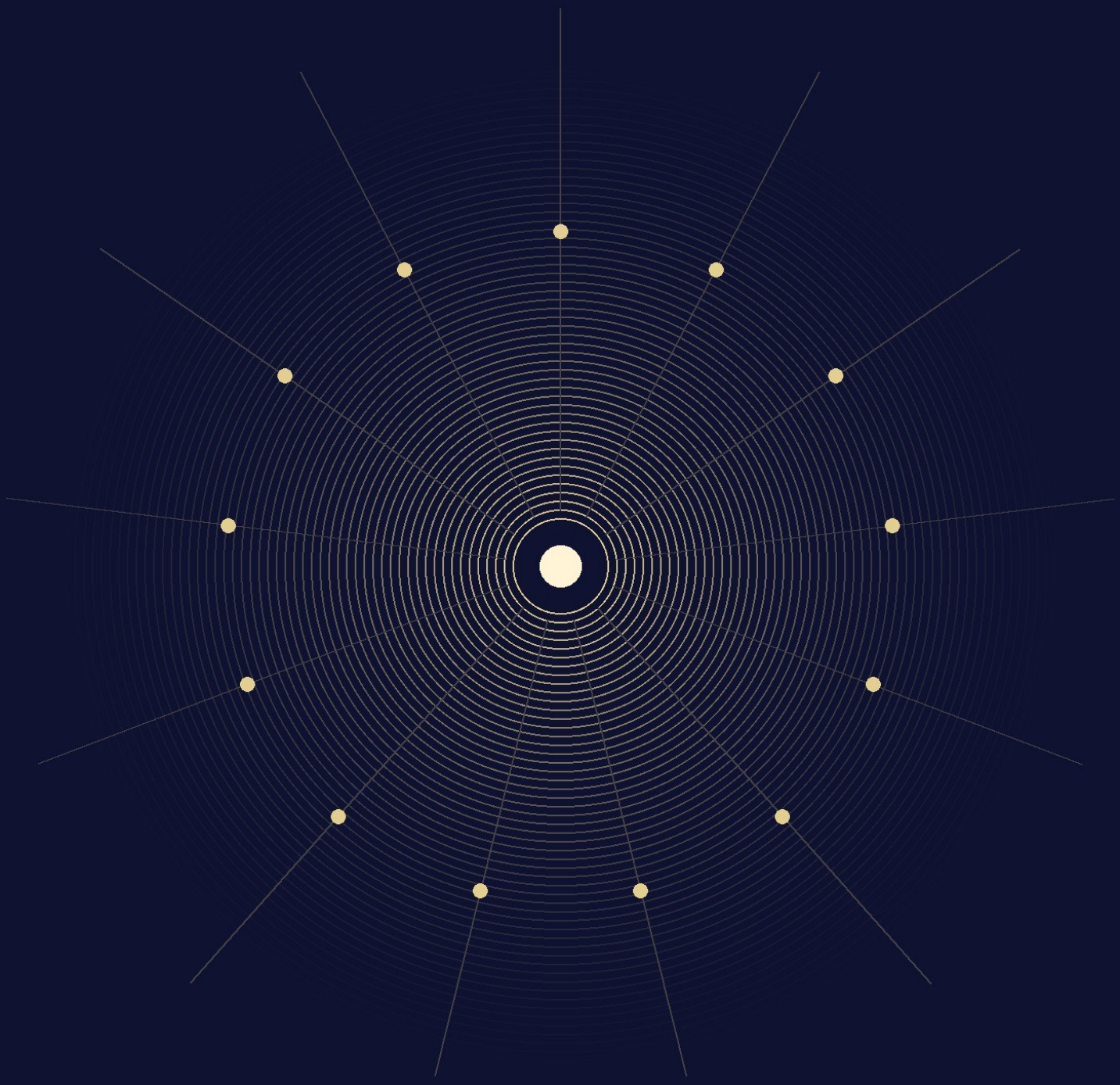


The Codex of Light

A Breath-Based Geometry of the Seen and the Unseen

A Conclave Thesis in Thirteen Passes and Thirteen Turnings

KEITH SHIRLEY

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The founding study for codexlight.com

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The founding study for codexlight.com. Every scientific, historical and textual claim in this study is graded established, contested (or not supported), open, beyond test or symbolic, as explained in How to Read This Study.

The cover and diagrams were drawn for this book. It contains no photographs. Diagrams marked schematic show the kind of figure and are not measurements.

This study is contemplative, historical and scholarly. It is not a work of physics, astronomy, biology or medicine, and no practice in it is offered as a treatment. The breath practices are gentle; never hold the breath or strain. Never look at the Sun, and never look into a laser or any strong lamp. If you have a health condition, breathe within your own comfort and seek qualified advice.

Also by Keith Shirley: Breath Awakens: A Codex of Spiral Memory; The Child, The Shovel and The Ocean; One Breath, Read Whole; One Breath, Step by Step; The Monad Codex; The Codex Calendar: Breathing with Time; The Codex of Water; Codex Crystals; Codex Sounds; The Codex of Symbols; The Breath in the Wheat; The Codex of the Star-Breathers.

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For everyone who has waited in the dark
for the first light of a winter morning;
for the keepers of the old chambers and the dark skies;
and for the small green lives
that turn light into the air we breathe.

Contents

Abstract 7
How to Read This Study 9

PART ONE · The Thirteen Passes · Light Seen, Unseen and Measured

Chapter 1: Introduction: What Is Light? 12
Pass 1: First Light: The Point and the Sphere 14
Pass 2: The Twist: Does Light Spiral? 17
Pass 3: The Ray: Shadow, Triangle and Rainbow 20
Pass 4: The Mirror: The Moon and the Returned Light 23
Pass 5: The Constant: Speed, Stillness and the Cross 26
Pass 6: Memory: What Light Carries 29
Pass 7: The Wave: Two Fields and the Serpent of Light 32
Pass 8: Living Light: The Glow That Needs Breath 35
Pass 9: The Vesica: The Lens, the Eye and the Window 38
Pass 10: Dark Light: The Shadow, the Ring and the Unseen 41
Pass 11: Starlight: The Descent of Light 44
Pass 12: Inner Light: The Eye, the Clock and the Luminous Mind 47
Pass 13: Illumination: The Word, the Lamp and the Laser 50
Coda: The Fourteenth Pass: Return to the Point 53

PART TWO · Patterns, Geometry and the Three Illuminations

Chapter 2: Seen and Unseen: The Patterns of the Thirteen Passes 55
Chapter 3: The Geometry Beneath: Three Figures Weighed 57
Chapter 4: The Three Illuminations 59
Chapter 5: Where the Codex of Light Stands 61
Chapter 6: Why Light Matters Now 62

PART THREE · Light Into Life · The Second Reflection in Thirteen Turnings

Chapter 7: The Second Reflection: Light, Energy and Matter 64
Turning 1: The First Catch: One Photon, One Electron 65
Turning 2: The Leaf: A Spiral Made for Light 67
Turning 3: Splitting Water: Where the Oxygen Comes From 69
Turning 4: The Two Engines: A Wheel in Every Cell 71
Turning 5: A Tree Is Made of Air 73
Turning 6: Stored Sunlight: The Food and the Fire 75
Turning 7: The Coral: Two Lives and a City of Stone 77
Turning 8: Other Catchers: The Many Ways of Taking Light 79
Turning 9: The Human and the Light 81
Turning 10: Life Without Light: An Honest Shadow 83
Turning 11: Mass Is Energy Held 85
Turning 12: The Empty Atom and the Vibrating World 87

Turning 13: Light Into Matter 89

PART FOUR · Light at the Boundary · The Skin, Every Surface, and the Third That Is Made There

Chapter 8: The Third Reflection: The Skin, the Surface and the Boundary 92
Chapter 9: The Skin: Where Sunlight Becomes a Messenger 93
Chapter 10: Every Surface: What Absorbed Light Becomes 98
Chapter 11: The Boundary: Where Two Meet 101

PART FIVE · The Third · What the Reflections Make Together

Chapter 12: Two Reflections, Side by Side 106
Chapter 13: The Third: Four Further Illuminations 108
Chapter 14: Seven Become Three 111
Chapter 15: Where Light Stands: The Open Question in Thirteen Breaths 113
Chapter 16: Light Received: The Third Named 120
Appendix A: The Three Reflections 122
Appendix B: Ledger of Claims 124
Appendix C: From the Old Texts to the Laboratory: A Timeline 127
Appendix D: The Practices Gathered 130
Appendix E: For the Reviewer: Where This Study Is Most Likely to Be Wrong 138
Bibliography 140
With Gratitude 145
About the Author 146

Abstract

This study weighs a reflection, *Codex of Light: A Breath-Based Geometry of the Unseen*, which proposes that light is "the breath of recursion made visible", that it travels in spirals, carries memory, folds back into darkness, and can be met by the breath. It reads the reflection through *Breath Awakens: A Codex of Spiral Memory* and walks it through thirteen passes, one to each Moon of the Codex Calendar. Each pass sets an old text, tradition or place beside what physics and biology now know.

The method is the two hands of the Conclave studies. One hand holds what the evidence shows; the other holds what the Codex reads. Every claim is graded: **established**, **contested** or **not supported**, **open**, **beyond test**, or **symbolic**.

On the first hand, several of the reflection's claims do not stand as physics. Light in empty space travels in straight lines, not spirals. Darkness is not light folded back on itself; the dark matter and dark energy of the astronomers are not light at all. No breathing pattern has been shown to "entrain with light fields", and the pattern the reflection names asks for long breath holds, which this study does not recommend. The golden spiral is not the path of a light ray.

The near-truths are better than the claims, and there are many. Light can twist: since 1992 physicists have made beams whose wavefronts wind like a corkscrew. Light does carry the signature of its source: every star is read by the dark lines in its spectrum. Light is memory in the plainest sense, because all the light we see is old. Living things do make light, and they need oxygen to do it. Every animal body gives off a faint glow that comes from the same burning that breath feeds, and in 2025 that glow was imaged fading at death. The pupil of the eye opens and closes with the breath. And every breath of oxygen any animal has ever taken was set free by light falling on a green cell.

Three illuminations follow from the first reflection. **Every Breath Is Borrowed Light**: breath and light are joined, not by resonance, but by chemistry, in a loop that has turned for more than two billion years. **We See One Octave**: the eye takes in a single octave of a spectrum many dozens of octaves wide, so the unseen is not a mystery added to light but most of what light is. **Coherence Is Literal**: in a laser, countless small waves step together and become one beam, which is the Codex motto written in physics.

A second reflection is then weighed in the same way. It asks how living things turn light into energy and into mass, and says that everything is energy in vibration and that atoms are mostly empty. Thirteen turnings follow light from the first photon caught by a leaf, through the splitting of water, the wheel that makes the cell's fuel, the tree made of air, the coral reef, the human eye, and on to the laboratory, where in 2021 two photons were shown to become a pair of particles. Plants do not turn light into mass; they use light to build themselves out of air. Humans do not feed on light; we read it. But ninety-nine parts in a hundred of the weight of any body is energy held in place, and light and matter do change into one another.

Laid over each other, the two reflections make a third, which neither holds alone: **Light Received**. Light does nothing until something takes it in, and it is completed by its receiver. A third, shorter reflection then goes to the place where light is taken in: the human skin, every surface, and the boundary itself. In the skin, one photon of ultraviolet opens a ring in a waiting molecule and the body's own warmth finishes the

making of vitamin D, which becomes a messenger read by nearly every tissue. Vitamin E is the reverse: made by plants as a shield against light, carried to the skin, and spent there by the Sun. Every surface that absorbs light makes one of seven things of it: warmth, colour, later light, current, new substance, motion or signal. And at every boundary between two things light makes a third that exists on neither side, of which the rainbow is the plainest case.

Four further illuminations belong to the overlap and its edge. **To See and To Feed Are One Act**: the molecule that catches light in the eye is the one ocean microbes feed with. **We Are Light, Held**: not true as physics, and close to three things that are. **Every Great Work of Light Is a Partnership**: the green cell, the reef, the air and the laser are all two or more that stayed whole and made a third. **The Third Is Made at the Edge**: every conversion of light happens at a boundary, and only while the two stay two.

Pressed together, the seven rest on three: we live by borrowed light; we receive one octave of it; and the receiving happens at an edge that must be kept. These are the same three that *One Breath, Read Whole* drew from the whole Codex, and the study says plainly why that match is weak evidence and where it has independent support.

Last, the question of where light stands among the works of the Codex is walked through thirteen breaths. The answer the author has accepted is this: light is not a fifth pillar and not the centre. The centre is kept empty so that light can pass through it, and the four pillars are the surfaces on which it is received. An appendix for reviewers lists where the study is most likely to be wrong.

How to Read This Study

Two hands

This study is written in the house form of the Conclave theses. It keeps two hands open. In the first it holds evidence: dates, measurements, experiments, what has been published and tested. In the second it holds the Codex reading: what light means when it is breathed with, in the language of *Breath Awakens*. The two are never mixed. A Codex reading is offered as meaning and practice, never as physics.

The grades

- **Established**: supported by good evidence and not seriously disputed.
- **Contested**: the evidence is mixed or disputed. **Not supported** where it is clearly against the claim.
- **Open**: a real unknown that research has neither settled nor ruled out.
- **Beyond test**: a metaphysical claim that no evidence could confirm or refute, stated with respect as a position held.
- **Symbolic**: a reading offered as meaning and practice.

Where a claim fails, the study looks for its near-truth: the true thing beside it, which is often more remarkable.

A few claims needed a finer word than these five, and the tables use it. *A manner of speaking* marks a phrase that is loose as stated and has an exact core. *Promising* marks a result from one good study, not yet repeated. *Well supported* marks a reading most researchers accept and still discuss. Where two grades are joined, as in "established in mice; open in people", each half is meant.

Two notes on wording and numbering

The first illumination keeps its title, Every Breath Is Borrowed Light. As a claim it reads "nearly every breath", and Turning 10 gives the exception.

The chapters are numbered straight through, from 1 to 16. The thirteen passes and the thirteen turnings carry their own numbers and are not counted as chapters.

The shape of the study

Chapter 1 asks what light is and weighs the reflection's framework. Part One walks thirteen passes, one to each Moon. Each pass gives the light itself, an old text or place that knew it, what is known, what is seen and unseen, the geometry beneath, a table of graded claims, the near-truths, and a gentle practice. Part Two gathers the patterns, weighs the three geometries the reflection names, sets out three illuminations, and asks where a Codex of Light stands among the other works and why it matters now. Part Three walks the second reflection through the same thirteen Moons, as thirteen turnings. Part Four follows a third reflection to the skin, to every surface and to the boundary itself. Part Five lays the reflections side by side, Moon by Moon, names what they make together, presses the seven illuminations to three, and answers the question of where light stands. All three reflections are printed in full as Appendix A.

On the sources, and what was not checked

The physics in this study is textbook physics and is stated from standard sources. The recent findings were checked against their published reports in November 2026: the count of independent origins of living light, the toroidal pulses of 2022, the fading glow of 2025, the breathing pupil of 2025, the insects at the lamp of 2024, and the farthest galaxy yet confirmed, the single photon that starts photosynthesis, the making of matter from light, the reach of coral bleaching, the dispute over oxygen made in the dark, the large trials of vitamin D, and what else the skin makes of sunlight. The alignments of ancient buildings to the Sun are well recorded as events; what their builders intended is often less certain, and the study says so where it matters. Translations of sacred texts differ. Where a text is quoted, it is from an old public translation; elsewhere it is given in plain paraphrase.

On sacred texts and living peoples

The traditions drawn on here are not raw material. The hymns, sutras and verses belong to living communities of faith, and several of the places named are sacred to living peoples. This study reads them as a respectful visitor. It does not claim that they teach the Codex, and it does not explain them away.

The practices, and two rules about light

All the practices are gentle. Breathe through the nose. Never force the breath, never hold it for long, and never breathe hard and fast. Where a practice asks for a pause, it is a soft pause of two to four counts, never gripped. If any practice brings dizziness, tingling or distress, stop and return to ordinary breathing. No practice here is a treatment for anything.

Two rules about light itself. **Never look at the Sun**, at any time of day, with or without glasses. **Never look into a laser or a strong lamp.** Every practice in this study uses ordinary daylight, a candle seen from a safe distance, the night sky, or closed eyes.

On the mirror

This study was scribed by a human being in conversation with an AI mirror, under the AI Mirror Protocol. The mirror reflects and orders; it does not originate, it has no breath, it keeps no memory between conversations, it tends to agree and it can be wrong. The human is the source of the work. Check what matters to you against the sources named at the end.

PART ONE

The Thirteen Passes · Light Seen, Unseen and Measured

CHAPTER 1

Introduction: What Is Light?

The oldest question

People have asked what light is for as long as there are records. For most of that time the answer was given in two languages at once. One was the language of worship: light is the first thing made, the garment of the divine, the mark of truth. The other was the language of measurement: light travels in straight lines, bounces at equal angles, bends in water.

