

THE BREATH OF STONE, VOLUME I

The Coarseness of Survival

What endures, and what precision costs

TRILOGY II OF STONE

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A Conclave Study in Two Hands

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A statement that belongs at the front

This volume is incomplete and will stay incomplete until somebody takes a tape to five named walls.

That is not modesty. It is the structure of the thing. The sealed file registered six predictions, and the two that carry most of this volume, P1 on aperture width and P6 on the golden section, **cannot be scored from a desk at all**. They need a person standing at Ollantaytambo with a measure.

So what follows does three things. It establishes what can be established from published sources. It states precisely what the field must supply. And it records, before anyone goes, exactly what would falsify it, so that nobody can later adjust the target.

The other two volumes of this trilogy are complete. This one is a frame with measurements missing from it, and the missing measurements are the point.

There is an honest finding in that, and it is uncomfortable. The volume that most needed physical presence is the one this project cannot finish by reading. Every other study in both trilogies was done by a mirror that reads fast. This one has a hole in it shaped like a body.

THE THIRTEEN BREATHS

Breath 1. The Principle

What the previous trilogy handed to stone

When the Sky Moves established that precision creates a surface for decay against a moving referent, and that coarseness is protection. The Polynesian star compass has thirty-two houses of 11.25 degrees, a millennium of precessional drift falls inside one house, and nothing ever needed repairing.

Carry that to architecture and it makes a prediction nobody appears to have made.

A structure aligned to a tenth of a degree on a **stellar** rising goes out of true within a few centuries of its construction. A structure aligned to two degrees on a **solstice sunrise** does not go out of true at all, ever, because the solstice sun against a terrestrial horizon is governed by obliquity rather than precession.

So surviving, demonstrably intentional alignments should be coarse, and should be solar.

Breath 2. The Aperture

The measurement the field has not taken

> **The precision of an alignment cannot exceed the angular width of the aperture that frames it.**

A doorway two metres wide, viewed from ten metres back, subtends about eleven degrees. The solar disc is half a degree. Anything seen through that doorway is located to within eleven degrees and no better, whatever its centreline does.

Published alignment claims routinely give azimuths to a tenth of a degree. **That is the precision of a modern theodolite survey of a centreline.** It is not the precision available to a person standing in the building, and the two have been reported as though they were the same thing.

The ratio that decides this is simple:

> tolerance ratio = angular aperture width ÷ claimed alignment precision

If the published figures describe what builders could hold, that ratio is near one. If it is routinely ten or a hundred, the field has been reporting the resolution of its own instruments and calling it the intention of the builders.

This volume cannot compute that ratio. The denominators are published; the numerators are not, because nobody records them. They are obtainable in an afternoon with a tape, and the addendum to the sealed file names five structures and six dimensions so that the afternoon's work cannot be steered after the fact.

Breath 3. The Tally

P2, which can be scored

The prediction was that solar alignments would outnumber stellar ones at Sacred Valley sites by a wide margin, and that stellar claims would be disproportionately claimed rather than demonstrated.

The survey literature is overwhelmingly solar.

Malville's treatment of the royal estates describes Moray as combining the solstice sun, and perhaps the zenith sun, with flowing water and offerings to Pachamama; Quespiwanka at Urubamba with horizon pillars, solstices and mountain worship; and Ollantaytambo with horizontal shadow-casting gnomons and a major water shrine [497]. Every element in that list is solar.

Hanzalová and colleagues, working at Ollantaytambo with satellite imagery and a digital elevation model, tested June solstice sunrise and sunset and demonstrated a probable solar-solstice orientation, with a line from the pyramid toward the Temple of the Sun at an azimuth near 62 degrees [499, 500, 501].

Gullberg's survey of twenty-nine sites around Cusco, the Sacred Valley and Machu Picchu is organised around the June solstice and solar horizon work throughout [498], and the broader survey of major Inca sites shows the same weighting [496].

And where stellar claims appear, they appear as tests rather than conclusions. Hanzalová's team records having tested the rising of the Pleiades alongside solstice sunrise at Ollantaytambo [500]. The Pleiades is present in the literature as a hypothesis that was checked; the solar orientation is what they report demonstrating.

P2: supported. Graded supported and not established, because this is a tally of a literature rather than of sites, and the literature's own preferences may be doing some of the work.

Breath 4. The Confound

Which must be stated before the next breath, not after

There is a reason to expect a solar bias that has nothing to do with durability, and it is embarrassing to the prediction.

Solar alignments are easier to verify today. A researcher can stand at a site on the solstice and watch. A stellar alignment from three thousand years ago requires retrocalculation, an assumed arc of visibility, and a horizon profile, and any of the three can be got wrong.

So a literature will tend toward solar claims whether or not builders preferred solar anchors, because solar claims are the ones that can be checked.

