989, a no-man’s land developed on the former death strip of the wall. The Chapel was constructed to open a space for remembrance and reconciliation of the past trauma experienced in this location.⁸

The Chapel of Reconciliation is located on a site marked by historical vio-



Fig. 2 The Old Chapel of Reconciliation in Demolition



Fig. 3 The Chapel of Reconciliation

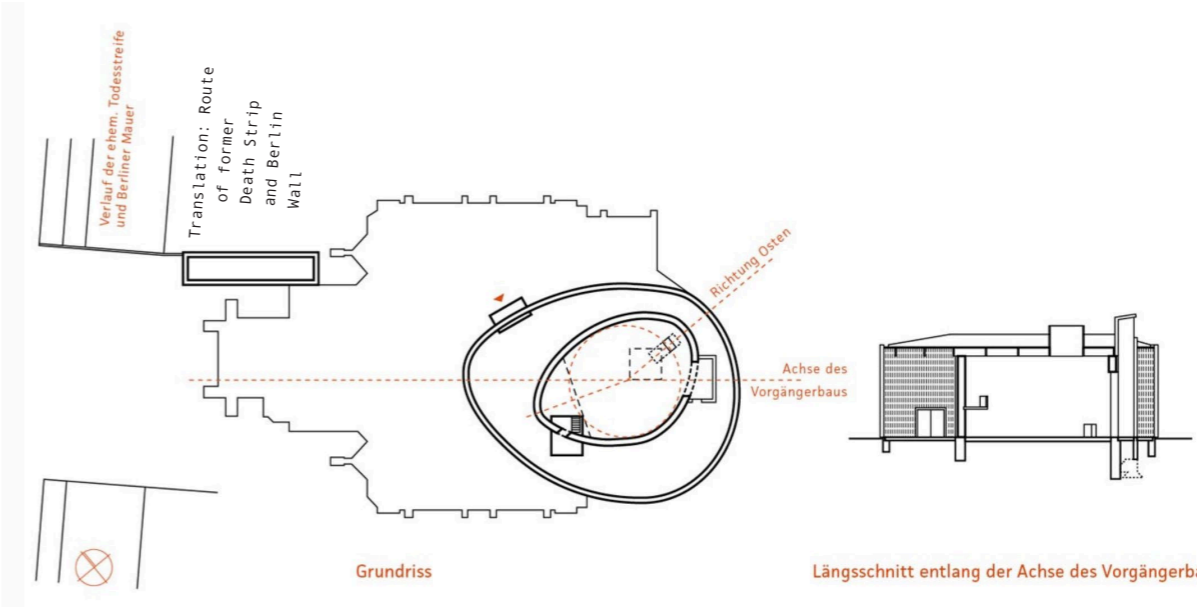


Fig. 4 Plan and Section of The Chapel of Reconciliation (not to scale)

⁶ Oxford English Dictionary, s.v. “valorization (n.),” July 2023, <https://doi.org/10.1093/OED/4219200858>.
⁷ Oxford English Dictionary, s.v. “valid (adj.),” September 2023, <https://doi.org/10.1093/OED/1112616721>.
⁸ Paraphrased translation from: Dr. Petra Bahr, “Die Kapelle der Versöhnung”, 1st Edition (Allgäu: Kunstverlag Josef Fink, 2008), p.29.

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lence and trauma. On the east side of Bernauer Straße, one will find the attractive and well-developed district of Berlin Mitte. In contrast, the west side, known as Wedding, faces significant vacancy challenges.

In between lies the remains of the Berlin Wall today (see fig.3 and 4), still a wound of the city.⁹

The number of municipality members has vastly decreased, and financial means are low. Therefore, the goal was to build a modern chapel that represented the inner conflicts in its appearance with limited means.

After the horrors of the Berlin Wall and the GDR regime, the experience of a philanthropic and healing boundary is needed. A monumental church type was dismissed, and a chapel was chosen for its humble scale and quality to serve sacred objects of the past. The word “chapel” stems from the Latin cappa, which translates to coat. It serves as a protective layer to the holy artefacts and people (see fig. 5).¹⁰

The chapel was designed by Berlin-based architects Reiterman and Sassenroth. It is constructed of a massive oval rammed earth wall that rises seven meters and is 60 centimetres thick. A wood lamellae façade surrounds the chapel’s rammed earth body (see fig. 6).

The surrounding wood lamellae create a space of two to five-meter-thick covered walkways. This walkway depicts a transition zone between the sacred interior space and the violent history of the surrounding environment. Furthermore, the facade protects the rammed earth interior construction from the exterior weather conditions.¹¹

The main axes of the chapel are created through a traditional east-west and orthogonal orientation. ¹² The new Chapel of Reconciliation is built on the old plan of the former chapel. Deliberately shifted, the new chapel creates a distinct contrast between the old and the new.¹³ The previous path leading to the chapel, once patrolled by border soldiers, was intentionally left exposed—images of past and present overlap. Scenes of border soldiers patrolling overlap with happy confirmands on a Sunday morning.¹⁴

Austrian artist Martin Rauch created the interior oval-shaped rammed earth construction. From August to October, he worked with voluntary helpers on the rammed earth walls.

Martin Rauch creates rammed earth structures and elements—his passion for the material developed through his work as a ceramicist, kiln builder, and sculptor. Growing up in the rural Vorarlberg region in Austria influenced his vast economy of resources.