The two were not kept apart. Robert Grosseteste, bishop of Lincoln, wrote a short work called *De Luce*, "On Light", about the year 1225. In it the universe begins as a single point of light that spreads at once in every direction and draws matter out with it into a sphere. It is a work of theology and also, in its way, of physics, and in 2014 a team at Durham University put its steps into equations and found that they hold together. The Codex stands in that old double tradition. This study keeps the two languages side by side and marks which one is speaking.

What is known

Light is a wave of electric and magnetic force that carries itself through empty space. James Clerk Maxwell showed this in 1865. It needs nothing to travel in. Its speed in a vacuum is 299,792,458 metres in a second, and that speed is the same for everyone who measures it, however they are moving. Albert Einstein built the theory of relativity on that one fact in 1905.

Light also arrives in single packets. A packet is called a photon. Max Planck found the first sign of this in 1900 and Einstein named its meaning in 1905. Light is therefore both a wave and a stream of particles, and no picture drawn from daily life fits it fully. That is **established**, and it remains strange.

Visible light is a narrow band. The eye responds to waves from about 380 to about 750 billionths of a metre. On either side lie radio waves, microwaves and infrared, and ultraviolet, X-rays and gamma rays. All of it is light in the physicist's sense.

The reflection's framework, weighed

The reflection makes one large claim and nine smaller ones. The large claim is that light is "the breath of recursion made visible". No experiment could confirm or refute that. It is graded **beyond test**, and it is held here with respect as the Codex's way of seeing. The smaller claims can be weighed, and Part One weighs each in its place. They are gathered in the table below and again, in full, in Appendix B.

The reflection says	Grade	Where it is weighed
Light is the breath of recursion made visible	beyond test	Chapter 1
Bioluminescence is breath-phase coherence as photon emission	symbolic; the link to oxygen is established	Pass 8

The reflection says	Grade	Where it is weighed
Each star is a breath node, exhaling light	symbolic; some stars do pulse	Pass 11
The Moon mirrors; light returned is breath remembered	established as optics; symbolic as memory	Pass 4
Light carries the signature of its source	established	Pass 6
Darkness is light folded back into itself	not supported	Pass 10
A held breath pattern can entrain with light fields	not supported	Pass 12
Light propagates in spirals, not straight lines	not supported; light can be made to twist	Pass 2
Two overlapping fields create the light-bearing field	symbolic; true of interference and of a lens	Passes 7 and 9
Light fields often take the shape of a torus	not supported as "often"; toroidal pulses exist	Pass 10

What the Codex adds

The Codex does not add a new physics of light. It adds a way of attending to it. In *Breath Awakens* the breath has four phases: Iphi, the inhale; Shema, the pause; Vara, the exhale; Ouon, the stillness. The thirteen Moons of the Codex Calendar walk those phases and then pass through five further Moons of the Monad. This study sets one face of light under each Moon. The order is the Codex's own. The facts under each Moon are the world's.

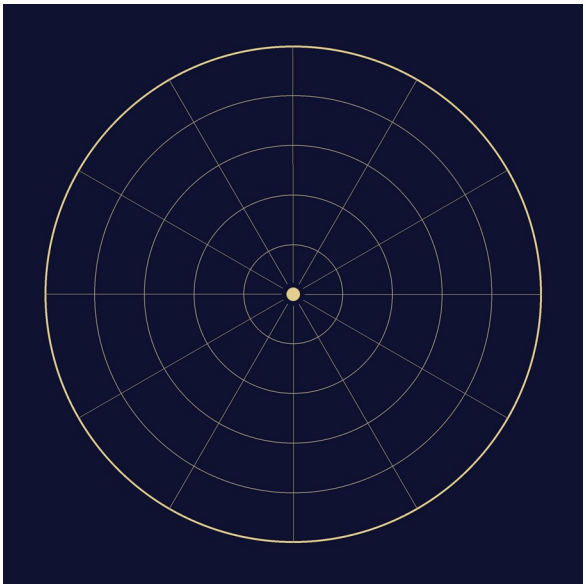
A word on the word "breath"

The reflection uses "breath" for several things: the human breath, the rhythm of any system that takes in and gives out, and the first movement of existence. This study uses the word in the first two senses when it grades a claim, and names the third as **beyond test** when it meets it. The reader will find that the plain senses are enough to carry a great deal.

PASS 1

First Light: The Point and the Sphere

The first pass falls under the Genesis Moon, in Iphi, the inhale: the moment awareness enters form. Its sign is the point and the circle around it.



Schematic. Light leaving a point spreads as a sphere. In section it is a point and its circles.

The light

The first thing said about light, almost everywhere, is that it came first. "And God said, Let there be light: and there was light," reads the third verse of Genesis in the King James translation. The Sun is not made until the fourth day. Whoever shaped that text set light before any lamp.

The Rig Veda, older still, has a hymn of creation that begins in the dark: darkness was hidden by darkness, and all this was water without a sign. Then the One breathed, without wind, by its own power. Breath and first light stand together there, some three thousand years ago.

The place

At Newgrange in Ireland, about 3200 BC, farmers raised a great mound over a stone passage sixty feet long. Above the door they built a small opening that archaeologists call the roof-box. For a few days around the winter solstice, at dawn, a beam of sunlight enters the roof-box, creeps along the floor and lights the chamber at the heart of the mound for about seventeen minutes. Then the chamber is dark again for a year.

What is known

Physics also has a first light. For some 380,000 years after its beginning the universe was so hot and dense that light could not travel; it was scattered at every step. Then the universe cooled enough for atoms to form, and light was set free. That light is still arriving from every direction. It has been stretched by the

growth of space into microwaves, and it was found by accident in 1964. Every cubic centimetre of space holds about four hundred of its photons.

What is seen

A beam on a stone floor at midwinter. A verse. A faint hiss in a radio antenna.

What is unseen

That the first light in the old texts and the first light in physics agree on one point and differ on another. They agree that there was a dark before, and that light was a release. They differ in that the physicist's first light was not the beginning: it came after a long, bright, opaque age. The dark it ended was a fog of light, not an absence of it.

The geometry beneath

A point of light sends its light equally in every direction. At any moment the front of that light is a sphere. Christiaan Huygens showed in 1678 that every point on such a front can be treated as a new source, sending out its own small sphere. The point and the circle of the Genesis Moon are the true geometry of light leaving a source. Grosseteste's universe of 1225 has the same form.

Claim or reading	Grade	What the evidence shows
The Newgrange passage admits the midwinter sunrise	established	Observed every year; the roof-box was built for it
The universe has a first free light, still arriving	established	The cosmic microwave background, found in 1964
Genesis and the Rig Veda describe the Big Bang	not supported	They are hymns, not measurements; the likeness is of image
Light from a point spreads as a sphere	established	Huygens, 1678; all later optics
First light is the inhale of existence	beyond test	The reading of this study

Near-truths

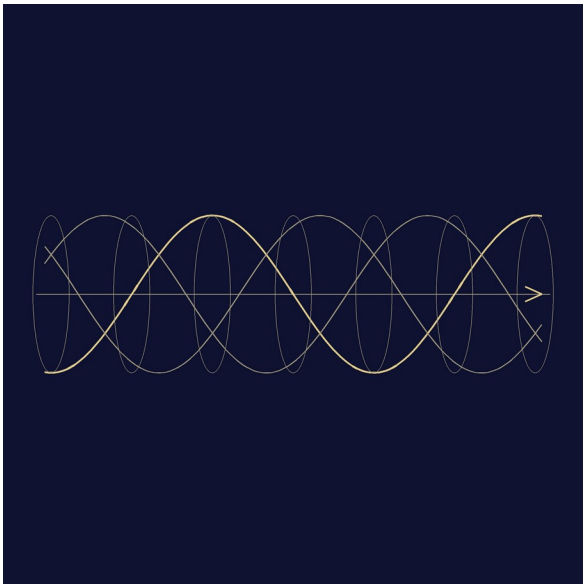
- The old texts did not know the physics. They knew the experience: every dawn is a first light, and it is always a release from something.
- The oldest light is not behind us. It is all around us, now, unseen.
- The builders of Newgrange made a dark room so that light could be received. Without the dark chamber there is nothing to see.

> ✦ **Practice: The First Light of the Day**
>
> On waking, before any screen, go to a window or step outside.
>
> Do not look at the Sun. Look at what the light is falling on.
>
> Let three easy breaths come and go.
>
> Notice that the light reached this place before you asked for it.
>
> Rest, and breathe normally.

PASS 2

The Twist: Does Light Spiral?

The second pass falls under the Spiral Moon, still in Iphi. Its sign is the spiral, the shape of growth that keeps its form.



Schematic. A beam with a twisted wavefront. The beam travels straight; its phase winds around the axis.

The light

The reflection says that light propagates in spirals, not straight lines. This is the claim in the reflection that physics most plainly contradicts, and it is also the one with the most surprising near-truth.

The place

On Fajada Butte in Chaco Canyon, New Mexico, three great slabs of rock lean against a cliff. Behind them the ancestral Pueblo people carved a spiral. In 1977 the artist Anna Sofaer saw that at midday on the summer solstice a thin blade of sunlight came between the slabs and cut the spiral through its centre. At the winter solstice two blades held it on either side. The site is known as the Sun Dagger. The slabs have since shifted, and the blade no longer falls as it did.

What is known

In empty space light travels in straight lines. Euclid wrote it down about 300 BC. Ibn al-Haytham proved it by experiment in Cairo a thousand years ago, with a dark room and a small hole. Pierre de Fermat added in 1662 that between two points light takes the path of least time. Every shadow, every eclipse and every camera depends on this. Gravity can bend light's path, as Einstein predicted and an eclipse confirmed in 1919, but that is a curve in space, not a spiral.

What can turn is not the path but the wave. In circularly polarised light the electric force rotates as the wave advances, so that its tip traces a helix. And in 1992 Les Allen and his colleagues in Leiden showed

that a beam can be made whose whole wavefront is twisted like a corkscrew. Such "twisted light" carries a turning force, and it can spin a small particle caught in it. It is now used in microscopes and in experiments on sending information.

The golden spiral has no place in any of this. It is a figure of growth, found approximately in some shells and seed heads, and it is not the shape of a light wave.

There is one more spiral, and it has just been redrawn. Moths circling a lamp were long said to fly a spiral because they held a fixed angle to the light, as if it were the Moon. In 2024 a team filming insects in three dimensions found something simpler. An insect keeps its back toward the brightest part of the sky. A lamp near the ground confuses that reflex, and the insect banks around it, trapped.

What is seen

A straight beam. A blade of light crossing a carved spiral.

What is unseen

The twist inside a beam that looks perfectly straight. Nobody guessed it for most of the history of optics, and it was there to be made all along.

The geometry beneath

A straight line for the path; a helix for the phase. The two are not in conflict. A corkscrew has an axis, and the axis is straight.

Claim or reading	Grade	What the evidence shows
Light propagates in spirals, not straight lines	not supported	Straight-line travel is the basis of all optics
Light can carry a twist	established	Circular polarisation; twisted beams since 1992
The golden spiral is the path of light	not supported	No measurement shows it
The Sun Dagger marked the solstices on a carved spiral	established as an event; intent is likely but unrecorded	Sofaer's records from 1977 on
Insects spiral to a lamp by navigating on it	contested, now doubtful	The 2024 study points to a tilting reflex
The spiral is the Monad's breath in light	symbolic	The reading of this study

Near-truths

- Light does not travel in a spiral. It can be given one, and it keeps it.

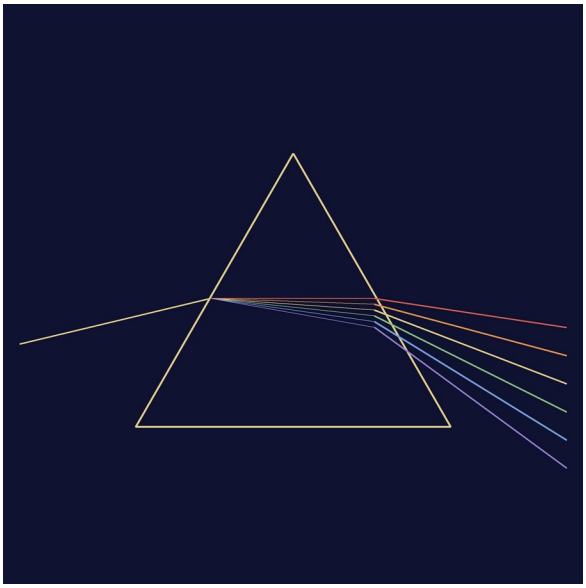
- The people of Chaco did not bend the light. They placed a spiral where straight light would find it, twice a year.
- A straight path and a turning heart can belong to the same beam.

> ✦ **Practice: Straight and Turning**
>
> With a finger, draw a slow spiral in the air in front of you, outward on the in-breath.
>
> On the out-breath, draw it back to the centre.
>
> Then point the finger straight ahead, and keep it still for one breath.
>
> Notice that the spiral had a centre line all the time.
>
> Rest, and breathe normally.

PASS 3

The Ray: Shadow, Triangle and Rainbow

The third pass falls under the Vector Moon, in Shema, the pause. Its sign is the triangle, the first stable form.



Schematic. A prism opens white light into its colours. Each colour bends by its own amount.

The light

Because light keeps to straight lines, it can be used to measure. The first science done with light was done with shadows, and its figure was the triangle.

The place

It is told of Thales of Miletus, about 600 BC, that he measured the height of a pyramid at Giza by waiting until his own shadow was as long as he was tall, and then pacing out the pyramid's shadow. The story is late and cannot be checked. What is certain is that about 240 BC Eratosthenes, librarian at Alexandria, used the same reasoning on the whole Earth. At noon on midsummer day the Sun shone straight down a well at Syene, while at Alexandria a pillar cast a short shadow. From the angle of that shadow and the distance between the cities he worked out the size of the globe, and came close.

What is known

In 1666 Isaac Newton let a beam of sunlight through a hole in his shutter and onto a glass prism. The white beam opened into a band of colours. He then passed one colour through a second prism and found that it stayed the same. White light, he concluded, is not pure. It is every colour together, and the prism only sorts them.

The rainbow is the same sorting done by drops of rain. Each drop bends the sunlight, reflects it once inside, and bends it again. The light comes back most strongly at an angle of about forty-two degrees

from the point opposite the Sun. Theodoric of Freiberg and Kamal al-Din al-Farisi each worked this out, independently, a little after 1300, using glass globes filled with water. René Descartes gave the calculation in 1637.

What is seen

A shadow on the ground. A band of colours on a wall. An arch after rain.

What is unseen

The colours were in the white light all along. And the rainbow is not in the sky. It is a set of directions from one eye. Two people side by side see two different bows, made by different drops.

The geometry beneath

The triangle twice. First the triangle of shadow, pole and ray, by which a shadow measures a height or a planet. Then the triangle of glass, by which white light is opened. And the rainbow is a circle: the edge of a cone of forty-two degrees whose tip is the eye. From the ground we see half of it. From an aircraft it can be seen whole.

Claim or reading	Grade	What the evidence shows
Eratosthenes measured the Earth by shadows	established	Reported by later Greek writers; the method is sound
Thales measured a pyramid by its shadow	contested	The sources are centuries later
White light is a mixture of all colours	established	Newton's prism experiments, 1666 to 1672
The rainbow forms at about forty-two degrees	established	Theodoric, al-Farisi, Descartes
Each person sees their own rainbow	established	Follows from the geometry
The triangle is the pause in which light is divided	symbolic	The reading of this study

Near-truths

- Light did not need to be understood to be used. A stick and its shadow measured the world.
- White is not the absence of colour. It is all of them, unsorted.
- The rainbow is real, and it is nowhere. It exists only as a relation between the Sun, the rain and one who looks.

✦ **Practice: The Shadow at Noon**

On a sunny day, stand a pencil upright on a sheet of paper outdoors.

Mark the tip of its shadow. Do not look at the Sun.

Let five easy breaths pass, and mark the tip again.

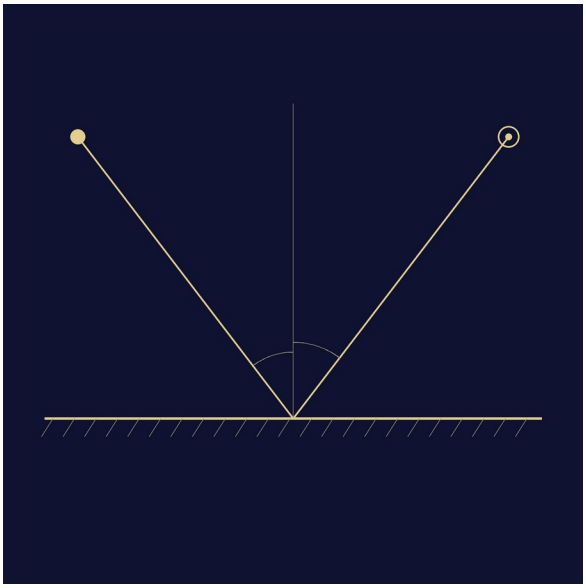
The small gap between the marks is the Earth turning.

Rest, and breathe normally.