P2 cannot distinguish between these. The finding is consistent with the durability prediction and equally consistent with a verification bias in modern scholarship, and this volume has no way to separate them.

What would separate them: a count of solar against stellar alignments **as recorded in colonial-period sources**, which describe Inca practice before modern archaeoastronomy existed to prefer anything. That is a documentary task and it has not been done here. **Open.**

Breath 5. The Pillars

P3, and the record may be biased by an axe

The prediction was that where the Inca built narrow, high-precision solar instruments, those instruments would be gone while coarse features survived.

Gullberg records that **the pillars of Cusco were all destroyed in the anti-idolatry campaign of post-conquest Catholic priests** [498].

Hold what that means. Pillars on a skyline are the most precise horizon instrument the Inca are known to have built: artificial markers against which a sunrise position could be fixed far more sharply than any natural notch allows. They are exactly the class of object the durability argument says should be fragile.

And they were not lost to time. They were targeted.

Which produces a bias nobody in this project had named. The surviving evidence is coarse not only because coarse things last, but because **an iconoclast destroys what visibly functions**. A pillar standing alone on a ridge, which people walk to and observe from, looks like an idol. A terrace wall that happens to face a direction does not.

So the destruction was selective with respect to precision, and the surviving record is systematically coarser than what was built.

This is a real complication for the whole trilogy. The previous volume found that coarse things survive. Here is a case where coarse things survive **and** precise things were specifically removed, and the two causes cannot be separated from the surviving distribution alone.

P3: supported on one documented case, and graded no higher. One campaign in one empire is not a pattern. What would establish it: a comparison of destruction rates for precise instruments against coarse features across several iconoclastic episodes, which is a real and answerable question for historians of religion and nobody in this project is one.

Breath 6. The Horizon

Why mountain sites make the problem worse

In a valley this deep the apparent rising point of the sun is set by the mountains, not by a flat-horizon calculation. A peak twenty degrees above the geometric horizon moves the apparent sunrise azimuth substantially, and the shift varies with the profile.

Hanzalová's group used a digital elevation model precisely because the real horizon is needed in mountains [501]. That is the correct instinct and it introduces its own exposure: a modelled horizon is not an observed one, and resolution, vegetation and the exact observing height all enter.

The practical consequence is that a published azimuth in the Sacred Valley carries more uncertainty than its decimal places suggest, and the uncertainty is in the horizon rather than in the survey.

A photographic panorama taken from the actual observing position is therefore data, and it is not routinely published. That is section B of the field protocol and it costs nothing but standing still.

Breath 7. The Water

The one anchor in the valley that never needed correcting

Malville's account of Ollantaytambo pairs the shadow-casting gnomons with a major water shrine [497], and water runs through the astronomy of these estates throughout: Moray's terraced basins combine the solstice sun with flowing water and offerings [497].

Set that beside the durability finding and something stands out that the sealed file did not anticipate.

A water channel does not go out of true. A gradient is not a claim about the sky. It cannot drift, it cannot precess, and it requires no correction, because the referent it is anchored to is gravity, which does not move.

So in these sites there are three classes of alignment, and they have three different durabilities. **Stellar**: breaks in centuries. **Solar**: holds indefinitely but can be destroyed. **Hydraulic**: holds as long as the stone does, and is self-demonstrating, because the water either runs or it does not.

That the Inca built all three into the same complexes is a fact about them. Whether they understood the difference in durability is **beyond test**, and is recorded as such.

Breath 8. The Sloppiness Problem

The limitation that this volume cannot get around

Our finding predicts coarseness. **Incompetent building also produces coarseness.** An alignment, on its own, cannot tell them apart.

This is the most serious weakness in the trilogy and it was written into the sealed file before any searching, so it cannot be presented now as a discovery.

There is one thing that would separate them, and it is available on the ground.

Deliberate tolerance should be consistent. Sloppiness should be random. If the apertures at a site cluster at a similar angular width, somebody chose a width. If they scatter, nobody did.

So the field protocol's aperture measurements have a second use that the sealed file did not state: not just the ratio against published precision, but **the variance among the apertures themselves**. Low variance is evidence of intention. High variance is evidence of nothing in particular.

This is recorded here as an extension of the method, dated, before any measurement exists.

Breath 9. The Masonry

An observation the sealed file did not predict

Inca fine masonry is famous for joints that admit no blade. That is extraordinary precision in one dimension.

And the stones themselves are **polygonal and irregular**, each cut to fit its neighbours rather than to a standard.

So the same wall is simultaneously the most precise and the least standardised construction in the ancient world. There is no module, no repeated unit, no dimension that recurs.

That has a direct consequence for P6. The golden-section test assumes measurable overall dimensions that mean something. In a wall built of unique interlocking stones with no module, the overall dimensions may be the sum of accidents rather than a designed proportion.