During his volunteering period for a development organisation in Africa, Rauch experienced the “close-knit life cycles making optimal use of resources” using



Fig. 5 Rammed Earth Body of the Chapel

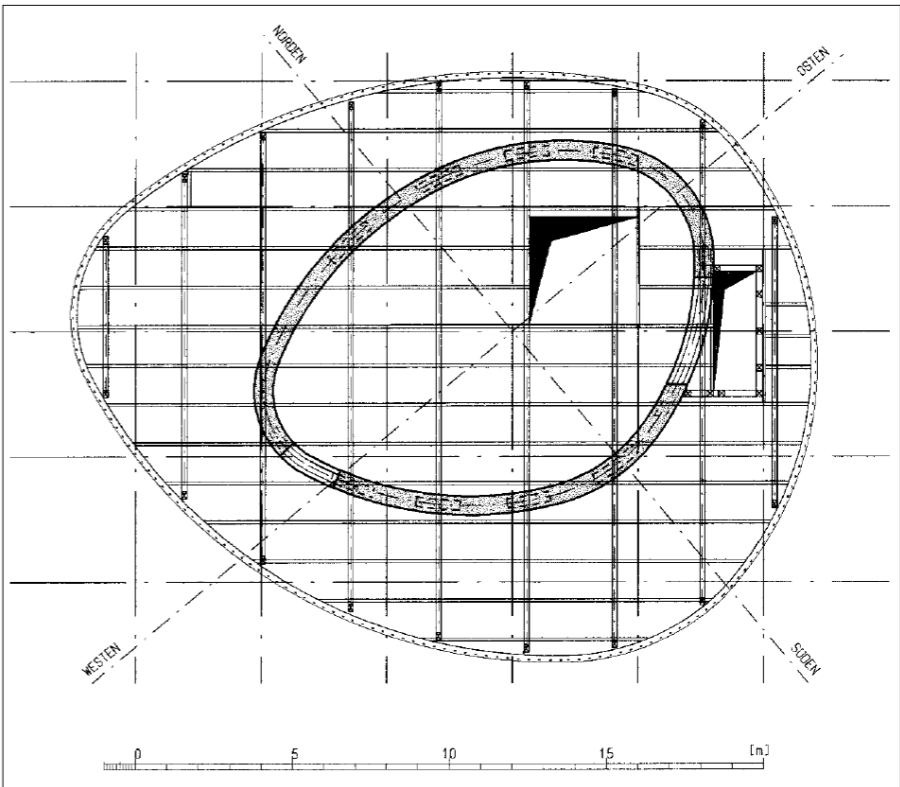


Fig. 6 Plan of the Chapel of Reconciliation

9 Paraphrased translation from: Dr. Petra Bahr, “Die Kapelle der Versöhnung”, 1st Edition (Allgäu: Kunstverlag Josef Fink, 2008), p.28,29.

10 Paraphrased translation from: Dr. Petra Bahr, “Die Kapelle der Versöhnung”, 1st Edition (Allgäu: Kunstverlag Josef Fink, 2008), page reference.

11 Paraphrased translation from: Andreas Schulz, “Die Kapelle der Versöhnung in der Bernauer Straße in Berlin Mitte - Ein Konstruktionsbericht”. Berlin: Ernst und Sohn Verlag für Architektur und technische Wissenschaften, 2001, p. 3-4.

12 Paraphrased translation from: Andreas Schulz, “Die Kapelle der Versöhnung in der Bernauer Straße in Berlin Mitte - Ein Konstruktionsbericht. Berlin: Ernst und Sohn Verlag für Architektur und technische Wissenschaften”, 2001, p. 3-4.

13 Paraphrased translation from: Dr. Petra Bahr, “Die Kapelle der Versöhnung”, 1st Edition (Allgäu: Kunstverlag Josef Fink, 2008), p. 41

14 Paraphrased translation from: Dr. Petra Bahr, “Die Kapelle der Versöhnung”, 1st Edition (Allgäu: Kunstverlag Josef Fink, 2008), p. 42, 45.

the material earth.¹⁵

The small financial means keep threatening the project during its construction period. The project remains viable solely through creative and collective efforts. One of these initiatives repurposes the remaining foundlings from the old chapel, transformed by renowned artists, including A.R. Penck, Norbert Bisky, and Elvira Bach. The foundlings were given individual designs, destroying their former anonymity and purpose. These artworks were intended to be sold separately to raise funds for ongoing construction. However, a couple buys the stones altogether to keep the ensemble united and support the building process of the chapel.¹⁶

Part 2: The Practical Considerations of Building with Rammed Earth

Strengths of Rammed Earth:

Earth is abundantly available in many regions of the world. Unlike typical modern building materials, it poses no restrictions regarding costs, industrial processing, or transportation. These attributes enable the construction of vernacular rammed earth structures, built using traditional techniques that have been handed down through generations. ¹⁷

Rammed Earth is also known for its immaculate thermal qualities. It absorbs and releases heat as the outside temperature changes. Furthermore, it functions as an absorbent material that regulates humidity. The material is free from toxic elements and poses no risk to human health. It naturally qualifies as sound insulating without any additional treatment.

Above all, earth compositions can be completely recycled, reused, or reshaped. The material life cycle is endless; it never truly disappears. While it can transform in form or function, it consistently retains the potential for future reform.¹⁸

All those qualities make “the universal value of earthen architecture {...} evident and deserves the recognition, protection and conservation of the international community” according to Norma Barbacci.¹⁹

Weakness of Rammed Earth:

However, rammed earth has what could be considered a major weakness. Its susceptibility to water requires the material to be protected from the influence of rain and wind. These weather conditions cause erosion, which can result in damage.²⁰