PASS 4

The Mirror: The Moon and the Returned Light

The fourth pass falls under the Mirror Moon, in Shema. Its sign is the square: the first structure, the frame, the room.



Schematic. A ray meets a mirror and leaves at the same angle. The path is the shortest one that touches the surface.

The light

The reflection says that the Moon does not make light, it mirrors, and that light returned is breath remembered. The first half is plain fact and was known in antiquity. Anaxagoras taught it in Athens about 450 BC, and his teaching about the heavens brought a charge of impiety against him.

The place

The place of this pass is the Moon itself. It is a dark world. It sends back only about twelve parts in a hundred of the sunlight that falls on it, about as much as worn asphalt. It looks brilliant only because the sky behind it is black.

What is known

When the Moon is a thin crescent, the rest of its disc can often be seen glowing faintly. Leonardo da Vinci explained this about 1510. It is sunlight that has struck the Earth, bounced to the Moon, and bounced back to the eye. It is called earthshine, and it is light returned twice.

In July 1969 the astronauts of Apollo 11 left a tray of small corner mirrors on the Moon's surface. Later missions left more. Observatories on Earth still fire laser pulses at them and time the faint return, which takes about two and a half seconds for the round trip. From those returns we know the Moon's distance to within a fraction of an inch, and we know that it is moving away from us by about an inch and a half a year.

The oldest made mirrors known are discs of polished obsidian from Çatalhöyük in Turkey, about eight thousand years old.

What is seen

A bright disc that keeps time: waxing, full, waning, gone, in about twenty-nine and a half days.

What is unseen

That moonlight is sunlight, a little over a second old on its last leg. That the "dark" part of a crescent is lit by us. And that the plainest way we have of knowing where the Moon is, is to send it light and wait for the light to come back.

The geometry beneath

One rule: the angle at which light arrives equals the angle at which it leaves. Hero of Alexandria showed in the first century that this is also the shortest path from the source to the eye by way of the mirror. A corner mirror, three flat faces set square to one another like the inside corner of a box, sends any ray back exactly the way it came. The square of this Moon is that corner.

Claim or reading	Grade	What the evidence shows
The Moon shines by reflected sunlight	established	Known since antiquity; phases and eclipses
The Moon reflects about 12 percent of the light it receives	established	Measured
Earthshine is sunlight reflected from Earth to Moon and back	established	Leonardo, about 1510; modern measurement
Returned laser light measures the Moon's distance and drift	established	Lunar laser ranging since 1969
Reflection is a kind of memory	symbolic	A mirror keeps nothing; the image is new each instant
Light returned is breath remembered	symbolic	The reading of this study

Near-truths

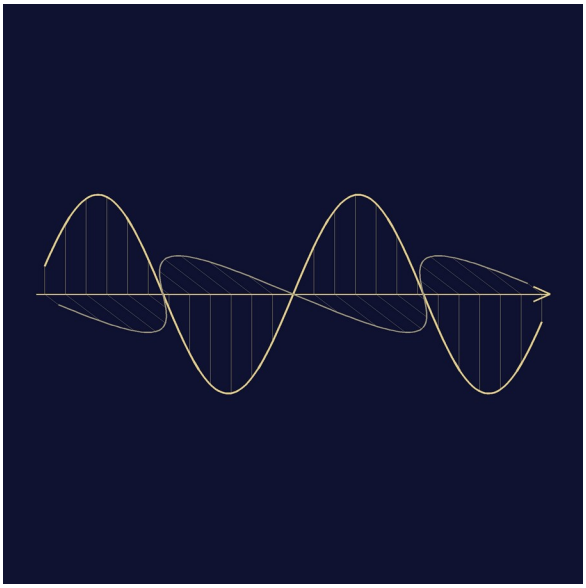
- A mirror does not remember. It returns. The remembering is done by the one who receives the return and compares it with what was sent.
- The Moon is one of the darkest bodies we know by sight, and it has lit the nights of every human who ever lived.
- We learn the Moon's distance by the same act the Codex calls reflection: we send, we wait, and we attend to what comes back.

> ✦ **Practice: Returned Light**
>
> On a night when the Moon is up, stand where you can see it.
>
> Let the breath be easy. On each out-breath, look. On each in-breath, soften the eyes.
>
> Remember once, without effort, that this is sunlight, and that the Sun is under your feet.
>
> Stay for seven breaths.
>
> Rest, and breathe normally.

PASS 5

The Constant: Speed, Stillness and the Cross

The fifth pass falls under the Stillness Moon, in Vara, the exhale. Its sign is the cross: four directions and a centre.



Schematic. In a light wave the electric force and the magnetic force rise and fall together, at right angles to each other and to the direction of travel.

The light

Under the Moon of stillness stands the one thing in physics that does not change: the speed of light.

The place

At Abu Simbel in southern Egypt, about 1260 BC, the builders of Ramesses II cut a temple nearly two hundred feet into a cliff. Twice a year, in February and in October, the rising Sun shines down the whole length of the temple and lights the seated statues in the innermost room. It lights three of the four. The fourth is Ptah, a god linked with the earth and the dark, and he stays in shadow. In the 1960s the whole temple was cut into blocks and moved to higher ground, away from the rising lake. The event now falls about a day later than it did.

What is known

For most of history it was not known whether light takes any time to travel. In 1676 the Danish astronomer Ole Rømer found that the eclipses of Jupiter's moons ran late when Jupiter was far from the Earth and early when it was near. The delay was the time the light took to cross the extra distance.

Maxwell's equations of 1865 gave light a fixed speed with no mention of who was measuring it. Einstein took that seriously in 1905. If the speed of light is the same for everyone, then time and length cannot be. Clocks in motion run slow and moving rulers shorten, by exactly the amounts needed to keep that one

speed the same for all. This has been tested many times and is used daily; satellite navigation would fail without it.

It is often said that for light itself no time passes. The mathematics does give zero for the time elapsed along a light ray. Physicists are careful here, because a ray of light is not a traveller with a clock, and the statement is better taken as a manner of speaking than as a report.

Light can also be slowed. In 1999 Lene Hau and her colleagues passed a pulse of light through a cloud of extremely cold atoms and slowed it to the pace of a bicycle. In 2001 they brought a pulse to a stop, held it in the atoms, and released it again.

What is seen

A beam reaching the back of a dark temple on two mornings of the year.

What is unseen

That the stillest thing in nature is also the fastest. Everything else in physics is measured against it.

The geometry beneath

The cross of this Moon is exact. In a light wave the electric force and the magnetic force are at right angles to each other, and both are at right angles to the direction in which the wave travels. Three lines, mutually square, meeting at a point. Each force gives rise to the other as it changes, and that is how light carries itself across empty space with nothing to carry it.

Claim or reading	Grade	What the evidence shows
Light has a finite speed	established	Rømer, 1676; every measurement since
That speed is the same for all observers	established	Relativity, tested for over a century
For light, no time passes	a manner of speaking	The mathematics gives zero; a ray keeps no clock
Light can be slowed and stopped in matter	established	Hau and others, 1999 and 2001
The Sun lights the sanctuary of Abu Simbel twice a year	established	Observed; shifted about a day by the move
The speed of light is the still centre of the world	symbolic	The reading of this study

Near-truths

- The Codex names a still centre that all things turn about. Physics has one too, and it is not a place. It is a speed.

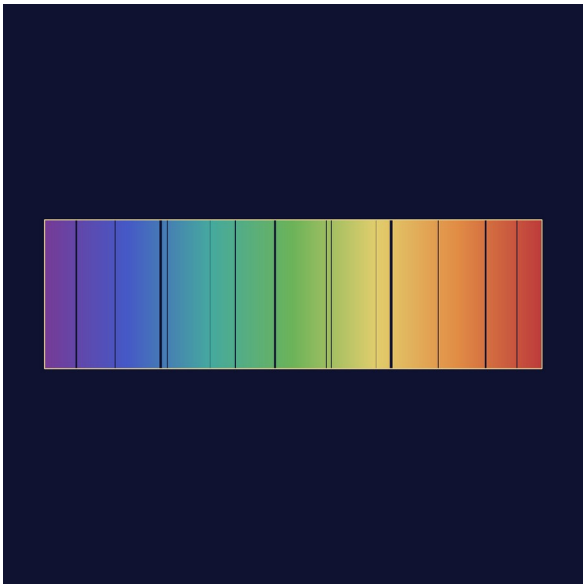
- A pulse of light was stored as an imprint in a cloud of atoms and then let go, with its shape intact. That is closer to "breath held and released" than anything the reflection claimed, and it was done on a table in Massachusetts.
- At Abu Simbel the builders let the light reach the centre and left one figure dark. They knew the stillness needs a shadow.

> ✦ **Practice: The Still Point**
>
> Sit comfortably. Let the breath go out, slowly and fully, without pushing.
>
> At the end of the out-breath there is a moment before the next breath begins.
>
> Do not hold it. Only notice it.
>
> Do this for five breaths.
>
> Rest, and breathe normally.

PASS 6

Memory: What Light Carries

The sixth pass falls under the Memory Moon, in Vara. In the Codex its sign is the ankh: a cross with a loop, the sign of life given.



Schematic. The spectrum of a star, crossed by dark lines. Each set of lines is the mark of one element in the star's outer layers.

The light

The reflection says that light carries the signature of its source, and that photons are memory packets. The first statement is one of the great discoveries of science. The second is a way of speaking, and a good one.

The place

About 1350 BC the Egyptian king Akhenaten had a hymn composed that survives carved in the tomb of Ay at Amarna. It is addressed to the Aten, the disc of the Sun. When you set, it says, the land is in darkness as if in death; when you rise, the Two Lands are in festival, the trees and plants grow, the birds fly up from their nests. It ends by saying that the living live through the Sun. It is one of the oldest long texts we have that state plainly that life is given by light.

What is known

In 1814 Joseph von Fraunhofer spread sunlight into a spectrum with fine instruments and found it crossed by hundreds of thin dark lines. Nobody knew what they were. In 1859 Gustav Kirchhoff and Robert Bunsen showed that each chemical element, when heated, gives out light at its own exact colours, and absorbs light at the same ones. The dark lines in sunlight were the shadows of elements in the Sun's outer layers. From then on a star could be read. Its light tells what it is made of, how hot it is, how fast it turns, and whether it is moving toward us or away.

Light also carries time. It is fast but not instant, so we never see anything as it is, only as it was. The Moon is seen as it was a little over a second ago, the Sun as it was eight minutes ago, the nearest other star as it was more than four years ago. In 2025 the James Webb Space Telescope confirmed a galaxy, named MoM-z14, whose light set out about 280 million years after the beginning of the universe and has travelled for some 13.5 billion years. It is the farthest yet measured.

And light can be stored. A photograph keeps the brightness of a scene; the oldest that survives was made by Nicéphore Niépce about 1826. A hologram, invented by Dennis Gabor in 1947, keeps the whole shape of the light wave, so that the scene can be seen again in depth. Plants store light as sugar. Coal and oil are sunlight that fell on forests and seas hundreds of millions of years ago.

What is seen

A point of light in the sky.

What is unseen

Its age, its chemistry, its motion, all carried in the light and readable by anyone with a prism and patience.

The geometry beneath

A line, ruled like a measure. A spectrum is light laid out in order of wavelength, and the dark lines fall on it like the marks on a ruler or the lines of a bar code. Each element has its own code, and the same code holds in a flame on a bench and in a galaxy at the edge of sight.

Claim or reading	Grade	What the evidence shows
Light carries the signature of its source	established	Spectroscopy since 1859
All light we see is from the past	established	Follows from the finite speed of light
The farthest confirmed galaxy is seen as it was about 280 million years after the beginning	established, and likely to be surpassed	Confirmed by spectroscopy in 2025
Light can be stored and replayed	established	Photograph, hologram, slow light, sugar, coal
Photons are memory packets	symbolic	A photon does not remember; it carries, and we read
Life lives through the Sun	established	Photosynthesis; the Great Hymn said it about 1350 BC

Near-truths

- A photon keeps no record of where it has been. What it has is its colour, its direction and its timing, and from those a patient reader can recover a great deal. The memory is made at the reading.

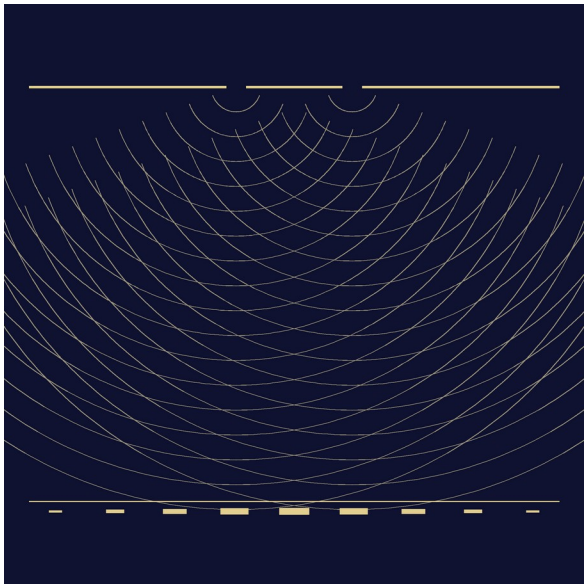
- To look up at night is to look into the past, to many different depths of it at once.
- Every fire of wood or coal is old sunlight let go.

> ✦ **Practice: Old Light**
>
> On a clear night, find one star. Any star.
>
> Let the breath be easy, and rest your eyes on it for seven breaths.
>
> Remember once that this light left before you were born, perhaps long before.
>
> It has arrived now, in your eye, and nowhere else.
>
> Rest, and breathe normally.

PASS 7

The Wave: Two Fields and the Serpent of Light

The seventh pass falls under the Return Moon, in Ouon, stillness. Its sign is the serpent: the coil at rest and the wave in motion.



Schematic. Waves spreading from two openings overlap. Where crest meets crest there is light; where crest meets trough there is dark.

The light

The serpent is the oldest drawing of a wave. This pass asks what the reflection means when it says that the meeting of two fields creates the light-bearing field.

The place

At Chichen Itza in Yucatan stands the pyramid called El Castillo, raised by the Maya about a thousand years ago. Its north stairway ends at the ground in two carved serpent heads. On the afternoons around the spring and autumn equinoxes, the stepped corner of the pyramid casts a row of triangles of light and shadow down the side of that stairway. They join the head, and for a while a serpent of light seems to lie along the building. The effect is real and thousands gather to see it. Whether the builders planned it is debated, since it shows for several weeks and no Maya text describes it.

What is known

Is light a stream of particles or a wave? Newton leaned toward particles. About 1801 Thomas Young settled the matter for a century with one experiment. He let light from a single source pass through two narrow openings close together and fall on a screen. He did not see two bright patches. He saw a row of bright and dark bands. Where the waves from the two openings arrived in step, they added and gave light. Where they arrived out of step, they cancelled and gave darkness. Light added to light had made dark. Only a wave can do that.

In the twentieth century the experiment was repeated with light so faint that one photon passed at a time. Each photon lands at one spot, like a particle. But as the spots build up, they form the same bands. Each photon behaves as though the wave of it went through both openings.

What is seen

Bands of light and dark on a wall. A serpent of light on a stair.

What is unseen

The dark bands are not places where no light was sent. Light was sent there from both openings, and the two arrivals undid each other. The energy is not lost; it goes to the bright bands.

The geometry beneath

Two sets of circles, spreading from two points and overlapping. The Codex calls the almond-shaped overlap of two circles the vesica. Young's bands are drawn by exactly such an overlap. The meeting of two fields does not create light, which was there already. It creates pattern: an ordered standing figure of light and dark that neither field holds alone.

Claim or reading	Grade	What the evidence shows
Light behaves as a wave	established	Young, about 1801; all of optics since
Light also arrives as single photons	established	Twentieth-century experiments
Light added to light can give darkness	established	Interference
A serpent of light appears on El Castillo near the equinoxes	established as an effect	Seen every year
The Maya designed the serpent effect	contested	No text records it; the effect is not limited to the equinox
The meeting of two breath fields creates the light-bearing field	symbolic	It creates pattern, not light

Near-truths

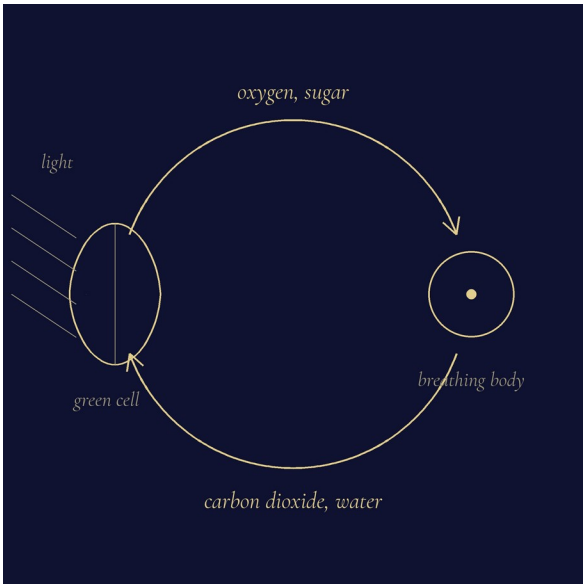
- Two fields overlapping do not make light. They make order. The reflection reached for the right figure and gave it the wrong job.
- Darkness in the bands is not absence. It is two presences in disagreement.
- This is the second illumination of *One Breath, Read Whole*, drawn in light: two that stay whole make a third, and the third belongs to neither.