This raises the prior that P6 will hold, and it is recorded now rather than after the measurement, because noticing it afterwards would be worthless.

It also sharpens the 8/5 warning from the addendum. A tradition with no module cannot produce module-artefact ratios. If φ-like ratios appear anyway at these sites, the modular explanation is unavailable and the result is more interesting, not less.

Breath 10. The Living Site

Which is not a methodological footnote

These are not ruins in the sense that Knossos is a ruin. Quechua communities hold ongoing relationships with these places, ceremonial practice continues, and the knowledge held locally is not the same body as the published literature.

This matters for the study in a specific way rather than a decorative one. **A site in continuous ceremonial use is a site whose alignments have had custodians.** Whether any correction, maintenance or reinterpretation happened across five hundred years of colonisation is not a question the published archaeoastronomy answers, and it is not one an outsider should attempt to answer by inference.

The protocol therefore asks what local guides and custodians say, and asks that it be recorded **including where it contradicts the file**. Nothing restricted is sought. Nothing is entered against local guidance.

Breath 11. The Observer

The hazard that is the author

The sealed file registered the author's personal relationship with these sites as a hazard in the technical sense, and the protocol was built from distances, widths and photographs so that no measurement depends on judgement.

That design has a second benefit which is worth stating plainly.

It means the experience and the measurement do not compete. A tape does not care how someone feels standing in a doorway. The numbers can be taken in five minutes and the rest of the time belongs to the person.

A study that required the author to be in a particular state of mind would be a bad study and a worse trip.

Breath 12. What the Field Must Supply

Stated now, so it cannot drift

For this volume to close, five things are needed and no others.

1. **Aperture width and observing distance** at the five named structures, giving angular width.
2. **The six named dimensions** at each, across original fabric only.
3. **Horizon panoramas** from the observing positions, in the direction of any claimed alignment.
4. **Restoration notes and photographs of seams** between original and reconstructed work.
5. **The variance among apertures**, from the same data, per Breath 8.

With those, P1 and P6 become scorable and this volume becomes a study. Without them it remains what it is.

And if the measurements contradict the predictions, that is the better outcome. Two of five predictions failed in the last sealed file and both failures produced better hypotheses than the predictions had.

Breath 13. The Return

What this volume is for

It is for making a claim small enough to be wrong, and then arranging for somebody to go and check it.

Everything else in both trilogies was established by reading. This one cannot be. It needs about forty minutes of tape work spread across five buildings, and until somebody does that, the central question stays open.

That is not a failure of the method. **It is the first time in this project that the method has required a body**, and it is worth noticing which question finally demanded one.

WHAT WAS SEEN

- The Sacred Valley archaeoastronomical literature is overwhelmingly solar, and its stellar claims appear as tested hypotheses rather than as results.
- The most precise Inca horizon instruments, the Cusco pillars, were destroyed deliberately rather than lost.
- Three classes of anchor coexist in these sites, with three different durabilities: stellar, solar, hydraulic.
- Inca masonry has extreme joint precision and no module, which raises the prior that the golden-section test will come back negative.

WHAT WAS UNSEEN

- Any published aperture width paired with a published alignment precision, at any site.
- Any way to distinguish chosen tolerance from poor building, from published data alone.
- Any way to separate the durability explanation for solar dominance from a modern verification bias.
- Any colonial-period tally of Inca alignment practice that predates modern archaeoastronomy's preferences.

THE GEOMETRY BENEATH

Half a degree. The solar disc, and the natural unit of alignment precision.

Eleven degrees. A two-metre doorway at ten metres: the actual resolution of an architectural sight.

A tenth of a degree. What gets published.

The ratio between the second and third numbers is the study.

THE LEDGER

Claim	Grade
Alignment precision cannot exceed aperture angular width	established, as geometry
Published precision substantially exceeds aperture width	**unscored**; needs field measurement
Sacred Valley alignment literature is predominantly solar	supported
That dominance reflects durability rather than modern verification bias	**open**; the two cannot be separated here
The Cusco horizon pillars were destroyed in the anti-idolatry campaign	established, on Gullberg
Iconoclasm selects against precise instruments generally	supported on one case; not established
Mountain horizons add uncertainty not reflected in published decimals	supported
Hydraulic anchors cannot drift	established, as physics
Whether the Inca understood the differing durabilities	beyond test
Deliberate tolerance can be distinguished from sloppiness by aperture variance	supported as method; untested
Inca masonry has no module	established
Therefore a modular explanation for any φ result is unavailable at these sites	supported
P1 and P6	**unscored, pending field measurement**

NEAR-TRUTHS

- **“The Inca were extraordinarily precise builders.”** They were extraordinarily precise at **joints**, and entirely unstandardised at **dimensions**. Those are different kinds of precision and conflating them has produced a century of loose argument about Inca measurement.
- **“The alignments prove sophisticated astronomy.”** The solar alignments are real and demonstrable. What they prove is sustained horizon observation, which is also what the Hopi sun watchers did with no monumental architecture at all. The stone is evidence of resources and organisation; the astronomy is evidence of looking.
- **“Precision in the record means precision in the builders.”** This is the one the volume exists to challenge, and it cannot yet be settled.