This sensitivity to water gives the material its unique ability to change

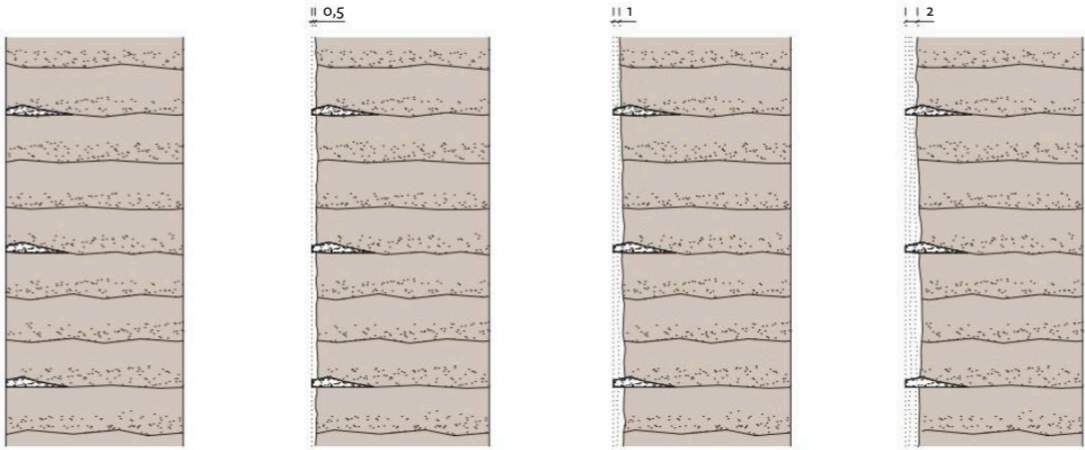


Fig. 7 Rammed Earth Erosion Diagram

15 „LehmTonErde,“ accessed October 18th, 2024, <https://www.lehmtonerde.at/de/>.

16 Paraphrased translation from: Dr. Petra Bahr, “Die Kapelle der Versöhnung“, 1st Edition (Allgäu: Kunstverlag Josef Fink, 2008), p. 37.

17 Norma Barbacci. “Earthen Architecture - Valorisation and Underestimation.” International archives of the photogrammetry, remote sensing and spatial information sciences (Santiago, March 22nd to 26th, 2020), p. 2.

18 Norma Barbacci. “Earthen Architecture - Valorisation and Underestimation.” International archives of the photogrammetry, remote sensing and spatial information sciences (Santiago, March 22nd to 26th, 2020), p. 2.

19 Norma Barbacci. “Earthen Architecture - Valorisation and Underestimation.” International archives of the photogrammetry, remote sensing and spatial information sciences (Santiago, March 22nd to 26th, 2020), p. 2.

20 Norma Barbacci. “Earthen Architecture - Valorisation and Underestimation.” International archives of the photogrammetry, remote sensing and spatial information sciences (Santiago, March 22nd to 26th, 2020), p. 3.

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plasticity endlessly, resulting in complete circularity. Efforts to enhance the clay's resistance to water abrasion by adding cement can compromise its plasticity. Nonetheless, there are methods to safeguard the rammed earth structurally from weather elements.

Erosion happens in the façade when water runs down to quickly erasing material. Consequently, horizontal layers serve as erosion protection (see fig. 7) in Martin Rauch's contemporary rammed earth walls. After the initial years, these walls gradually form a natural erosion defence. The upper clay layer undergoes minor erosion, exposing a coarser texture with stones and pebbles beneath. This gradual process enables the wall to "safeguard itself against being washed away".²¹

Erosion is an intentional factor in contemporary rammed earth construction, carefully considered in the planning phase. This process allows rammed earth walls to achieve their ultimate appearance after several years.

Most importantly, rammed-earth constructions must avoid water or moisture at the top and from the foundation. When these measures are effectively implemented in constructing rammed earth structures, they will require minimal maintenance for decades.²²

The possible fragility associated with sensitivity to moisture could also be interpreted as a positive quality used specifically to build with the intention of decay and erosion. This approach enhances and values the material's natural qualities. This fragility is an ascribed value. When build correctly there is minimal fragility. It is perceived that way through and therefore counts as a value.

Francois Cointeraux and Pisé de Terre:

Rauch's rammed earth construction is informed by the pisé technique of the 18th-century French architect Francois Cointeraux. This technique, also called "pisé de terre," involves layering moist earth and compressing it within a temporary framework to form solid, load-bearing walls (see figure 8). During Cointeraux's time, its popularity rose significantly in Spain and France, mainly because of a wood shortage. However, he was unable to achieve long-term or widespread popularity with his building technique. He was missing the needed government but also societal support. The focus lay on building affordable housing for the rural regions, which didn't align with the elite's vision of aesthetically rich architecture. Napoleon went as far as calling Cointeraux's work a "city of mud" accusing him of having wasted means.²³

Revisiting the concept of value and the question "good for what?", Cointeraux successfully built structurally 'good' rammed earth buildings.²⁴ In today's context, Martin Rauch proves that rammed earth construction can be structurally 'good' when built correctly.

Although it is clear that rammed earth can be structurally useful, there still seems to be a misconception that it is a primitive material that is not structurally appropriate in a Western context. Its goodness in being structurally useful doesn't seem to be perceived in a broader context from a Western per-