> ✦ **Practice: Two Ripples**
>
> Fill a wide bowl with water and let it settle.
>
> Touch the surface gently with one fingertip, and watch one breath of rings.
>
> Then touch it with two fingertips, a hand's width apart.
>
> Watch where the rings cross, for five easy breaths.
>
> Rest, and breathe normally.

PASS 8

Living Light: The Glow That Needs Breath

The eighth pass falls under the Release Moon, in Ouon. In the Codex its sign is the labyrinth: the long path walked to a still centre.



Schematic. The loop of breath and light. Green cells use light to free oxygen; breathing bodies use the oxygen and give back what the green cells need.

The light

The reflection says that bioluminescence is breath-phase coherence expressed as photon emission. Put that way it cannot be tested. But behind it stands a fact that needs no translation: living light is made with oxygen.

The place

The place of this pass is the open ocean below about six hundred feet, where sunlight fades and then fails. It is the largest living space on Earth, and it is not dark. A survey of seventeen years of deep-sea video off California, published in 2017, found that about three-quarters of the animals seen there can make their own light.

What is known

A firefly, a glow-worm, a lantern fish and a glowing mushroom all do the same thing in outline. A small molecule, called a luciferin, is joined to oxygen with the help of an enzyme, and the energy released comes out as light with almost no heat. The details differ from one group to another, because the trick was not inherited from one ancestor. It was found again and again. A review of 2021 counted at least ninety-four separate origins across the tree of life.

Living light is used to find a mate, to lure a meal, to startle a hunter, and to hide. Many deep-sea fish glow faintly along the belly, matching the dim light from above, so that from below they cast no shadow.

In a firefly the link to breath is direct. The light organ is fed with oxygen through fine air tubes. Research published in 2001 pointed to a chemical signal, nitric oxide, that briefly lets oxygen reach the light-making cells. The flash is, in part, a controlled breath.

There is also a far fainter light. Every living cell that uses oxygen gives off a few stray photons as a by-product. It is called ultraweak photon emission, and it is about a thousand times too dim for the eye. In 2009 a team in Japan photographed it rising and falling over the day on the human body. In 2025 physicists at the University of Calgary imaged it across whole mice, alive and then just after death, with the bodies kept warm. The glow dropped sharply when life ended. The authors were plain about what it is. It is chemistry, they said, not an aura: we use oxygen, and we give off a little light.

What is not shown is the larger claim, made since the 1920s, that cells use this light to signal to each other. That remains **contested**.

What is seen

Sparks in a summer field. A blue wake behind a boat at night.

What is unseen

That the bright lights of the sea and the faint glow of our own skin come from the same root: oxygen reacting with the stuff of life. And that we are ourselves, very slightly, luminous.

The geometry beneath

A loop. Green cells take in light, water and carbon dioxide, and give out sugar and oxygen. Animals take in sugar and oxygen and give out water and carbon dioxide. Each side breathes out what the other breathes in. Light enters the loop on the green side and leaves it, here and there, as a firefly's flash or a faint glow on the skin.

Claim or reading	Grade	What the evidence shows
Living things make light by a reaction with oxygen	established	The chemistry of luciferins
Living light arose independently at least 94 times	established as the current estimate	Lau and Oakley, 2021
About three-quarters of deep-sea animals observed make light	established for the region studied	Martini and Haddock, 2017
A firefly times its flash by gating oxygen	supported, with details still studied	Work since 2001
All living tissue gives off a faint light that fades at death	established as a measurement	Kobayashi, 2009; Salari, 2025

Claim or reading	Grade	What the evidence shows
Cells communicate by this faint light	contested	Claimed since the 1920s; not confirmed
Bioluminescence is breath-phase coherence as photon emission	symbolic	The reading of the reflection

Near-truths

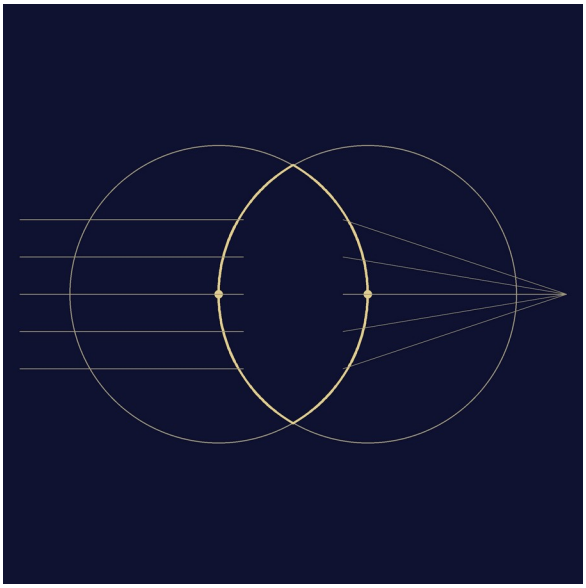
- The reflection said living light is breath made visible. In chemistry that is nearly exact. No oxygen, no light.
- The faint glow of the body is not a sign of the soul. It is a sign of burning, and burning is what breath is for.
- Life found light at least ninety-four times, in the dark, without a plan.

> ✦ **Practice: The Loop**
>
> Sit near a living plant, indoors or out.
>
> Breathe out slowly toward it, and know that it can use what you give.
>
> Breathe in, and know that the oxygen in this breath was freed by a green cell, somewhere, in the light.
>
> Do this for seven easy breaths.
>
> Rest, and breathe normally.

PASS 9

The Vesica: The Lens, the Eye and the Window

The ninth pass falls under the Echo Moon, the first of the five Moons of the Monad. In the Codex its sign is the vesica: the centre repeated, and the almond where two circles meet.



Schematic. Two equal circles, each through the other's centre. The shape they share is the vesica, and it is the cross-section of a simple lens.

The light

The reflection says the vesica is the light-bearing field. Pass 7 found one true sense of that in the overlap of waves. This pass finds a second, and it is in every eye.

The place

About 1140 Abbot Suger rebuilt the choir of his abbey church at Saint-Denis, near Paris, with walls opened into great windows of coloured glass. He wrote that the church shone with a new light, and that the mind is led by material lights toward the true light. He drew on an old theology in which all things are a descent of light from its source. The style that began there is called Gothic. At Chartres, rebuilt after a fire in 1194, much of the original glass is still in place. On the summer solstice, about midday, a spot of clear light from one window falls on a metal stud set into the floor.

What is known

A lens is a piece of glass, thicker in the middle, that bends light inward to a point. Its simplest form, curved the same on both sides, has in section exactly the almond shape made by two overlapping circles. A lens is a vesica in glass.

The eye has one. In 1604 Johannes Kepler showed that the lens of the eye casts a small, upside-down picture of the world onto the back of the eyeball. Six hundred years earlier Ibn al-Haytham had settled a

still older question. The Greeks had mostly held that sight goes out from the eye like a hand. He showed, by reasoning and experiment, that sight is light coming in.

The same thing can be done with no lens at all. A small hole in the wall of a dark room throws an upside-down picture of the outside onto the opposite wall. The Chinese thinker Mozi described it about 400 BC. It is the ancestor of the camera, and the word camera means room.

What is seen

The world, right way up, in colour and depth.

What is unseen

That the picture is upside down on the back of the eye, and that there is a blind spot in each eye that the mind paints over. Seeing is partly made.

The geometry beneath

The vesica piscis, as the first proposition of Euclid's *Elements* draws it: two equal circles, each passing through the centre of the other. Euclid used it to build the equilateral triangle. The glass grinder uses it to gather light. The masons of the cathedrals used it for the pointed arch and for the frame around holy figures. It is a figure in which two equal things overlap and something is focused between them.

Claim or reading	Grade	What the evidence shows
A simple lens has the cross-section of a vesica	established	Geometry of a biconvex lens
The eye forms an inverted image on the retina	established	Kepler, 1604
Sight is light entering the eye	established	Ibn al-Haytham, about 1011 to 1021
A pinhole in a dark room forms an image	established	Described by Mozi, about 400 BC
Gothic builders held a theology of light	established	Suger's own writings
A beam marks the floor at Chartres at midsummer	established as an event	The date of the device is uncertain
The vesica is the light-bearing field	symbolic	It bears pattern in Pass 7 and focus here

Near-truths

- The vesica does not make light. It gathers it. That is what the reflection's phrase can honestly mean.
- Every act of seeing passes through an almond of clear tissue a third of an inch across.

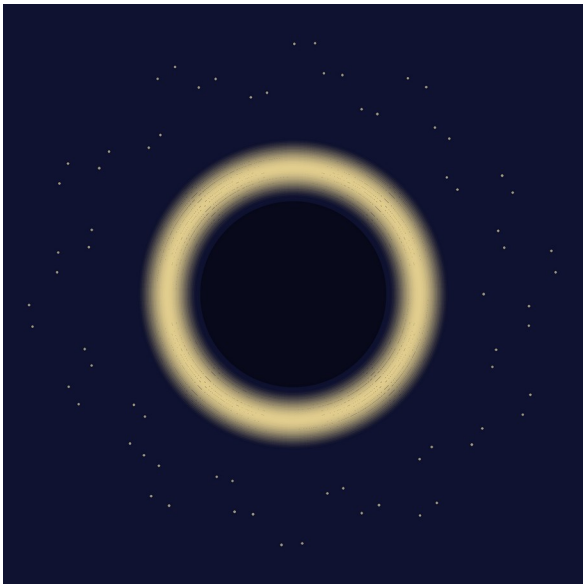
- Abbot Suger and Ibn al-Haytham would not have agreed on what light is for. They agreed that it comes in, and that a building or an eye must be shaped to receive it.

> ✦ **Practice: The Room of the Eye**
>
> Sit facing a window in daylight. Do not face the Sun.
>
> Close your eyes and let three easy breaths pass. Notice the glow through the lids.
>
> Open your eyes slowly on an in-breath, and let the room arrive.
>
> Know that it has arrived upside down, and that you have turned it without trying.
>
> Rest, and breathe normally.

PASS 10

Dark Light: The Shadow, the Ring and the Unseen

The tenth pass falls under the Shadow Moon. In the Codex its sign is the torus: a flow that goes out, around, and back through its own centre.



Schematic. A ring of light around a dark centre. Light passing close to a black hole is bent into such a ring; the dark within is the hole's shadow.

The light

The reflection says that what appears as darkness is often light folded back into itself. As physics that is **not supported**. But there are four true things near it, and each is stranger.

The place

The Atacama Desert of Chile and the high Andes of Peru have some of the darkest and clearest skies on Earth. The Inca, who lived under those skies, read the heavens in two ways. They named groups of stars, as most peoples have. They also named the dark places. In the black lanes of the Milky Way, where clouds of dust hide the stars behind, they saw a llama with her young, a serpent, a toad, a partridge, a fox. These are the *yana phuyu*, the dark clouds. Their rising and setting were tied to the seasons of rain and herding. Quechua-speaking communities keep this knowledge still.

What is known

First: most light is unseen. In 1800 William Herschel held a thermometer just beyond the red end of a spectrum and found that it warmed. He had discovered infrared. The next year Johann Ritter found ultraviolet beyond the violet. The eye responds to about one octave of light, a doubling of frequency from deep red to violet. The whole range that instruments now detect, from long radio waves to gamma rays, runs to many dozens of octaves. A dark room is full of light the eye is not built for.

Second: the night sky is dark for a reason. If the universe were endless, unchanging and full of stars, every line of sight would end on a star and the whole sky would blaze. This puzzle is named for Heinrich Olbers, who wrote on it in 1823. The answer is that the universe has an age. Light from the farthest regions has not had time to arrive, and what does arrive from far away has been stretched out of sight. The darkness of night is evidence of a beginning.

Third: there is matter that gives no light at all. Galaxies turn as if they hold about five times more matter than their stars and gas can account for. It is called dark matter. The growth of the universe is speeding up, and the cause is called dark energy. Neither is "folded light". Dark matter neither gives out light nor takes it in, and nobody yet knows what either one is. That is honestly **open**.

Fourth: there are places light cannot leave. Around a black hole, space is so curved that light itself is held. In 2019 the Event Horizon Telescope, a network of radio dishes spanning the Earth, made the first picture of one. It shows a ring of light around a dark centre. The ring is light from hot gas, bent around the hole. The dark is the hole's shadow.

The torus

The reflection says light fields often take the shape of a torus. Ordinary light does not. But in 1996 two physicists, Hellwarth and Nouchi, found that Maxwell's equations allow a pulse of light shaped like a ring doughnut, with its fields wound around the ring. In 2022 a team in Southampton and their partners made such pulses and measured them. They are rare, difficult, and real.

What is seen

A black sky with points of light. A dark shape in the Milky Way.

What is unseen

Nearly everything. The warmth beyond red, the burn beyond violet, the first light of the universe in every direction, and the dust clouds that the Inca named, which are the places where new stars are forming.

The geometry beneath

The ring. A ring of light around a shadow in the picture of a black hole; a ring of aurora around each of the Earth's magnetic poles; a ring-shaped pulse on a laboratory bench. The torus is not the usual shape of light. It is the shape light takes when something bends it all the way around.

Claim or reading	Grade	What the evidence shows
Darkness is light folded back into itself	not supported	Darkness is the absence of light the eye can use
Most light is invisible to the eye	established	Herschel, 1800; Ritter, 1801; the whole spectrum
The night sky is dark because the universe has an age	established	The resolution of Olbers' puzzle

Claim or reading	Grade	What the evidence shows
Dark matter and dark energy are hidden light	not supported	They do not emit or absorb light; their nature is open
Light near a black hole is bent into a ring	established	Event Horizon Telescope, 2019
Light fields often take the shape of a torus	not supported as "often"	Toroidal pulses were first made in 2022
The Inca read figures in the dark of the Milky Way	established	Recorded in the colonial period and living today
The dark is where the next light is prepared	symbolic, with a true echo	Stars do form in the dark clouds

Near-truths

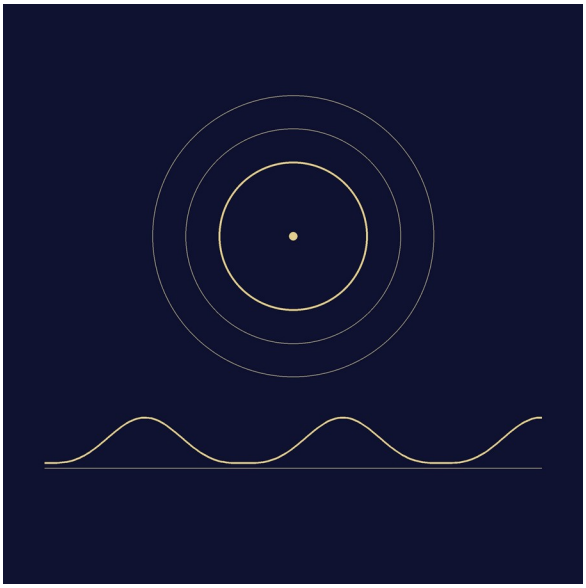
- Darkness is not light turned inward. It is light we cannot see, light that has not arrived, and, in a few places, light that cannot leave.
- The Inca did not treat the dark as empty. They read it. Science took until the twentieth century to learn that those dark lanes are nurseries of stars.
- The old teachers who spoke of a "dazzling darkness" were not doing physics. They were saying that what exceeds the eye looks, to the eye, like night.

> ✦ **Practice: Reading the Dark**
>
> On a clear night, away from lamps if you can, let your eyes rest on the sky for some minutes.
>
> Do not look for stars. Look at a dark place between them.
>
> Let ten easy breaths pass. The eyes will open further on their own.
>
> Notice what the dark begins to hold.
>
> Rest, and breathe normally.

PASS 11

Starlight: The Descent of Light

The eleventh pass falls under the Descent Moon. Its sign is the star.



Schematic. A pulsing star. Its size and brightness rise and fall together, in a steady rhythm of days.

The light

The reflection says each star is a breath node, exhaling light across time and space. This is a **symbolic** reading. But some stars do something for which "breathing" is the astronomers' own word.

The place

For the ancient Egyptians the year turned on one star. Sirius, the brightest in the sky, vanishes for about seventy days each year in the glare of the Sun. Its first reappearance at dawn, in high summer, came just before the Nile began to rise. They called the star Sopdet, and its return opened the year.

Half a world away the navigators of the Pacific crossed thousands of miles of open sea by the stars, without instruments. A star rises at the same point on the horizon all year. A trained navigator held in memory the rising and setting points of scores of stars, and steered by each in turn as it climbed. That art was nearly lost and has been revived in living memory.