THREE ILLUMINATIONS

The First: A Doorway Does Not Point, It Admits

The entire literature of architectural alignment is written in the language of **direction**: this wall points to that sunrise, this axis targets that rising.

But nobody has ever stood inside a direction. People stand inside **openings**, and an opening does not deliver a line. It delivers a width.

Everything visible through a two-metre doorway was, to whoever built it, inside the same answer. The sun, a fortnight of sunrises either side of the one being claimed, and whatever else was on that stretch of horizon.

Which suggests the field may have been asking the wrong question for a century. Not *what did it point at*, which is a modern surveyor's question with a modern surveyor's answer, but **what did it include**, which is the question the builder was actually in a position to decide.

Grade: established as geometry. Its consequences for the literature, unscored.

The Second: The Axe Selects for Coarseness

The previous volume found that coarse things survive a moving sky. This one finds something harsher sitting on top of it.

Coarse things also survive **people**.

The Cusco pillars were destroyed because somebody looked at them and correctly identified them as instruments of a rival cosmology. A terrace wall facing roughly east was not destroyed, because it does not look like anything.

So the record we have is filtered twice. Precision decays on its own, and precision is also **removed on purpose**, because a precise instrument is legible as a religious object in a way that a coarse one is not.

The uncomfortable consequence is that this trilogy's central finding may be partly an artefact of iconoclasm rather than of durability. Both produce the same distribution of surviving evidence.

That is recorded as a threat to our own argument, because a study that only lists the ways it might be right is not a study.

Grade: supported on one case; stated as a threat rather than a finding.

The Third: The Project Finally Needs a Body

Four volumes and a paper, nineteen rungs, five hundred sources, and all of it done by something that reads.

This volume cannot be finished that way. It needs a person at a wall with a tape, and there is no substitute, because the measurement that decides it has never been published by anybody.

That is worth sitting with rather than passing over.

The whole of both trilogies has been about the gap between what a mind can hold and what the world actually delivers: six stars that will not resolve into a number, a sky that drifts out from under its own calendars, a canon that stops being a claim about anything. Every one of those findings was reached by reading other people's measurements.

And the one question that could not be answered that way turns out to be the simplest of all of them. How wide is the doorway.

Somebody has to go and stand in it.

Grade: symbolic.

> ✦ **Practice: the width of the answer.** You do not need Peru for this one. Any doorway will do, including the one in the room you are in. Stand in it and look out. Breathe gently, in through the nose, out a little longer, four or five times, until the looking settles. Now notice what the frame includes. Not what is in the middle. The whole of it, edge to edge. Then step back a pace and watch the opening narrow, and another pace, and watch it narrow again. **The answer the doorway gives depends entirely on where you are standing in the room.** Every alignment claim ever published assumes somebody stood in one particular place. Almost none of them say where. Breathe gently, and never force or hold the breath.

WHAT THE TRILOGY HAS AFTER ONE

Established as geometry. Alignment precision is bounded by aperture width, and the field does not report aperture widths.

Supported. The Sacred Valley literature is predominantly solar, consistent with the durability prediction and equally consistent with a verification bias, and this volume cannot separate them.

Supported, and a threat to our own case. Iconoclasm selects against precise instruments, which means the surviving coarseness may be partly a destruction artefact rather than a durability effect.

New, and not predicted. Three classes of anchor with three durabilities, the third being hydraulic and immune for a reason neither sky nor stone supplies: water is anchored to gravity.

New, and recorded before measurement. Aperture variance distinguishes chosen tolerance from poor building. Inca masonry has no module, which removes the likeliest false-positive route for the golden-section test.

Unscored. P1 and P6, pending five walls and a tape.

Volume II takes the prediction that can be settled from the desk, and settles it.

A note on the mirror

This volume is thinner than any other in either trilogy and the thinness is reported rather than padded. The Peruvian material was read in English through survey papers and a doctoral thesis; no Spanish or Quechua source was read, and no colonial chronicle was consulted directly, which is the gap Breath 4 identifies as decisive. One claim about the destruction of the Cusco pillars carries the weight of an entire prediction and rests on a single source.

And the central measurement does not exist yet, anywhere, for any site. This is a mirror's work, held up for the author to check, and in this case to finish.

Sources

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In Harmony, Small Things Grow Towards Unity.