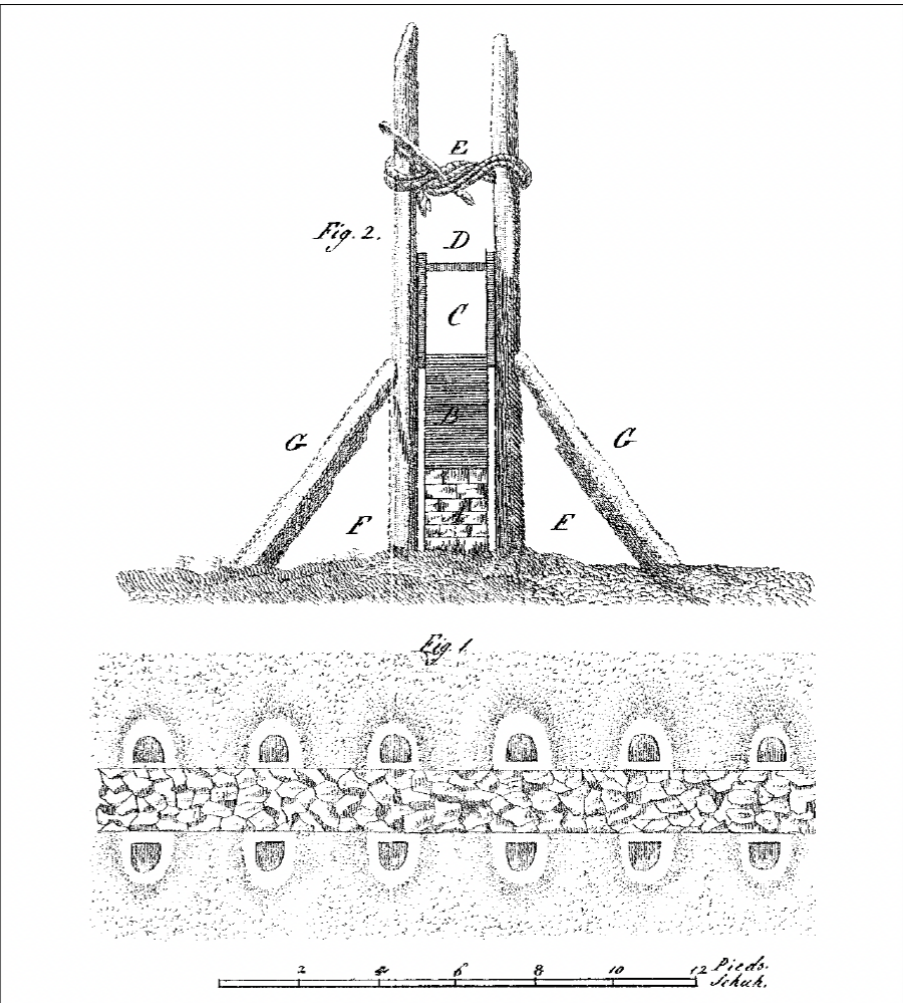


Fig. 8 Pisé de Terre

21 „LehmTonErde,“ LehmTonErde, accessed November 7th, 2024, <https://www.lehmtonerde.at/de/lehm/lehm.php?alD=41>.

22 „LehmTonErde,“ LehmTonErde, accessed November 7th, 2024, <https://www.lehmtonerde.at/de/lehm/lehm.php?alD=41>.

23 Drawing Matter, “François Cointeraux: The Architect of the Agricultural Proletariat”, accessed December 22nd, 2024, <https://drawingmatter.org/francois-cointeraux-the-architect-of-the-agricultural-proletariat>.

24 Drawing Matter, “François Cointeraux: The Architect of the Agricultural Proletariat”, accessed December 22nd, 2024, <https://drawingmatter.org/francois-cointeraux-the-architect-of-the-agricultural-proletariat>.

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spective. According to Barbacci those misconceptions stem from the materials link to poverty and its “scapegoat” status for the destruction of the material through natural disaster in South America. When actually its often improper building that is responsible.²⁵ The material should not only be structurally `good`,` but it must also be perceived and recognized as such to be ascribed the value associated with that specific quality.

Part 3:The Aesthetic Considerations of Building with Rammed Earth

Rauch’s Aesthetic Perception in Rammed Earth:

Rammed Earth is a distinctive building material with a unique finish. The texture’s roughness (see fig. 10) can vary based on the material’s composition. Often, the excavation material from the site (see fig. 9) can be utilised, leading to aesthetic finishes that reflect the local material landscape.²⁶ The liveliness and movement associated with rammed earth contribute to its unique aesthetic qualities.²⁷ Its aesthetic appearance changes slightly over the years until it settles into its final look.²⁸ This unique perspective reflects how Martin Rauch and his supporters understand rammed earth.²⁹

Hassan Fathy and the Village of New Gourn:

Nonetheless, some perspectives interpret the material from an entirely different angle. During his work on the village of New Gourn (see fig. 11) in the mid-1940s, Hassan Fathy encountered the negative perceptions often associated with rammed earth. He effectively constructed the village of New Gourn using mud bricks (see fig. 12) for the residents, who were considered “peasants.” His designs were ultimately destroyed and replaced with more expensive steel and concrete structures. To make matters worse, these new constructions disregarded the local climate and traditions. Even from the beginning, the mud brick buildings were only considered good enough for the peasants to live in. Later, parts of New Gourn were demolished despite being successfully developed to meet the client’s satisfaction within the agreed (very small) budget. In Egypt at the time, using steel and concrete was viewed as a symbol of wealth, which made New Gourn seem inadequate.³⁰

Value Perception of New Gourn:

When considering the value of rammed earth, or mud brick in this instance, and the question of “beautiful to whom?”, it’s evident that a distinction exists



Fig. 9 Gravel from the Old Chapel

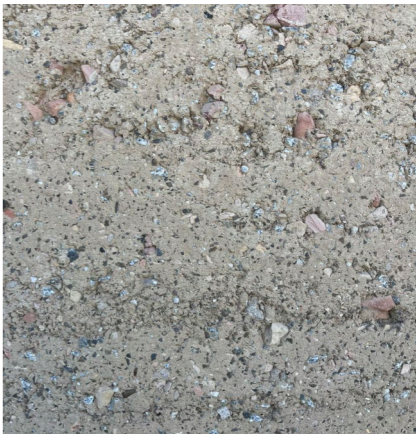


Fig. 10 Rammed Earth Texture



Fig. 11 Village of New Gourn

25 Norma Barbacci. “Earthen Architecture - Valorisation and Underestimation.” International archives of the photogrammetry, remote sensing and spatial information sciences (Santiago, March 22nd to 26th, 2020), p. 4.

26 “LehmTonErde,” LehmTonErde, accessed November 12th, <https://www.lehmtonerde.at/de/lehm/lehm.php?alD=41>

27 Susanna Koeberle, „Roger Boltshauser: Semperpreis 2024,“ Atrium 4, (2024): 34.

28 “LehmTonErde,” LehmTonErde, accessed November 12th, <https://www.lehmtonerde.at/de/lehm/lehm.php?alD=41>

29 “LehmTonErde,” LehmTonErde, accessed November 12th, <https://www.lehmtonerde.at/de/lehm/lehm.php?alD=41>

30 Hassan Fathy, “Architecture for the poor: an experiment in rural Egypt”, (Chicago: University of Chicago Press, 1967). P. 14, 17, 150-164.