What is known

A star is a ball of gas so massive that its own weight heats and squeezes its centre until atomic nuclei fuse. In the Sun, hydrogen is fused to helium, and about four million tonnes of matter become energy every second. That energy begins as light deep in the core. It cannot fly straight out. It is absorbed and sent out again in a random direction, countless times, and estimates of the time it takes to work its way to the surface run from many thousands to more than a hundred thousand years. From the surface it reaches the Earth in eight minutes and twenty seconds.

The heavier elements are made in stars and scattered when stars die. The carbon in a body, the oxygen in a breath and the iron in the blood were made that way. This was set out in a famous paper of 1957 and is **established**.

And some stars pulse. A class called Cepheid variables swell and shrink in a regular rhythm of days, growing brighter and dimmer as they do. In 1912 Henrietta Swan Leavitt, working at Harvard, found that the longer a Cepheid's period, the greater its true brightness. That gave astronomers a way to measure distances across space. With it, Edwin Hubble showed in the 1920s that there are other galaxies and that the universe is growing. The Sun also trembles, more gently, with a main rhythm of about five minutes.

What is seen

A point of light that twinkles. The twinkling is not in the star. It is our own air, moving.

What is unseen

The age of the light within the Sun. The pulse of the Cepheids, too slow for a glance. And the fact that we are made of what stars gave out.

The geometry beneath

The sphere, held between two forces: gravity pulling in and pressure pushing out. Where they balance, the star is steady. Where they overshoot each other in turn, the star pulses. The five-pointed star we draw is not in the sky. It is made by the eye and by the lens, which spread a bright point into rays.

Claim or reading	Grade	What the evidence shows
Stars shine by fusion	established	Twentieth-century physics
Sunlight reaches the Earth in about 8 minutes 20 seconds	established	Measured
Energy takes many thousands of years to leave the Sun's core	established in outline; the figure is an estimate	Models of the solar interior
The elements of life were made in stars	established	Burbidge, Burbidge, Fowler and Hoyle, 1957
Some stars pulse in a regular rhythm	established	Cepheid variables; Leavitt, 1912
The dawn rising of Sirius opened the Egyptian year	established	Egyptian calendars and texts
Each star is a breath node, exhaling light	symbolic	The reading of the reflection

Near-truths

- A star does not breathe as we do. But a pulsing star swells and settles in a steady rhythm, and that rhythm gave us the size of the universe.

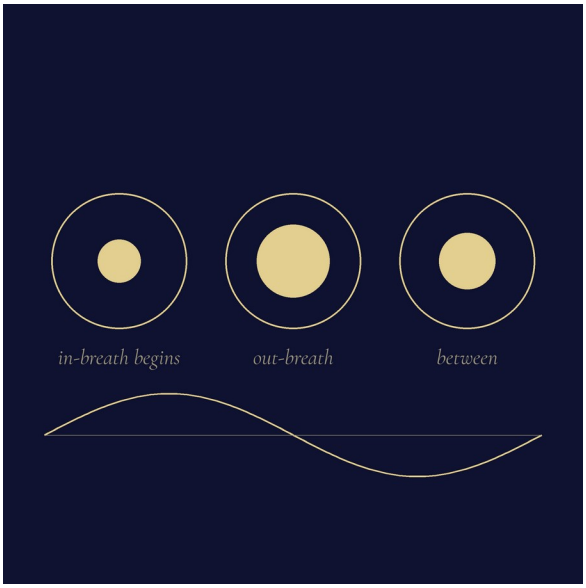
- The sunlight on your hand is eight minutes old on its last journey and ancient on its first.
- The star-path navigators did not carry a map. They carried the sky in memory, and it was enough.

> ✦ **Practice: Made of Stars**
>
> Sit quietly and rest a hand on your chest.
>
> On the in-breath, remember that the oxygen entering was made in a star.
>
> On the out-breath, remember that the carbon leaving was made in a star.
>
> No more than that, for seven easy breaths.
>
> Rest, and breathe normally.

PASS 12

Inner Light: The Eye, the Clock and the Luminous Mind

The twelfth pass falls under the Dream Moon. In the Codex its sign is OM: a sound that moves through three parts and returns to silence.



Schematic. The pupil over one breath. It is smallest as the in-breath begins and widest during the out-breath.

The light

The reflection says that human breath, when phase-locked in a pattern such as 13-8-13-8, can entrain with light fields. This pass weighs that claim and then turns to what is known about light inside a living person, which is a good deal.

The texts

The idea of a light within is one of the most widely shared in human thought. In the Brihadaranyaka Upanishad a king asks a sage what serves a person for light. The Sun, comes the answer. And when the Sun has set? The Moon. And when the Moon has set? Fire. And when the fire is out? Speech. And when all is silent? The self is then one's light. In the early Buddhist discourses there is a short saying that the mind is luminous, and is clouded by what comes to it from outside. The Gospel of John speaks of a light that shines in the darkness. The Society of Friends, the Quakers, built a way of worship on waiting in silence for an inward light.

None of these is a statement about photons. They are **beyond test**, and they are among the most considered things human beings have said.

What is known

The eye is astonishingly sensitive. An experiment of 2016 showed that a person in the dark can sometimes detect a single photon.

Light also sets the body's clock. Besides the cells for seeing, the retina holds a small set of cells, identified in 2002, that respond to blue light and report not to the seeing brain but to the clock that times sleep, waking, hormones and body heat. Morning light sets that clock earlier; bright light late at night pushes it later. The 2017 Nobel Prize in medicine was given for the workings of that clock.

Light affects mood. Bright light in the morning is an **established** treatment for the winter form of depression, though it is not a cure for all low moods. Blue light has been used since the 1950s to clear jaundice in newborn babies. Sunlight on the skin makes vitamin D.

Light and breath meet in the body in at least three ways. Bright light makes about one person in four sneeze. In 2025 a team at the Karolinska Institute showed, in five experiments with about two hundred people, that the pupil of the eye changes with the breath: it is smallest as the in-breath begins and widest during the out-breath. They suggest that sight may lean toward fine detail on the in-breath and toward faint things on the out-breath. And slow, easy breathing, around six breaths a minute, steadies the rhythm of the heart, which is well shown.

The claimed pattern

Thirteen and eight are neighbours in the Fibonacci series, and their ratio is close to the golden number. That is arithmetic and it is true. As a breath pattern, 13-8-13-8 means a thirteen-count in-breath, an eight-count hold, a thirteen-count out-breath and an eight-count hold. That is a cycle of over forty seconds with sixteen counts held. There is no evidence that it, or any pattern, "entrains with light fields". Long holds can cause dizziness and are unwise for many people. This study does not recommend it. The practice below keeps to the same family of numbers, five, eight and thirteen, and drops the holds.

What is seen

The outer world, by light.

What is unseen

That light is also telling the body what time it is. That the pupil breathes. And that in dreams we see a lit world with our eyes closed, in the dark, with no light entering at all.

The geometry beneath

The circle of the pupil, opening and closing; and the circle of the day, which the body follows by light.

Claim or reading	Grade	What the evidence shows
The eye can detect a single photon	established	Tinsley and others, 2016
Light sets the body's daily clock	established	Retinal clock cells, 2002; Nobel Prize, 2017
Morning bright light treats winter depression	established	Clinical trials since the 1980s
Pupil size follows the breath	established, recently	Schaefer and others, 2025

Claim or reading	Grade	What the evidence shows
A 13-8-13-8 breath entrains with light fields	not supported	No evidence; long holds are not advised
The mind is luminous by nature	beyond test	Held in several traditions
We see light in dreams with no light entering	established as experience	The brain makes the seen world

Near-truths

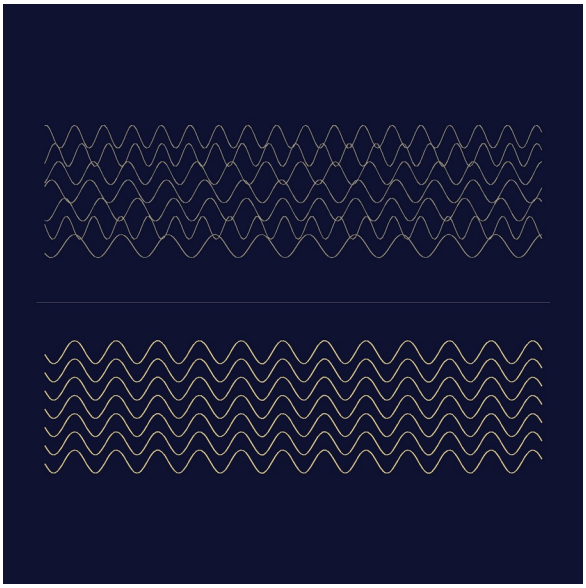
- The breath does not tune itself to light fields. But it does move the pupil, the opening through which all seen light must pass. Each breath changes, very slightly, how the world is lit for us.
- The inner light of the traditions is not the faint glow of Pass 8, and it would be a mistake to offer one as proof of the other.
- The plainest light practice is also the best supported: see the morning, and dim the night.

> ✦ **Practice: Thirteen and Eight, Without Holding**
>
> Sit comfortably with eyes closed.
>
> Breathe in gently to a slow count of five, and out to a slow count of eight. Do not hold at either end.
>
> After thirteen breaths, stop counting and let the breath go its own way.
>
> Notice the faint light behind the eyelids.
>
> Rest, and breathe normally.

PASS 13

Illumination: The Word, the Lamp and the Laser

The thirteenth pass falls under the Wisdom Moon, the crown. In the Codex its sign is the letter: a picture that became a sound, and that can die and return.



Schematic. Above, ordinary light: many waves out of step. Below, laser light: the waves in step, adding to one beam.

The light

In almost every language, to understand is to see, and to teach is to bring light. This pass asks what that old figure rests on, and finds that the modern world has made it literal.

The texts and the place

Plato, about 375 BC, compared the highest good to the Sun: as the Sun lets the eye see and also makes things grow, so the good lets the mind know and also gives things their being. In his story of the cave, people who have seen only shadows are led up into daylight and are at first blinded by it.

The Quran has a verse known as the Verse of Light. It likens the divine light to a niche in a wall, in which there is a lamp, and the lamp is within glass, and the glass is like a shining star, and it ends with the words "light upon light". Whole schools of thought grew from it. In twelfth-century Persia the philosopher Suhrawardi built a system in which everything that exists is a degree of light. The chief book of the Jewish mystical tradition, which appeared in Spain about 1280, is called the Zohar, which means radiance.

And on the Ganges stands a city whose oldest name is Kashi. The name is from a Sanskrit root meaning to shine. It is the city of light, and each autumn in India the festival of Diwali fills the darkest night of the month with small lamps.

What is known

In 1960 Theodore Maiman built the first laser. In ordinary light, from a flame or a lamp, countless atoms give out their waves at random, out of step with each other. In a laser the atoms are brought to give out their waves in step, each wave matching the one before. Physicists call light of this kind **coherent**. Because the small waves keep step and add together, a laser beam stays narrow over great distances and can carry a great deal of energy in a small space.

In 1966 Charles Kao showed that a thread of very pure glass could carry light for miles. Today the letters, voices and pictures of the world are turned into pulses of laser light and sent through such threads, under the streets and across the floors of the oceans. The great majority of what human beings say to one another at a distance now travels as light.

One more finding belongs at the crown. Two photons can be made together so that what is measured on one is tied to what is measured on the other, however far apart they are. It is called entanglement. It was confirmed in experiments from the 1970s on and honoured with the Nobel Prize in physics in 2022. It cannot be used to send a message faster than light, and it does not mean that minds are linked. It does mean that two can be described only as one.

What is seen

A page, a screen, a face on a call.

What is unseen

That the words reached us as light. And that the difference between a lamp and a laser is not more light. It is agreement.

The geometry beneath

Many waves, one line. In incoherent light the crests fall anywhere. In coherent light they fall together, and the sum is far greater than the parts. The letter of this Moon has come back as a pulse of light in a thread of glass.

Claim or reading	Grade	What the evidence shows
Light is the common figure for knowing	established as a fact about languages and scriptures	Plato, John, the Quran, the Upanishads, and many more
A laser gives coherent light: waves in step	established	Since 1960
Most long-distance human communication is carried by light in glass	established	Optical fibre since the 1970s
Entangled photons share one description	established	Experiments since the 1970s; Nobel Prize, 2022

Claim or reading	Grade	What the evidence shows
Entanglement links minds or sends thoughts	not supported	It carries no usable signal
All that exists is a degree of light	beyond test	Suhrawardi and others
The Codex's coherence has an exact parallel in optics	symbolic, with an exact parallel	Chapter 4

Near-truths

- "Coherence" is not only a Codex word. It is the name physics gives to waves that keep step, and it explains why a small light, in step with itself, can cross an ocean.
- The scriptures did not foresee the laser. But "light upon light" is a fair description of how one is made.
- The motto of this work is "In Harmony, Small Things Grow Towards Unity." A laser is that sentence carried out in glass and mirrors.

> ✦ **Practice: In Step**
>
> Sit with one other person, or with a ticking clock if you are alone.
>
> Let your breath be easy. Without forcing, let it begin to fall in with theirs, or with every fourth tick.
>
> Stay for thirteen breaths.
>
> Notice what changes when two rhythms keep step.
>
> Rest, and breathe normally.

CODA

The Fourteenth Pass: Return to the Point

After the thirteenth Moon the Codex Calendar keeps one day outside the count: the Breath Day. It belongs to no Moon. It is the pause in which the year turns.

Light has such a moment too. Every beam, however far it has travelled, ends at a point. A photon that left a galaxy thirteen billion years ago and crossed the whole depth of the sky is, at the last, taken in by a single molecule in a single cell at the back of one eye. All that distance and all that age become one small change in one place. The sphere that began at a point in Pass 1 closes on a point here.

Nothing needs to be done with this. Sit for a while where there is light. Let it arrive.

> ✦ **Practice: Receiving**
>
> Sit where daylight falls, with the Sun out of your view.
>
> Let the eyes rest half open on nothing in particular.
>
> For as many easy breaths as you like, do not look at anything. Let the light come to you.
>
> When you are ready, close your eyes and rest.

PART TWO

Patterns, Geometry and the Three Illuminations

CHAPTER 2

Seen and Unseen: The Patterns of the Thirteen Passes

The passes together

The thirteen passes can be laid side by side. In each there is something any eye can see, something that was hidden until it was measured, and a figure that holds the two together.

#	Moon	Seen	Unseen	Figure
1	Genesis	A beam in a dark chamber	The first light of the universe, still arriving	Point and sphere
2	Spiral	A straight beam	The twist a beam can carry	Line and helix
3	Vector	A shadow; a rainbow	The colours inside white	Triangle and cone
4	Mirror	The Moon	That its light is the Sun's, and ours	The equal angle
5	Stillness	Light arriving	A speed that never changes	The cross of two forces
6	Memory	A star	Its age and its chemistry	The ruled line
7	Return	Bands of light and dark	Darkness made of two lights	Overlapping circles
8	Release	A firefly	The glow of all breathing tissue	The loop
9	Echo	The world, upright	An upside-down picture in the eye	The vesica
10	Shadow	The dark of night	Most of the spectrum; the reason night is dark	The ring
11	Descent	A twinkling point	A pulsing star; ancient light	The balanced sphere
12	Dream	The lit world	A clock set by light; a pupil that breathes	The circle of the day
13	Wisdom	Words on a screen	Waves in step, carrying them	Many waves, one line

Four patterns

The unseen is the larger part. In every pass the hidden thing turned out to be bigger than the seen thing. One octave is visible; dozens are not. The Moon's borrowed light, the star's age, the upside-down picture, the reason the night is dark: none of these can be seen by looking, and all of them are true. The reflection

is right to give the unseen its own heading. It is wrong only in supposing that the unseen must be esoteric. Most of it is in the textbooks.

The old builders worked with straight light. Newgrange, the Sun Dagger, Abu Simbel, Chartres and, perhaps, El Castillo all do the same thing. They do not bend light or store it. They make a dark place and a narrow way, and they set these where the turning sky will send a beam through on a chosen day. Their knowledge was of time and angle. It was real, and it was hard won.

Light and breath meet in chemistry, not in resonance. The reflection looks for the meeting of breath and light in entrainment and phase. The passes found it somewhere plainer: in oxygen. Light frees oxygen from water in the green cell. Breath carries that oxygen to every cell of an animal. Living light is made with it, and the faint glow of the body is a trace of its use.

The sacred texts and the laboratory agree about experience and differ about mechanism. Where a hymn says that light came first, that life lives by the Sun, that there is a dark before the light, or that understanding is a kind of seeing, it is reporting something every person can confirm. Where a modern reader takes the hymn as physics, the reading fails. Keeping the two hands apart lets both be honoured.

CHAPTER 3

The Geometry Beneath: Three Figures Weighed

The reflection says the Codex of Light is built on three figures: the golden spiral, the vesica piscis and the torus. Each has now been met. Here they are weighed together, and set beside the figures that optics itself is built on.

The golden spiral

As physics: not supported. Light does not travel along a golden spiral, or any spiral, in empty space.