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in value perception between Hassan Fathy and the Egyptian government.³¹ From a psychological perspective of value, it appears that the Egyptian Government viewed 'beautiful' as something internationally recognised as worthy, akin to steel and concrete. Potentially following the rise of the international architecture style that started in the 1920s.³² The two parties followed different "motivations as goals to be pursued" behind the project of New Gurna, creating that value imbalance.³³

Hassan Fathy, the architect, worked hands-on at the project site, experiencing the materiality, culture, and people surrounding the project. His goal was to create this village for the so-called 'peasants' with the small means available. This meant using vernacular building techniques such as mud brick construction (see fig. 12), as well as specific spatial layouts for ventilation suited to the local climate. No one from the Ministry of Antiquities even believed that Fathy would be able to deliver this project against all odds, but he did.³⁴ From that, I assume Fathy sees value in this cognitive motivation he pursued and achieved. Contrary to the Ministry of Antiquities, who never pursued this project as they thought it impossible anyway. There were no cognitive representations of motivations regarding New Gurna the way Fathy pursued it, meaning they likely saw no value from the beginning on. Infinitely, meaning they saw no value in the project.

Furthermore, Fathy's project can be ascribed value from the antique principle of truth. True to what is the question? Fathy is a trained architect which one would think speaks against the principle of the vernacular defined as : architecture outside academic standards.³⁵

Vernacular architecture relies on the community. It is constructed by locals for locals and utilises traditional materials and techniques unique to the area. These communities are traditional economies emphasising self-sufficiency through local resources, labour, and consumption patterns. The focus lies on sustaining the immediate community over catering to larger markets. Traditional economies are intricately connected to vernacular architecture practices, utilising local methods that have developed over time and tailored to specific environments and resources. Vernacular architecture draws on cultural traditions, leading to the employment of customary materials and distinct construction techniques.³⁶

Fathy stays true to the vernacular, using local materials and crafts such as mud brick, employing local labour, and attempting to create a place that serves the immediate community. In contrast to Fathy, the Ministry of Antiques, which oversees the project, constructs more costly buildings using steel and concrete. This choice reflects engagement with global economies while overlooking traditional materials and methods. At that time, steel was likely entirely imported, and concrete may have been partly imported to Egypt. Consequently, the Egyptian government favoured global economic support and prestige over utilising mud bricks and hiring local labour to bolster traditional economies.



Fig. 12 Village of New Gurna, Mud Brick making

31 Hassan Fathy, "Architecture for the poor: an experiment in rural Egypt", (Chicago: University of Chicago Press, 1967). P.114

32 Beata Majerska-Paźubicka, "Architecture vs. Globalization," IOP Conference Series: Materials Science and Engineering 960 (2020): 022078, <https://doi.org/10.1088/1757-899X/960/2/022078>.

33 Lilach Sagiv and Shalom H. Schwartz, "Personal Values across Cultures," Annual Review of Psychology 73, 517-46 (2022): p. 519.

34 Hassan Fathy, "Architecture for the poor: an experiment in rural Egypt", (Chicago: University of Chicago Press, 1967). P.?

35 Oxford Reference, s.v. "Vernacular Architecture", accessed December 19, 2024, <https://www.oxfordreference.com/display/10.1093/oi/authority.20110803115517898>.

36 Paul Oliver, "Atlas of Vernacular Architecture", (New York: Rutledge, 2007), p.12.

Part 4: The Rammed Earth of the Chapel of Reconciliation

My Own Experience of the Chapel of Reconciliation:

While spending my summer in Berlin, I visited the Chapel of Reconciliation based on a colleague's suggestion that it was an intriguing place worth seeing. Walking through the former death strip adjacent to Bernauer Straße, numerous tourists, alongside what I presume to be locals, absorb the atmosphere as they pass the "Postweg" and the remaining remnants of the Berlin Wall. The ambience is tense and melancholic yet simultaneously calm and tranquil. Aside from the chapel, this expansive, unoccupied strip remains undeveloped, a scar encircled by the vibrant and bustling city of Berlin.

As I entered the chapel through the "Wandelgang"(see fig. 13 and 14), I moved from the scarred land of the former Death Strip into the sacred inner space, surrounded by sturdy rammed earth walls. The wooden lamella allowed natural light to filter through; it remained bright in the "Wandelgang", yet it felt more serene and removed from the outside world. To access the chapel's interior(see fig. 15), you follow the oval path of the "Wandelgang" halfway around to the far side, leading to the entrance of the rammed earth wall. It resembles navigating a short maze, leaving you uncertain of your direction. The entrance to the inner oval space isn't visible from the outside, and as you pass through the "Wandelgang, you are transported away from your surroundings into this secluded sacred area.

The solid rammed earth walls form a protective yet substantial layer. The incorporation of gravel from the old Church of Reconciliation lends a distinctive texture. Unable to resist, I reached out to feel the walls, eager to experience this unique surface. From a distance, the walls could easily be mistaken for concrete, but up close, their texture distinguishes them as something entirely different. As I approached the chapel, I was already aware it was constructed from rammed earth. I do wonder, though, if I would have recognized it as such without prior knowledge.

The Construction Process:

Rammed earth was not an obvious material choice for constructing the chapel; the architects originally proposed a glass and steel construction. The proposed building materials heavily reminded the community of the despised former wall. At last, the municipality proposed clay and wood as possible building materials. The decision to build with clay carries a deeper meaning. Clay is a lively, moving material that is sensitive towards its environment. The material interacts with the surrounding climate to maintain temperature.³⁷ It exhibits more fragility than contemporary building materials like steel and concrete. In the 20th century, the municipality has repeatedly been confronted with its fragility; above all, its lives have been threatened, and the fragility of the building material represents the vulnerability of life. Furthermore, clay is a logical choice due to the location being close to an old clay pit. In the region of Berlin, clay is traditionally used as a red or

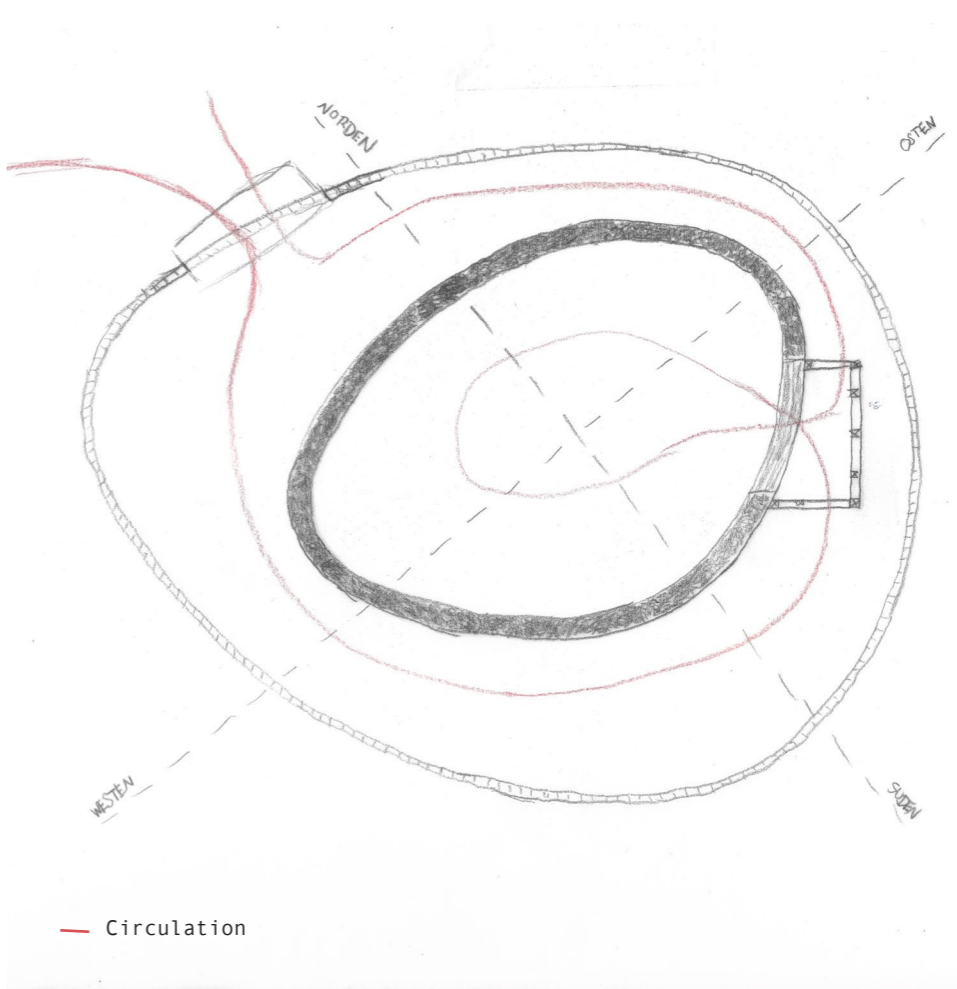


Fig. 13 Chapel of Reconciliation Circulation Diagram



Fig. 14 Wandelgang

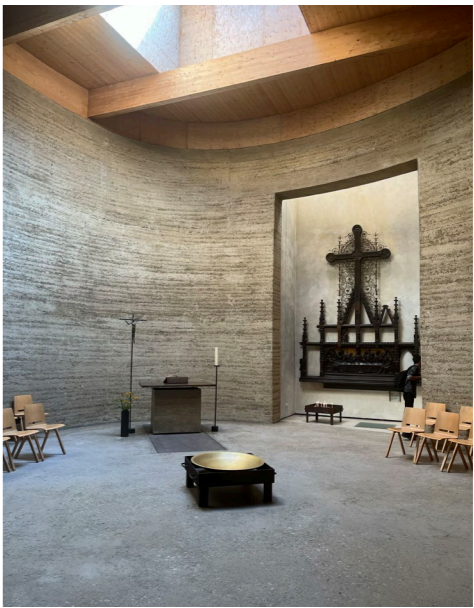


Fig. 15 Interior of the Chapel

³⁷ Paraphrased translation from: Dr. Petra Bahr, "Die Kapelle der Versöhnung", 1st Edition (Allgäu: Kunstverlag Josef Fink, 2008), p. 31-35

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yellow brick.³⁸

Traditionally, clay is also used as a healing substance. Therefore, a clay construction promises recovery but acknowledges the past trauma. Additionally, the material is ecological, setting an example for the future of responsible construction. Aligned with the municipality's financial means, the chapel works without heating due to its excellent thermal performance, saving on energy bills.³⁹

Before on-site construction could commence, the material composition needed to be established. Northeast of Berlin, in Herzfeld, an appropriate clay pit with the necessary characteristics and infrastructure was located. In large compulsory mixers, various clay compositions were evaluated. The clay, when combined with brick chippings, crushed sand, and granite gravel, showcased a range of compositions. Certain mixtures incorporated flax fibres, which enhanced both compressive strength and transverse reinforcement. The debris mixed with the clay comes from the old Church of Reconciliation. Martin Rauch and his team constructed trial rammed earth walls in "Herzfelde", which were then tested under laboratory conditions in collaboration with the Technical University of Berlin. The actual rammed earth body for the Chapel was produced on-site (see fig.17), compressing the clay composition layers of 15 to 20 centimetres through mechanical trench compactors (see fig.16) in the temporary wooden framework.⁴⁰

Water content was limited to 8 % of the dry mass. For the aggregate, a favourable grading curve was considered, similar to concrete, to ensure adequate compaction. A particle size varying from 0 to 5 mm was used.⁴¹

The structure fulfils more than structural purposes. It also carries symbolic value, encasing leftovers of the former Church of Reconciliation.⁴²

Goodness, Beauty and Truth in the Rammed Earth of Chapel of

Reconciliation:

The Chapel of Reconciliation illustrates how Martin Rauch changes perceptions of rammed earth. He elevates it from being labeled a 'primitive' material to one carrying significant symbolic and functional value. By integrating fragments from the destroyed Church of Reconciliation into the rammed earth walls, Rauch highlights two valorization processes: 'Aufwertung' (value enhancement) and 'Verwertung' (waste processing). This perspective portrays rammed earth as both structurally 'good' and symbolically significant.