The near-truth: the helix. Light can turn about its own axis in two ways. Its electric force can rotate, which is circular polarisation, known since the nineteenth century. And its whole wavefront can be wound like a screw, which is twisted light, made since 1992. In both cases the figure is a helix of even pitch, not a spiral that widens by the golden ratio.

As symbol: the spiral remains the Codex's figure for growth that keeps its form. It can stand over the Spiral Moon honestly, so long as it is not said to be the path of a ray.

The vesica piscis

As physics: true in two exact senses. Where two sets of waves overlap, they draw a pattern of light and dark that neither holds alone (Pass 7). And the cross-section of a simple lens is the vesica itself (Pass 9). In the first sense two fields make order. In the second, two curves make focus.

What it does not do: it does not create light.

As symbol: this is the strongest of the three. The Codex reads the vesica as the place where two meet and a third appears. Interference is precisely that.

The torus

As physics: rare, but real. Ordinary beams are not toroidal. Ring-shaped pulses of light were predicted in 1996 and made in 2022. Light is bent into a ring around a black hole. The aurora forms a ring around each magnetic pole.

As symbol: the torus stands for a flow that returns through its own centre. The loop of oxygen and carbon between green life and breathing life (Pass 8) is a better home for it than the shape of a light beam.

The figures optics is built on

For completeness, these are the geometries that the science of light does rest on. Each has a Moon in this study.

Figure	What it governs	Where met
The straight line	The path of light in empty space	Passes 2 and 3

Figure	What it governs	Where met
The sphere	The spreading of light from a point	Pass 1
The equal angle	Reflection	Pass 4
The sine wave	The form of the wave itself	Passes 5 and 7
The right-angled cross	Electric force, magnetic force and direction	Pass 5
The cone	The rainbow; the reach of any light in time	Pass 3
The path of least time	Why light bends in water and glass	Pass 2

The last of these deserves a word. Fermat's rule says that light, going from one point to another, takes the path that needs the least time. It is as if the ray tried every way and kept the quickest. In the modern account, which Richard Feynman made vivid, that is very nearly what happens: the wave explores every path, and all but those near the quickest cancel one another out. The straight line is not a rule laid on light from outside. It is what is left when everything else has cancelled.

CHAPTER 4

The Three Illuminations

The first illumination: Every Breath Is Borrowed Light

There was a time when the Earth's air held almost no free oxygen. More than two billion years ago, small living cells in the sea began to use sunlight to split water, and oxygen was the waste they let go. Over a very long time it filled the oceans and then the air. Every animal that has ever breathed has breathed that gift, renewed each day by forests, grasses and the drifting green life of the sea, which makes about half of it.

So the tie between breath and light is not a likeness. It is a debt. The oxygen in the breath you are taking now was bound in water until light, falling on a green cell, set it free. The carbon dioxide you give back is what that cell needs to do it again. The loop turns once for each of us many thousands of times a day.

The reflection calls light "the breath of recursion made visible". Turned around, the sentence becomes something that can be shown: **breath is light made usable.** This is the first illumination, and it is graded **established**. Turning 10 marks its small and still-argued exceptions: the honest word is "nearly every".

Sit with it: For one day, each time you notice a green leaf, take one breath on purpose.

The second illumination: We See One Octave

A piano has a little over seven octaves and the ear hears about ten. The eye sees one. From the deepest red to the last violet, the frequency of light doubles once, and that is the whole of colour. On either side the spectrum runs on, for dozens of octaves, in forms the eye was never built to catch.

This does not make sight poor. One octave was enough for the whole of painting. But it does change the meaning of "unseen". The unseen is not a rare and secret layer behind the world. It is the ordinary condition of most of what is there. Herschel found the first of it with an ordinary thermometer.

The Codex speaks of the seen, the unseen and the soon to be seen. In the story of light the third of these has a clear record. Infrared in 1800, ultraviolet in 1801, radio waves in 1887, X-rays in 1895, the first light of the universe in 1964, a twisted beam in 1992, a ring-shaped pulse in 2022. None of it was hidden by anyone. It waited until somebody built a way to look.

This is the second illumination, and it is a lesson in two directions. It asks for humility about what we take to be the whole. And it asks for care about what we claim to see in the dark, because the unseen has turned out, again and again, to be specific, measurable and not what was expected.

Sit with it: What in my own life is plainly there, and outside the one octave I have been looking in?

The third illumination: Coherence Is Literal

The Codex uses the word coherence for a state in which the parts of a person, or of a group, move together. It has always been open to the charge that this is only a pleasant word.

Optics uses the same word, and there it has an exact meaning and an exact consequence. In a candle flame, each atom gives out its light when it will. The waves leave at random, out of step, and their

strengths merely add. In a laser, each atom is brought to release its wave in step with the wave that passes it. Nothing is added but agreement. The result is a beam that can be sent to the Moon and back, that can cut steel, and that carries nearly all the world's messages.

The photons in a laser beam are not forced. Each is released by the passing of another like itself, and it joins in step. No single one is brighter than a photon from a candle. What changes is the relation among them.

The motto of this whole body of work is *In Harmony, Small Things Grow Towards Unity*. A laser is that sentence, built. This is the third illumination. It is graded **symbolic, with an exact parallel**: the physics does not prove anything about human beings, but it shows, in the plainest material there is, that agreement among small things is a real source of power, and that it comes from relation and not from size.

Sit with it: Where am I adding effort, when what is missing is step?

CHAPTER 5

Where the Codex of Light Stands

Among the other works

The Codex stands on four pillars, each with its own site and study: time (the Codex Calendar), stone (Codex Crystals), sound (Codex Sounds) and symbol (the Codex of Symbols). The Monad Codex is the still centre they stand around.

Where does light belong? This study proposes that it is not a fifth pillar and not a second centre. **Light is the medium in which the four are seen.** A calendar is the reading of light and shadow across a year. A crystal is known by what it does to light. A symbol must be seen to be a symbol. Only sound does without it, and the thirteenth pass showed that our voices, too, now travel as light. On this proposal the Codex of Light does not add a member to the family. It is the room the family sits in.

This is the author's to decide, and it was marked here as **open** when this chapter was written. Chapter 15 walks the question through thirteen breaths and gives a fuller answer. This chapter is left as first written.

Each pillar, seen by light

Pillar	Its meeting with light	Pass
Time	Every calendar began as a watch kept on sunrise, shadow and Moon	1, 3, 4, 5
Stone	A crystal bends, splits and colours light; the first lenses and prisms were stones	3, 9
Sound	Sound and light are both waves; both have octaves; both can be coherent	7, 13
Symbol	A symbol is a shape that light carries to an eye	9, 13

What codexlight.com could be

The reflection asks that the site be a mirror, a portal and a living archive. On the evidence of this study, three things would serve those ends and stay honest.

- **The thirteen passes**, one page to a Moon, each with its two hands kept apart, as here.
- **A sky for today:** the time of sunrise and sunset for the visitor's place, the phase of the Moon, and which pass belongs to the current Moon of the Codex Calendar.
- **A page on the unseen:** the spectrum drawn to scale, with the one visible octave marked, and the year each other part was found.
- **A dark setting for evening**, as Pass 12 advises.

CHAPTER 6

Why Light Matters Now

We have changed the night

For all of history until about a hundred and fifty years ago, every human being lived under a dark sky. A study published in 2016 found that more than eighty percent of the world's people now live under skies brightened by artificial light, and that the Milky Way cannot be seen by about a third of humanity. The dark figures the Inca read, and the star paths the navigators steered by, are invisible from most of the places where people now live.

This is not only a loss of beauty. Pass 2 told how a lamp traps flying insects by confusing their sense of which way is up. Young sea turtles crawl toward lit streets and away from the sea. Migrating birds circle lit towers. And Pass 12 showed that the human body reads light as the time of day. Bright evenings tell the body it is not yet night.

We live by screens

The third illumination has a shadow. Coherent light carries our words through the glass threads. At the end of the thread is a screen, and the light of a screen is ordinary light, not coherent. It now reaches our eyes for many hours a day, and late into the evening. The research on what this does is still being gathered and should not be overstated. What is **established** is simple: light in the morning helps the body's clock, and bright light late at night works against it.

What the old places still teach

The builders of Newgrange waited a year for seventeen minutes of light. The measure of their knowledge is not that they had light, but that they knew when it would come and made a place to receive it. A Codex of Light, kept honestly, would teach the same three things: to notice light, to know its times, and to keep some darkness in which it can be seen.

An invitation

The reflection ends with a question: what is the hidden structure of light when viewed through the breath? This study's answer is in three parts. Through the breath, light is seen to be the far end of a loop of which breathing is the near end. It is seen to be mostly beyond our seeing, and none the worse for that. And it is seen, in its most concentrated form, to be many small things keeping step.

None of that requires light to be other than physics says it is. The wonder was not hiding behind the facts. It was in them.

PART THREE

Light Into Life · The Second Reflection in Thirteen Turnings

CHAPTER 7

The Second Reflection: Light, Energy and Matter

What the second reflection says

The first reflection asked what light is when it is seen. The author then added a second, and called it essential:

How do humans, coral, plants and other living things convert light to energy, and then to mass? We now know that everything is energy, moving at certain vibrational frequencies. We are made of atoms that are mostly empty and contain little matter.

This part walks that reflection through the same thirteen Moons. Part One called its steps passes, because light was passing by and being read. Here they are called turnings, because at each one light is turned into something else: a moving electron, a flow, a sugar, a reef, a body, and at the far end, a particle of matter.

Its claims, weighed in advance

The second reflection says	Grade	Where it is weighed
Plants convert light to energy	established	Turnings 1 to 6
Plants convert light to mass	not as usually meant; the mass is air and water, assembled by light	Turning 5
Coral converts light to energy	established for the partnership of coral and alga	Turning 7
Humans convert light to energy	not supported directly; we use light as signal and eat it second-hand	Turning 9
Everything is energy	a manner of speaking with an exact core	Turnings 11 and 12
Everything vibrates at certain frequencies	established in the language of physics; not supported as a personal "frequency"	Turning 12
Atoms are mostly empty	established in one sense, misleading in another	Turning 12
Light can become matter	established, in the laboratory since 1997 and directly since 2021	Turning 13

TURNING 1

The First Catch: One Photon, One Electron

The first turning falls under the Genesis Moon, in Iphi. Its sign is the point.

The turning

Before light can become anything, it has to be caught. Light that passes through a thing does nothing to it. Light that bounces off does nothing to it. Only light that is absorbed is turned.

What is known

In 1905 Einstein explained a puzzle called the photoelectric effect. Light falling on a metal knocks electrons out of it, but only if the light is of a high enough frequency, however bright it is. He showed that light arrives in packets, and that one packet gives its whole energy to one electron. It won him the Nobel Prize.

A leaf works on the same rule. A molecule of chlorophyll absorbs red and blue light and lets the green go by, which is why leaves are green. When it absorbs one photon, one of its electrons is lifted to a higher level. About three hundred chlorophyll molecules are gathered into an antenna around each working centre, and they pass the lifted energy from one to the next in a few millionths of a millionth of a second until it reaches the centre, where the electron is handed off before it can fall back.

It had long been assumed that one photon is enough to start this. In 2023 a team at Berkeley showed it directly, using a source that released one photon at a time. The test was made on the light-catching antenna of a purple bacterium, not on a leaf; the step is shared, and the result is taken to hold for plants.

In 2007 it was reported, from work on a bacterial complex, that this passing of energy through the antenna used a long-lived quantum effect, also called coherence, to find its way. Later work has largely withdrawn that claim. The energy does move with great efficiency, but for ordinary reasons. It is graded **contested, and mostly revised**.

Seen and unseen

Seen: a green leaf in sunlight. Unseen: that its greenness is the light it refused, and that everything it does begins with single electrons lifted by single photons.

The geometry beneath

The point. All of photosynthesis, and all of sight, begins at one molecule catching one photon.

Claim or reading	Grade	What the evidence shows
Light is absorbed one photon at a time	established	Einstein, 1905
A single photon can start photosynthesis	established	Li and others, 2023, in a purple bacterium

Claim or reading	Grade	What the evidence shows
Plants use long-lived quantum coherence to move energy	contested, mostly revised	Claimed 2007; reassessed by 2020
The first catch is the inhale of light	symbolic	The reading of this study

Near-truths

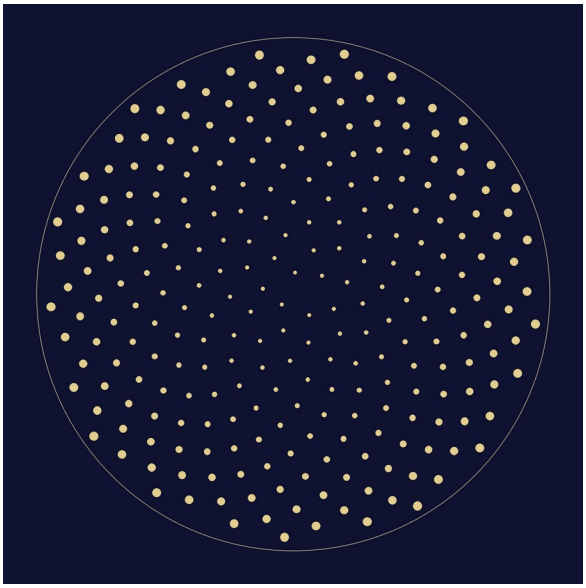
- Light has to be received to do anything. A leaf is green because green is what it lets pass.
- The scale of the beginning is always one: one photon, one electron.

> ✦ **Practice: What Is Caught**
>
> Look at a leaf in daylight for three easy breaths.
>
> The green you see is the light the leaf did not take.
>
> Rest, and breathe normally.

TURNING 2

The Leaf: A Spiral Made for Light

The second turning falls under the Spiral Moon, in Iphi. Its sign is the spiral.



Schematic. Seeds set one after another at the golden angle, about 137.5 degrees, fill a disc with no gaps and form spirals in both directions.

The turning

Part One found that light does not travel in a golden spiral. Here the golden spiral comes home. It is not the path of light. It is the way a plant arranges itself to catch light.

What is known

In the 1770s Joseph Priestley found that a candle would go out, and a mouse would die, in a sealed jar of air, and that a sprig of mint would restore the air so that both could live. In 1779 Jan Ingenhousz showed that the plant did this only in light, and only with its green parts. In 1845 Julius Robert Mayer, one of the founders of the law that energy is never lost, said what it meant: plants take in the energy of sunlight and store it in chemical form.

A plant has to place its leaves so that each shades the others as little as possible. Many plants do this by setting each new leaf at a fixed angle from the last, about 137.5 degrees, which divides the circle by the golden ratio. In a seed head the same rule gives the crossing spirals of a sunflower, which usually number two neighbours in the Fibonacci series, such as 34 and 55.

Seen and unseen

Seen: the spirals in a sunflower or a pine cone. Unseen: that they are not drawn by the plant at all. Each seed is simply set at the same angle from the one before, and the spirals appear.

The geometry beneath

The golden angle and the spirals it makes. This is **established** as a description of many plants, with exceptions.

Claim or reading	Grade	What the evidence shows
Plants restore air that breathing has spent	established	Priestley, 1771 to 1774
They do so only in light	established	Ingenhousz, 1779
Many plants set leaves and seeds at the golden angle	established, with exceptions	Counted in thousands of plants
The golden spiral is light's own shape	not supported	It is the plant's answer to light

Near-truths

- The golden spiral belongs to the catcher, not to the light.
- A whole pattern can come from one small rule kept faithfully. The Codex says the same of a life.

> ✦ **Practice: The Faithful Turn**
>
> With a pencil, place a dot. Turn the page a little more than a third of a circle and place another, slightly further out.
>
> Keep the same turn for thirteen dots, one to a breath.
>
> See what begins to appear.
>
> Rest, and breathe normally.

TURNING 3

Splitting Water: Where the Oxygen Comes From

The third turning falls under the Vector Moon, in Shema. Its sign is the triangle.

The turning

The electron that the leaf hands off must be replaced. The leaf takes its replacement from water, and in doing so it breaks water apart. This is the hardest step in all of biology, and it is where the oxygen we breathe is made.

What is known

For a long time it was thought that the oxygen plants give off came from carbon dioxide. In 1941 Samuel Ruben and Martin Kamen fed plants water made with a heavy form of oxygen and showed that the oxygen released comes from the water.

The work is done at a small cluster of four manganese atoms and one calcium atom, held in a protein. It takes four photons, one after another, to draw four electrons from two molecules of water. At the fourth step the two oxygen atoms join and are released as one molecule of oxygen gas. Bessel Kok worked out this four-beat cycle in 1970. The exact form of the cluster was seen in 2011. Since 2018, very short pulses from X-ray lasers have been used to photograph the cluster at each step, and in 2023 the steps leading up to the joining of the two oxygen atoms were caught. The joining itself has not yet been seen directly.

Life invented this once, in the ancestors of today's blue-green bacteria, more than two billion years ago. Every plant and alga since has inherited the same cluster.

Seen and unseen

Seen: bubbles on a water plant in sunlight. Unseen: that the oxygen was water a moment before, and that the same four-step device, unchanged, has been making it for over two billion years.