The chapel demonstrates the positive attributes of rammed earth, particularly its excellent thermal and acoustic properties.⁴³ The material regulates



Fig. 16 Compression through mechanical trench Compactors



Fig. 17 Chapel of Reconciliation On Site Construction

38 Paraphrased translation from: Dr. Petra Bahr, "Die Kapelle der Versöhnung", 1st Edition (Allgäu: Kunstverlag Josef Fink, 2008), p. 31-35

39 Paraphrased translation from: Dr. Petra Bahr, "Die Kapelle der Versöhnung", 1st Edition (Allgäu: Kunstverlag Josef Fink, 2008), p. 31 - 35.

40 Paraphrased translation from: Andreas Schulz, "Die Kapelle der Versöhnung in der Bernauer Straße in Berlin Mitte - Ein Konstruktionsbericht". Berlin: Ernst und Sohn Verlag für Architektur und technische Wissenschaften, 2001, p. 3-4.

41 Paraphrased translation from: Dr. Petra Bahr, „Die Kapelle der Versöhnung“, 1st Edition (Allgäu: Kunstverlag Josef Fink, 2008), p. 31 - 35.

42 Paraphrased translation from: Andreas Schulz, "Die Kapelle der Versöhnung in der Bernauer Straße in Berlin Mitte - Ein Konstruktionsbericht". Berlin: Ernst und Sohn Verlag für Architektur und technische Wissenschaften, 2001, p. 3-4.

43 Paraphrased translation from: Dr. Petra Bahr, "Die Kapelle der Versöhnung", 1st Edition (Allgäu: Kunstverlag Josef Fink, 2008), p. 31-35

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temperature and sound within the sacred space, creating an environment that is both sustainable and spiritually uplifting. Those qualities add to the concept of a boundary between the history of the exterior environment and the sacred interior space.

Rauch employs a unique erosion technique, where the upper layers gradually reveal coarser textures, emphasising the material's dynamic quality while reinforcing its symbolic links to healing and renewal.⁴⁴

The chapel's design, as well as the process of the community-involved building, embodies values of 'truth' and 'beauty' associated with rammed earth. The walls, crafted from local materials and historical remnants (see fig. 18), emphasise a commitment to the 'true' and its genuine roots in vernacular architecture. This sense of authenticity resonates with classical ideas of 'truth', illustrating the material's connections to its geographical and historical context. The visual character of the rammed earth walls, marked by layered textures and natural erosion patterns, challenges traditional, contemporary aesthetics by celebrating what could be considered imperfections and the transient quality of time, showcasing a 'beauty' often overlooked in modern materials.

Economic Value of Rammed Earth:

Returning to the concept of value and the context established by Martin Rauch, it's essential to examine the economic aspect of value here. Rauch primarily operates in Europe, a Western society characterised by a corporate context.⁴⁵ Opposite to the vernacular, he extends his focus beyond just the sustenance of the immediate community. Ultimately, he runs a business that must generate profit. Typically, a company viewed as more profitable is also seen as more successful by Western corporate standards.

Revisiting a fixed form of value that defines the economic site of it as "worth or quality as measured by a standard of equivalence. The material or monetary worth of something; the amount at which something may be estimated in terms of a medium of exchange, as money or goods or some other similar standard."⁴⁶ The monetary value mentioned by the Oxford Dictionary can be determined by the supply and demand principle.

When the supply/demand principle is applied to clay (rammed earth), the material is abundant and readily available, resulting in a high supply. On the other hand, there is low demand due to its reputation as primitive and unfit construction material.⁴⁷ In this context, raw, unprocessed material may be considered low value.

However, for the Chapel of Reconciliation, the unprocessed materials hold both historical and symbolic significance due to the remnants of the destroyed old chapel being used. After processing and shaping, it can be ascribed even more value when assuming its purpose as a sacred but also protective space for the people.⁴⁸ The material is in a symbiotic relationship with its purpose. Clay



Fig. 18 Historical Remnants from the Old Chapel of Reconciliation

⁴⁴ Paraphrased translation from: Dr. Petra Bahr, "Die Kapelle der Versöhnung", 1st Edition (Allgäu: Kunstverlag Josef Fink, 2008), p. 31-35

⁴⁵ „LehmTonErde,“ accessed December 20th, 2024, <https://www.lehmtonerde.at/de/>.

⁴⁶ Oxford English Dictionary, s.v. "value (n.)," June 2024, <https://doi.org/10.1093/OED/5277092424>.

⁴⁷ Norma Barbacci. „Earthen Architecture - Valorisation and Underestimation.“International archives of the photogrammetry, remote sensing and spatial information sciences" (Santiago, March 22nd to 26th, 2020), p. 2.

⁴⁸ Paraphrased translation from: Dr. Petra Bahr, "Die Kapelle der Versöhnung", 1st Edition (Allgäu: Kunstverlag Josef Fink, 2008), p. 31-35

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as the healing and spiritual element of the composition.