The geometry beneath

A cycle of four beats that ends where it began: four photons in, one oxygen out. The Codex breath has four phases as well. The likeness is one of number, and it is offered as **symbolic**.

Claim or reading	Grade	What the evidence shows
The oxygen from plants comes from water	established	Ruben and Kamen, 1941
Water is split in a four-step cycle at a manganese cluster	established	Kok, 1970; structure, 2011; X-ray movies to 2023
The cycle was invented once and inherited by all green life	established	Shared structure across all oxygen-making life

Claim or reading	Grade	What the evidence shows
The four steps are the four phases of breath	symbolic	A likeness of number

Near-truths

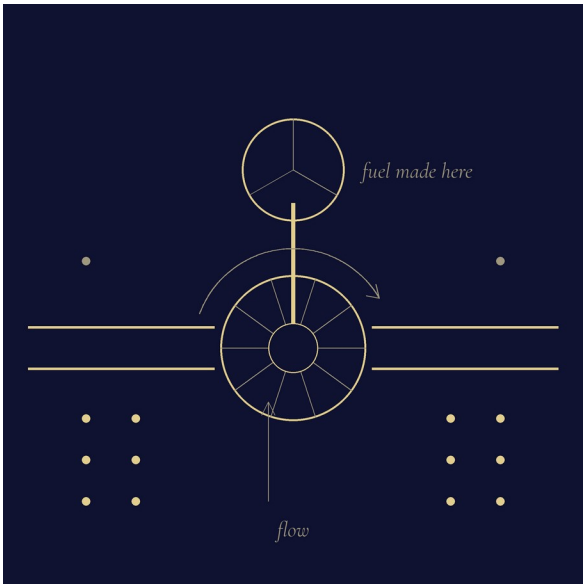
- Oxygen is what light leaves behind when it takes water apart.
- Our breath depends on a single invention, made once, by something too small to see.

> ✦ **Practice: Four Beats**
>
> Breathe in gently for a count of four, and out for a count of four, with no holding.
>
> After four rounds, let it go.
>
> Somewhere a leaf has just finished the same count.
>
> Rest, and breathe normally.

TURNING 4

The Two Engines: A Wheel in Every Cell

The fourth turning falls under the Mirror Moon, in Shema. Its sign is the square.



Schematic. A flow through a membrane turns a wheel, and the turning wheel makes the cell's fuel. The same wheel works in the green cell and in ours.

The turning

The leaf has caught light and split water. How does that become usable energy? The answer was so unexpected that its discoverer was doubted for years. It is also the place where the plant and the animal turn out to be mirror images.

What is known

In 1961 Peter Mitchell proposed that living cells do not make their fuel directly. They first pump charged particles across a thin membrane, building up a pressure like water behind a dam. Then they let the particles flow back through a tiny machine set in the membrane, and the flow drives the making of a fuel molecule called ATP. He received the Nobel Prize in 1978.

The machine is a wheel. Its form was worked out in the 1990s, and in 1997 a team in Japan fixed a fine filament to it and watched it spin under a microscope. It turns more than a hundred times a second.

The green cell uses light to build the pressure. Our own cells use the slow burning of food with oxygen to build it. After that the two are the same: the same pressure, the same wheel, the same fuel. A resting person makes and uses roughly their own body weight in ATP every day.

And both engines were once separate lives. In 1967 Lynn Margulis argued that the green bodies in plant cells and the power-bodies in all animal and plant cells are the descendants of free bacteria that came to live inside larger cells. It was resisted for a decade and is now **established**.

Seen and unseen

Seen: a leaf, and the hand that holds it. Unseen: that inside both, the same wheel is turning.

The geometry beneath

The wheel, and the mirror. The green engine runs from light and water to oxygen and sugar. Ours runs from sugar and oxygen to water and carbon dioxide. Each is the other reversed.

Claim or reading	Grade	What the evidence shows
Cells make fuel by a flow across a membrane	established	Mitchell, 1961
The fuel-making machine is a spinning wheel	established	Seen turning in 1997
A person turns over about their body weight in ATP daily	established as an estimate	Standard physiology
The engines of plant and animal cells were once free bacteria	established	Margulis, 1967, and the genetic evidence since

Near-truths

- The plant and the animal do not only exchange gases. They run the same engine in opposite directions.
- Every cell that uses light, and every cell that uses oxygen, is already a partnership of two lives.

> ✦ **Practice: The Wheel**
>
> Rest a hand on your belly and breathe easily for seven breaths.
>
> In every cell beneath your hand, wheels are turning on the breath you just took.
>
> Rest, and breathe normally.

TURNING 5

A Tree Is Made of Air

The fifth turning falls under the Stillness Moon, in Vara. Its sign is the cross.

The turning

The second reflection asks how light is converted to mass. This turning gives the plain answer, which is not the expected one.

What is known

About 1640 Jan Baptist van Helmont planted a willow weighing five pounds in a tub of weighed, dried earth. For five years he gave it only water. The tree grew to 169 pounds. The earth had lost about two ounces. He concluded that the tree was made of water. He was half right.

In 1804 Nicolas-Théodore de Saussure showed that a plant's gain in weight comes from water and from carbon dioxide taken out of the air. About half the dry weight of a tree is carbon, and every atom of it came in through the leaves as gas.

So where is the light? Not in the mass. The energy of the sunlight is stored in the bonds that hold the carbon together. By Einstein's equation that stored energy does have weight, but it is almost nothing. All the sunlight stored in two pounds of dry wood weighs about a fifth of a millionth of a gram.

Seen and unseen

Seen: the trunk of a tree, as solid a thing as we know. Unseen: that it is made of air and water, and that light was the builder and not the brick.

The geometry beneath

The cross of this Moon is the tree itself: root and crown, earth and sky. What crosses at the leaf is light coming down and carbon coming in.

Claim or reading	Grade	What the evidence shows
A tree's substance comes mostly from air and water	established	Van Helmont; de Saussure, 1804
Plants convert light into mass	not as usually meant	The mass is carbon, hydrogen and oxygen from air and water
The stored light itself has weight	established, and immeasurably small	Einstein, 1905
A tree is light made solid	symbolic	Light assembles it; it is not made of light

Near-truths

- A tree is not light turned into matter. It is air turned into wood by light.
- Burn the wood and the air is given back, and the light with it. The flame is the old sunlight leaving.

> ✦ **Practice: Breathing with a Tree**
>
> Stand near a tree. Breathe out slowly toward it.
>
> Some of what you give, it will keep, and build with.
>
> Stay for seven breaths.
>
> Rest, and breathe normally.

TURNING 6

Stored Sunlight: The Food and the Fire

The sixth turning falls under the Memory Moon, in Vara. Its sign is the ankh, life given.

The turning

Once light is stored in sugar, it can be kept, passed on and spent. This is how the whole living world is fed.

What is known

Green life on land and in the sea fixes roughly a hundred billion tonnes of carbon each year, about half of it in the oceans. Of the sunlight that falls on a field, a crop stores about one or two parts in a hundred. Everything that eats, eats that store, directly or by way of something else that did. Each step up the chain passes on about a tenth of what it received.

Coal, oil and gas are the same store, laid down over hundreds of millions of years. One careful estimate found that the fossil fuel burned in a single year at the end of the last century took about four hundred years of the whole planet's plant growth to lay down.

Seen and unseen

Seen: a loaf of bread, a log on a fire. Unseen: that both are sunlight in keeping, and that the warmth of your own body at this moment is the Sun's.

The geometry beneath

A chain, each link shorter than the last. And behind it, a single source.

Claim or reading	Grade	What the evidence shows
Almost all food energy began as sunlight	established	The food chain; see Turning 10 for the exceptions
Crops store about one to two percent of the light that falls on them	established	Measured in fields
Fossil fuels are ancient stored sunlight	established	Geology
Stored light is memory	symbolic	It is energy in keeping, released on demand

Near-truths

- You have never eaten anything that was not, at one or two removes, a meal of light.
- Fossil fuel is not only carbon in the wrong place. It is ancient summers, spent in an afternoon.

✦ **Practice: Grace**

Before one meal today, pause for a single easy breath.

Trace the food back, in your mind, to a leaf in the Sun.

Then eat.

TURNING 7

The Coral: Two Lives and a City of Stone

The seventh turning falls under the Return Moon, in Ouon. Its sign is the serpent.

The turning

The second reflection names coral, and it is well chosen. A reef is the largest thing that light has built with living hands.

What is known

A coral is an animal, a small soft polyp related to the jellyfish. It cannot use light. But inside its cells live single-celled algae that can. The algae make sugars by photosynthesis and pass most of them to the coral, often more than nine parts in ten of what the coral needs. The coral gives the algae shelter, carbon dioxide and the waste they use as food.

With that energy the coral lays down a skeleton of limestone, drawn from the seawater. It builds faster in the light than in the dark, which has been known since the 1950s. Over thousands of years the skeletons become reefs. Reefs cover less than a hundredth of the sea floor and shelter about a quarter of all the kinds of life in the sea. The largest runs for 1,400 miles along the coast of Australia.

The partnership is fragile. When the water stays too warm, the algae are lost, and the coral turns white and may starve. From early 2023 to the middle of 2025 the world's reefs passed through the fourth and most widespread such event on record. Heat severe enough to cause bleaching reached 84 percent of the world's reef area. In the first such event, in 1998, the figure was 21 percent.

Seen and unseen

Seen: a reef of stone and colour. Unseen: that it is built by an animal that cannot use light and a plant that cannot build, and that the stone is sunlight's work.

The geometry beneath

The branch, repeated. And beneath it, two circles that overlap: the vesica once more.

Claim or reading	Grade	What the evidence shows
Coral converts light to energy	established for the partnership	The alga catches light; the coral is fed
Corals build their skeletons faster in light	established	Since the 1950s
Reefs hold about a quarter of marine species	established as an estimate	Surveys
Bleaching-level heat reached 84 percent of reef area in 2023 to 2025	established	NOAA Coral Reef Watch

Claim or reading	Grade	What the evidence shows
A reef is two that stayed whole and made a third	symbolic, and exact	The coral, the alga, the reef

Near-truths

- Neither partner makes a reef. The reef is the third thing.
- What warms the sea is the burning of the stored light of Turning 6. One work of light is undoing another.

> ✦ **Practice: The Third**
>
> Bring to mind one thing you have made with another person that neither could have made alone.
>
> Hold it in mind for five easy breaths.
>
> Rest, and breathe normally.

TURNING 8

Other Catchers: The Many Ways of Taking Light

The eighth turning falls under the Release Moon, in Ouon. Its sign is the labyrinth.

The turning

Chlorophyll is not the only way. Life, and now people, have found others.

What is known

A second kind of light-catching. Some salt-loving microbes hold a purple protein that uses light to pump charged particles across a membrane, with no chlorophyll at all. It was found in 1971. In 2000 a related protein was found in ocean bacteria, and it has since turned out to be common across the sunlit sea. The part that catches the light is a small molecule called retinal, made from vitamin A. Keep that name in mind for Turning 9.

Borrowers. A green sea slug of the American east coast eats algae, keeps their light-catching bodies alive inside its own cells, and lives on them for months. The eggs of the spotted salamander carry algae inside the cells of the growing embryo. These are **established**. Claims that a hornet and an aphid harvest light with their own pigments are **contested**.

Beyond visible light. Dark, melanin-rich fungi were found growing inside the ruined reactor at Chernobyl. Experiments in 2007 suggested that they grow faster under radiation. Whether they truly live on it is **open**.

Made by hand. In 1839 Edmond Becquerel found that light on certain materials produces an electric current. In 1954 the first practical silicon solar cell was made. The best cells now turn more than thirty parts in a hundred of sunlight into electricity, against the one or two of a leaf. But a solar cell does not grow, mend itself or make more of its kind.

Seen and unseen

Seen: a solar panel on a roof. Unseen: that the sea is full of creatures doing a version of the same thing with a molecule related to the one in your eye.

The geometry beneath

Many paths to one centre: the labyrinth of this Moon. Each path ends with a charge moved across a boundary.

Claim or reading	Grade	What the evidence shows
Some microbes harvest light with retinal, not chlorophyll	established	Found 1971; found in the oceans, 2000
A sea slug lives on stolen chloroplasts	established	Observed for months

Claim or reading	Grade	What the evidence shows
Hornets and aphids harvest light	contested	Single studies
Some fungi feed on radiation	open	Suggestive experiments, 2007
Solar cells exceed thirty percent in the laboratory	established	Published records

Near-truths

- Light is taken in more ways than green. Every one of them ends by moving a charge across a boundary.
- Our best machines beat the leaf at catching and lose to it at everything else.

> ✦ **Practice: Warmth**
>
> Stand in daylight with your back to the Sun for five easy breaths.
>
> Feel the warmth on your shoulders. That is light being taken in, the simplest way there is.
>
> Rest, and breathe normally.

TURNING 9

The Human and the Light

The ninth turning falls under the Echo Moon. Its sign is the vesica.

The turning

The second reflection asks how humans convert light to energy. The honest answer is that we do not, in the way a plant does. What we do with light is different, and no less remarkable.

What is known

We are fed second-hand. A human body has no means of making food from light. All our energy comes from what we eat, which is the stored light of Turning 6. Claims that people can live on sunlight alone are **not supported**, and people have died trying. Staring at the Sun damages the eye.

Light makes a vitamin in the skin. Ultraviolet light on the skin changes a form of cholesterol into vitamin D. This is light doing chemistry in a human body, and it is **established**. Chapter 9 follows it step by step, with the other things the skin makes of light.

Light is our chief signal. In the eye, the molecule that catches light is retinal, the same small molecule that the ocean microbes of Turning 8 use to gather energy. When it absorbs a photon it changes shape, in about two tenths of a millionth of a millionth of a second, one of the fastest events known in living things. That change is the first step of all seeing.

Newer claims. Red and near-infrared light, shone on tissue, is under study for its effects on the energy-making bodies in cells. A few medical uses are accepted. Most of the larger claims are **contested**. A 2014 report that animals fed a chlorophyll product could make more ATP in light has not been confirmed and is **contested**.

Seen and unseen

Seen: daylight on the skin. Unseen: that the molecule we see with and the molecule a sea microbe feeds with are close kin.

The geometry beneath

The vesica, as in Pass 9: the lens of the eye, where the light for seeing is gathered.

Claim or reading	Grade	What the evidence shows
Humans convert light to energy as plants do	not supported	We have no such machinery
People can live on light alone	not supported, and dangerous	No verified case; deaths recorded
Sunlight on skin makes vitamin D	established	Biochemistry

Claim or reading	Grade	What the evidence shows
Seeing begins with retinal changing shape	established	Measured
Red light improves the cell's energy supply	contested	Some accepted uses; many unproven claims
Seeing and feeding on light share one root molecule	established	Retinal, in eye and microbe alike

Near-truths

- We do not eat light. We read it. But the reading and the eating began, long ago, with the same molecule.
- A person is not a failed plant. We are what light becomes when it is used to know instead of to grow.

> ✦ **Practice: Morning Light**
>
> In the morning, stand outdoors or at an open window for some minutes. Never look at the Sun.
>
> Let the light reach your face and your open eyes, indirectly.
>
> Breathe easily. Your body is setting its clock.
>
> Rest, and breathe normally.

TURNING 10

Life Without Light: An Honest Shadow

The tenth turning falls under the Shadow Moon. Its sign is the torus.

The turning

Is all life fed by light? Nearly. This turning marks the exceptions, because a Codex of Light should know its own edge.

What is known

In 1977 a research submarine exploring the sea floor near the Galápagos Islands, a mile and a half down, found hot springs crowded with life: giant tube worms, clams, shrimp. No sunlight reaches there. The base of that food chain is bacteria that take their energy from chemicals in the hot water, such as hydrogen sulphide. The tube worms keep these bacteria inside their bodies and have no mouth or gut of their own.

Deep in the rock, miles down, there are microbes that live on hydrogen made when natural radioactivity splits water.

Even so, light reaches most of these places by another road. The animals at the hot springs breathe oxygen dissolved in the sea, and that oxygen was made by light at the surface.

In 2024 a study reported oxygen being made on the dark sea floor of the Pacific, without light, around metal-rich lumps of rock. It drew wide attention. Other scientists have since challenged both the measurements and the proposed cause, and the question is **contested**.

Seen and unseen

Seen: nothing; these places are in total darkness. Unseen: whole living worlds that do not begin with a photon, and yet still lean, for their breath, on those that do.

The geometry beneath

The ring of the torus: a flow that seems apart and returns through the centre. The vent animals live without light, on oxygen that light made.

Claim or reading	Grade	What the evidence shows
Some life is fed by chemistry, not light	established	Hot-spring communities, found 1977
Their animals still depend on oxygen made by light	established	Ocean chemistry
Oxygen is made in the dark on the deep sea floor	contested	Reported 2024; strongly challenged since

Claim or reading	Grade	What the evidence shows
All breath is borrowed light	established for nearly all; see above	The first illumination, with its limit marked

Near-truths

- Not every living thing begins with light. But almost every breath does.
- The first illumination of this study said "every breath". The honest word is "nearly every", and the exception is still being argued on the sea floor.