Martin Rauch's clay compositions, made with the rammed earth technique, require substantial labour, which tends to be costly in urban Western areas. The change of plasticity and shape, as well as the carefully chosen and scientifically tested composition of earthen materials in the rammed earth walls, add to the value of the finished product. When combined with labour, the equation for a low-value material—which accounts for time and skills—ultimately requires money in Western economies. This means the finished rammed earth product, as long as it exists in this form and purpose, holds value in the form of skill and time.

However building rammed earth walls can be quite cost-effective with voluntary community involvement, as shown in the Chapel of Reconciliation where Rauch build the rammed earth body during a period of three month with voluntary helpers, which relates to the vernacular in building to only sustain the immediate without gaining anything further.⁴⁹ Once more, when considering “true to what?”, that aspect of the construction can be regarded as ‘true’ to the intent of the vernacular. The primary goal of the chapel is to benefit the community, although I suspect that serving the community was not the sole motivation for Martin Rauch in undertaking this project. He was likely compensated for his efforts, which speaks against being ‘true’ to the vernacular. Furthermore, Martin Rauch's projects hold economic value through specific qualities that have demands in niche markets but only limited supply.

Why do people want rammed earth? Rammed Earth, more specifically Rauch's work, follows a unique aesthetic approach that is characterized by textures and materiality unique to specific sites and landscapes and the beauty of the natural and sculptural, making it sought after in architectural circles. Even though it's not the main advertising point, its sustainable qualities can be ascribed value. Furthermore, rammed earth is sought after for its craftsmanship and local identity.⁵⁰ Those qualities make it appealing to clients for bespoke and environmentally conscious designs, creating a good amount of demand for a niche product.

On the supply site, the Chapel of Reconciliation was still produced semi-mechanically, needing a substantial amount of costly human workforce. In those days, Rauch was limited in his supply through a costly workforce and limited scalability. That resulted in positioning as a more luxurious high-end market product emphasising the cultural value of craft.

Rammed Earth and Automation:

His work has evolved since, now using a civil-engineered machine called “Roberta” (see fig.19) a modular and expanding mould that compresses the material. The rammed earth elements can be fully pre-fabricated and assembled on-site (see fig. 20), allowing for larger-scale projects.⁵¹ Together with Herzog and De Meuron Rauch created one of Ricola's Herb Centres for the processing of herbs. Roberta was specifically designed for this 111-meter-long project to enable a



Fig. 19 Roberta, Automatic Adjustable Mold



Fig. 20 On Site Assembling

49 Paul Oliver, “Atlas of Vernacular Architecture”, (New York: Rutledge, 2007), p.12.

50 „LehmTonErde,“ accessed December 25th, 2024, <https://www.lehmtonerde.at/de/>.

51 Marko Sauer, “Retrospective: Martin Rauch,” The Architectural Review, February 2020, accessed December 22, 2024, <https://www.architectural-review.com/buildings/earth/retrospective-martin-rauch>.

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swift construction process. 666 stackable rammed earth blocks were assembled in only five month time, making it a sort of automatic mass production.⁵²

The development towards large-scale automated rammed earth construction has significant implications for the supply-demand scheme and the value perception of rammed earth. It makes the product more available to a broader market due to likely lower production costs.

Even if automation is able to maintain the unique aesthetic of rammed earth, it might be perceived as less 'beautiful' in value by high-end or niche clients because part of the value in 'beauty' derives from the process of craft that is marked through its time intensity and coastlines but most importantly the unique material composition. If projects are all pre-fabricated in the same place, they might not use local excavation materials from project sites, as done with the Chapel of Reconciliation, losing the uniqueness appeal.

Furthermore, this process develops away from the 'true' origin of the vernacular. Before, there were more connections in the 'true' left, specifically the Chapel of Reconciliation and its community-building effort.

⁵² Marko Sauer, "Retrospective: Martin Rauch," *The Architectural Review*, February 2020, accessed December 22, 2024, <https://www.architectural-review.com/buildings/earth/retrospective-martin-rauch>.

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Conclusion:

This essay examined Martin Rauch's role in the valorisation of rammed earth, exploring the concept of value through his best-known work, the Chapel of Reconciliation.

In contrast to Rauch, the two cases of Fathy and Cointeraux, which were unsuccessful in valorising rammed earth (or mud brick), fundamentally grounded their work in the vernacular's 'truth'. This indicates that the vernacular was not effective as a basis for validity in their socio-cultural context.

Today, Martin Rauch builds with rammed earth in a contemporary Western context. Even more importantly, in this context, as Norma Barbacci establishes, rammed earth – a material often deemed primitive and underestimated – requires sufficient appropriate values ascribed to achieve validity in its socio-cultural context.

In terms of objectively possessing certain qualities, having value isn't enough. The value needs to be perceived and recognised as such to be effective. In doing so, value can be 'ascribed'.

From the essay's examples, it becomes clear that context is a major factor in value perception. Different socio-cultural contexts (from Fathy to Cointeraux and Rauch) require different value constellations to be fulfilled for something to be recognised as 'valid', having its reason of purpose.

The Chapel of Reconciliation has shown Rauch's ability to valorise rammed earth by doing 'Aufwerten' in English, 'enhancing value' in the socio-cultural and site-specific contexts.

Contrary to the other example cases, Rauch focuses on more than the 'truth'. In the Chapel's rammed Earth, he creates a narrative of 'goodness' (structurally good) and 'beauty' (aesthetically unique) and site-specific symbolism connecting to the material, creating effective 'validity' in the Chapel of Reconciliations context.

The main value that differentiates Rauch in his work from Cointeraux and Fathy is the 'beauty' of the material that comes from Rauch's own 'truth' of being a sculptor and kiln builder working hands-on with material, appreciating its qualities and enhancing them through his own perspective. The Chapel of Reconciliation showed he 'valorises' the material as an artist embracing the craft, creating a narrative of exclusivity with a high monetary value product.

As Rauch advances towards automation, the question emerges: can the profound connection between hand and material survive the cold precision of the machine? Or does the quest for efficiency come at the expense of losing the very essence of the craft that made his work so uniquely valuable?

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