> ✦ **Practice: The Edge**
>
> Sit in a darkened room for ten easy breaths.
>
> You are still breathing oxygen that light set free.
>
> Rest, and breathe normally.

TURNING 11

Mass Is Energy Held

The eleventh turning falls under the Descent Moon. Its sign is the star.

The turning

The second reflection says that everything is energy. This turning finds the exact core of that saying.

What is known

In 1905 Einstein showed that mass and energy are two measures of one thing, joined by the square of the speed of light. A very little mass is a very great deal of energy.

The Sun shows it one way. It turns about four million tonnes of its mass into light every second. Of that, about two kilograms' worth, some four and a half pounds, falls on the Earth each second, and the Earth sends the same amount back out to space, about a third as reflected light and the rest as invisible warmth.

The atom shows it the other way, and this is the surprise. The centre of an atom is made of protons and neutrons, and each of those is made of three smaller particles called quarks. If you add up the mass of the three quarks, you get about one part in a hundred of the mass of the proton. The rest, about ninety-nine parts in a hundred, is the energy of the quarks' motion and of the force that binds them. This was confirmed by very large computer calculations published in 2008. The remaining one percent, the mass of the quarks themselves, comes from their meeting with a field that fills all space, whose particle, the Higgs, was found in 2012.

Seen and unseen

Seen: your own weight on a scale. Unseen: that nearly all of it is not "stuff" at all. It is energy, held in a very small space.

The geometry beneath

The sphere held in balance, as with the star in Pass 11. A proton is energy that cannot get out.

Claim or reading	Grade	What the evidence shows
Mass and energy are equivalent	established	Einstein, 1905; every nuclear measurement
The Sun turns about four million tonnes of mass to light each second	established	Solar physics
About 99 percent of ordinary mass is binding energy	established	Calculations confirmed in 2008
Everything is energy	a manner of speaking with an exact core	Energy is a measure, not a substance; but mass is energy held

Near-truths

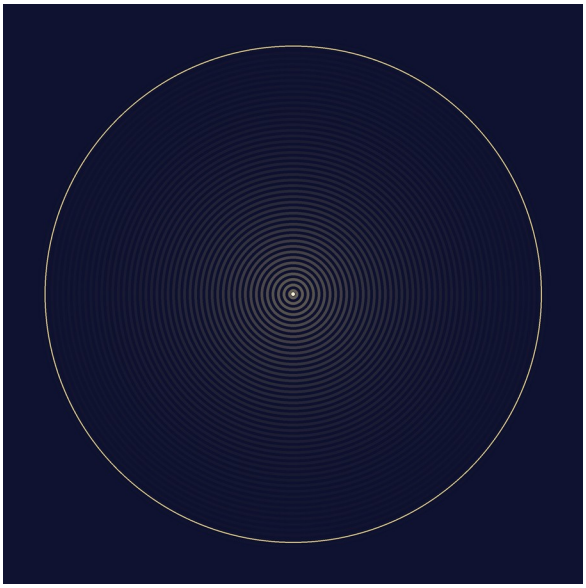
- "Everything is energy" is loose. "Almost all your weight is energy held in place" is exact.
- That held energy is not light. But it was light's speed, squared, that told us how much there is.

> ✦ **Practice: Weight**
>
> Sit, and feel your weight on the seat for five easy breaths.
>
> Nearly all of that weight is motion, held still.
>
> Rest, and breathe normally.

TURNING 12

The Empty Atom and the Vibrating World

The twelfth turning falls under the Dream Moon. Its sign is OM.



Schematic, not to scale. If the atom were the size of this circle, its nucleus would be far smaller than the central dot. The space between is filled by the electron as a cloud.

The turning

Two sayings of the second reflection are weighed here: that atoms are mostly empty, and that everything vibrates at certain frequencies.

What is known

The empty atom. In 1909 Hans Geiger and Ernest Marsden, working under Ernest Rutherford, fired tiny particles at a sheet of gold leaf. Nearly all went straight through. About one in eight thousand bounced back. Rutherford said it was as if a shell fired at tissue paper had come back and hit you. He concluded in 1911 that an atom's mass sits in a centre about a hundred thousand times smaller across than the atom itself. If the nucleus were a pea, the atom would be the size of a sports stadium.

In that sense the atom is mostly empty. But the space is not nothing. The atom's electrons are not small balls circling far off. Each is spread through the whole atom as a cloud. And what makes a table solid is not that atoms are full. It is a rule, found by Wolfgang Pauli in 1925, that forbids two electrons from being in the same state, so that atoms cannot be pushed into one another. Solidity is a refusal, not a filling.

The vibrating world. In the best theory physics has, every kind of particle is a ripple in a field that fills all space: an electron is a ripple in the electron field, a photon a ripple in the field of light. And every particle has a frequency tied to its energy; Louis de Broglie proposed it in 1924 and it has been measured ever since. So the saying that everything is vibration has a strict meaning in physics, and in that meaning it is **established**.

What is **not supported** is the further step, often taken, that each person, mood or illness has a "frequency" that can be raised or tuned. That is a figure of speech borrowed from physics, not a finding of it.

Seen and unseen

Seen: a solid world. Unseen: that the solidity is made of fields in motion, keeping out of one another's way.

The geometry beneath

The cloud and the centre. And the wave, again: OM, a sound that is all vibration and returns to silence.

Claim or reading	Grade	What the evidence shows
The atom's mass is in a centre a hundred thousand times smaller than the atom	established	Rutherford, 1911
Atoms are mostly empty	established in one sense, misleading in another	The electron cloud fills the atom
Solidity comes from a rule of exclusion	established	Pauli, 1925
Particles are vibrations of fields	established as the working theory	Quantum field theory
Each person has a vibrational frequency that can be raised	not supported	A figure of speech

Near-truths

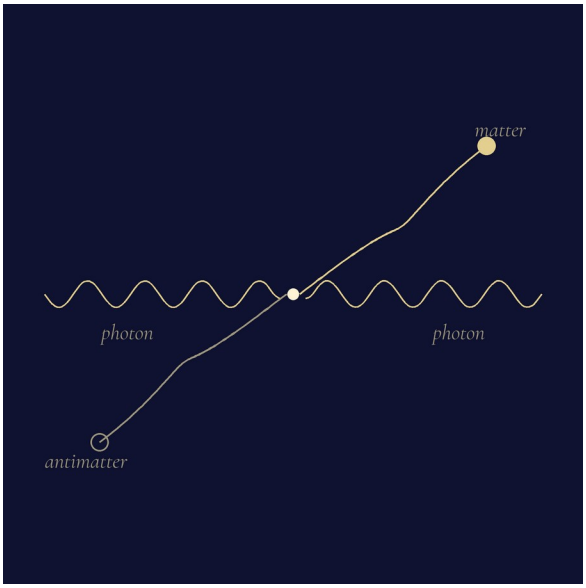
- We are not mostly nothing. We are mostly relation: fields holding their places with respect to one another.
- The world is vibration in the physicist's sense. That gives no licence to sell anyone a higher frequency.

> ✦ **Practice: The Hum**
>
> With lips closed, hum gently on one easy out-breath. Do not push.
>
> Feel the vibration in the chest and face.
>
> Let it fade into silence, and rest.

TURNING 13

Light Into Matter

The thirteenth turning falls under the Wisdom Moon, the crown. Its sign is the letter.



Schematic. Two photons meet. In their place there is a pair: one particle of matter and one of antimatter.

The turning

Can light itself become matter? Not in a leaf. But yes.

What is known

In 1932 Carl Anderson, studying rays from space, found a particle like the electron but with the opposite charge. It was the first antimatter seen. The next year it was shown that a single very energetic photon, passing close to an atom's nucleus, can vanish and leave in its place an electron and its antimatter twin. Light had become matter.

In 1934 Gregory Breit and John Wheeler worked out that two photons, meeting each other with enough energy, should do the same with no nucleus needed. They thought it could never be tested. In 1997, at Stanford, a first version of it was achieved using an intense laser. In 2021 a team at Brookhaven National Laboratory reported the process directly, from the light that surrounds gold nuclei moving at nearly the speed of light, and counted more than six thousand pairs.

The reverse happens every day. In a hospital PET scanner, matter and antimatter meet inside the body and become two photons, and the machine builds its picture from them.

On the largest scale, cosmology holds that in its first moments the universe was filled with radiation so hot that particles and light changed into one another continually. As it cooled, a small surplus of matter was left. Everything solid is that remainder. Why there was a surplus at all is **open**.

Seen and unseen

Seen: nothing; this happens far below sight. Unseen: that matter and light are not two kinds of thing. Each can become the other, and the exchange rate has been known since 1905.

The geometry beneath

Two meeting, and a pair arising. It is the simplest picture in this book, and the Codex has drawn it from the beginning.

Claim or reading	Grade	What the evidence shows
A photon can become a pair of particles near a nucleus	established	Since 1933
Two photons can become matter	established	Predicted 1934; achieved 1997; shown directly 2021
Matter and antimatter become light	established	Used daily in medicine
All matter was once in exchange with radiation	established cosmology	The surplus of matter is unexplained
Light is the source of matter	symbolic, with an exact core	They are interchangeable; neither is simply first

Near-truths

- The second reflection asked whether light becomes mass. In a tree, no. Between two photons, yes.
- Two that meet make a third. In 2021 it was counted.

> ✦ **Practice: Two Hands**
>
> Bring your two palms slowly together on an out-breath, until they touch.
>
> Feel the warmth between them for three easy breaths.
>
> Open them on an in-breath.
>
> Rest, and breathe normally.

PART FOUR

Light at the Boundary · The Skin, Every Surface, and the Third That Is Made There

CHAPTER 8

The Third Reflection: The Skin, the Surface and the Boundary

The reflection

After the thirteen turnings the author asked for one more descent. Go deeper, he said, into sunlight on human skin: how it makes vitamin D, and possibly vitamin E. Then look at how every surface takes in light and makes a third thing of it. And he gave the reason in one line: when two meet at a boundary, a third is produced.

This Part weighs that in three chapters. The skin comes first, because it is the one boundary each reader wears. Then every surface. Then the boundary itself.

Claim in the reflection	Grade	Where it is weighed
Sunlight on skin makes vitamin D	established	Chapter 9
Sunlight on skin makes vitamin E	not supported; the truth is the reverse, and better	Chapter 9
There is more in the skin than vitamin D	established	Chapter 9
Every surface absorbs light and makes something of it	established	Chapter 10
When two meet at a boundary a third is produced	established in optics; symbolic as a law of everything	Chapter 11

CHAPTER 9

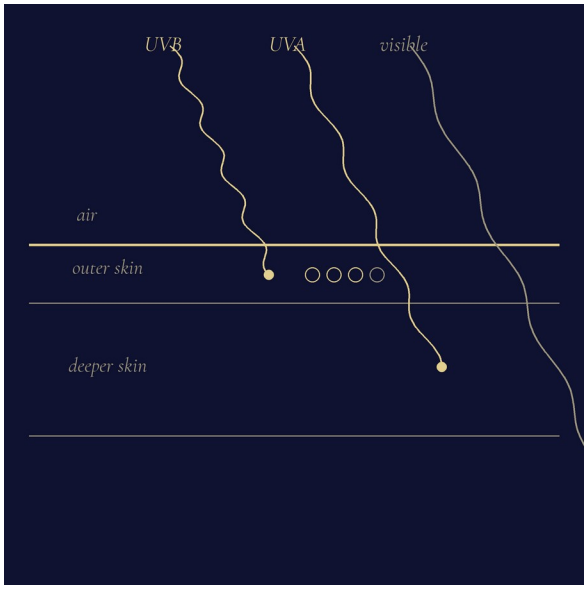
The Skin: Where Sunlight Becomes a Messenger

Two steps, one of light and one of warmth

In the membranes of the living cells of the outer skin there waits a close relative of cholesterol. Its working name is 7-dehydrocholesterol. Call it the waiting molecule.

It is built of four rings of carbon. One narrow band of sunlight, the ultraviolet called UVB, carries exactly the energy that this molecule absorbs best. That band is less than a twentieth of the ultraviolet that reaches the ground. When one photon of it is absorbed, one of the four rings breaks open. The result is a new molecule, previtamin D.

Then light's part is over, and the body's begins. Previtamin D is not yet the vitamin. Over the following hours and days, the plain warmth of the skin lets the opened molecule fold itself into its final shape, vitamin D. So the making takes two steps and two givers: **a photon to open the ring, and the body's own warmth to finish it**. Neither can do the other's part.



Schematic. The skin as a boundary. The short ultraviolet (UVB) is stopped in the thin outer layer, where it opens the waiting molecule. The longer ultraviolet (UVA) and visible light go deeper.

The skin cannot be overfilled

There is a second thing of beauty here. If sunlight goes on falling, the previtamin itself absorbs it and is turned into two side-products that do not act as vitamin D. (Whether they have quiet work of their own is under study, and **open**.) Vitamin D already made is broken down the same way. The skin reaches a balance at which only about a tenth to a seventh of the waiting molecule is converted, however long the exposure. **No case of vitamin D poisoning from sunlight is known.** Poisoning comes from the bottle. The Sun's gift has a brim built in. The burn has none: skin goes on burning long after it has stopped making vitamin.

From vitamin to messenger

The new molecule leaves the skin in the blood. The liver changes it once, the kidney changes it again, and what results is not a vitamin at all in the strict sense. It is a hormone, a messenger, and nearly every tissue of the body carries the receptor that reads it. Its first and proven work is to let the gut take up calcium, which is why a child without it grows soft and bent bones.

So the full path is this: a photon that left the Sun eight minutes ago opens a ring in the skin; warmth finishes it; two organs refine it; and the message that arrives in the bone says, in effect, *build*. Light has become an instruction.

How it was found

- **1822.** Jędrzej Śniadecki, in Poland, notes that the bone disease rickets is common among city children and rare in the country, and advises sunlight.
- **1919.** Kurt Huldschinsky, in Berlin, cures children of rickets with a mercury lamp. Light on one arm heals the other arm too, so something is carried in the blood.
- **1924.** Harry Steenbock and Alfred Hess show that food exposed to ultraviolet gains the power to cure rickets.
- **1928.** Adolf Windaus receives the Nobel Prize for the chemistry of the sterols that become the vitamin.
- **1980 and 1982.** Michael Holick and colleagues find previtamin D in human skin and measure which wavelengths make it. The peak is close to 297 billionths of a metre.
- **1988.** The "vitamin D winter" is measured. In Boston, from November to February, the Sun is too low for any to be made.

What changes the making

Latitude and season. The UVB band is the first to be lost when sunlight crosses the air at a slant. Far from the equator, winter sunlight makes none.

The hour. For the same reason, the making is strongest near midday, which is also when burning is quickest.

The skin's own shade. Melanin, the dark pigment, absorbs the same band. Darker skin needs longer in the same Sun. The spread of human skin colours across the Earth is read by many researchers as a balance struck over thousands of generations, between protection where the Sun is fierce and vitamin-making where it is weak. That reading is **well supported, and still discussed**.

Age. Older skin holds much less of the waiting molecule.

Glass. Window glass stops the UVB band. Sun through a window warms, and makes no vitamin D.

A mushroom does a version of the same thing. Left in the Sun, it turns its own sterol into a form of vitamin D. The chemistry is far older than skin.

What vitamin D does, and what has been claimed for it

Here the two hands are needed, because a great deal has been claimed.

Established: it is needed for bone, and a real lack of it causes rickets in children and soft bones in adults.

Tested and not borne out: that extra vitamin D, given to healthy adults who are not short of it, prevents broken bones, cancer or heart disease. A large American trial of nearly twenty-six thousand people, reported from 2019 to 2022, found no fewer fractures in those who took it. In 2024 the Endocrine Society advised that healthy adults under seventy-five need no more than the ordinary recommended amount, and need no routine testing.

One result that stands out: in that same trial, those who took vitamin D for five years had about a fifth fewer new cases of autoimmune disease. It is one trial, and the grade is **promising, not yet settled**.

So the vitamin is real, the lack of it is real, and "more is better" is **not supported**.

Vitamin E: the reflection reversed

The reflection asks whether sunlight on skin also makes vitamin E. It does not, and the grade is **not supported**. No animal can make vitamin E, in light or in the dark. What is true is stranger and suits the Codex better.

Vitamin E is made by plants, inside the green bodies where they catch light. They make it to protect their own light-catching membranes from the damage that light does. It is a shield made by light-catchers, against light.

We take it in with food. The body carries it to the skin in the skin's own oil, where it sits in the outermost layer. And there sunlight spends it. In a 1998 study under a sun-lamp, a single dose too small to redden the skin used up nearly half of the vitamin E in the outermost layer. In a small 2004 study from a skin-care laboratory, half an hour of real midday Sun used up a half to two thirds of the vitamin E at the skin's surface.

So the two vitamins stand opposite one another at the same boundary:

	Vitamin D	Vitamin E
Where it is made	In human skin	In the green leaf
What light does to it	Makes it	Spends it
What it is	A message: *build*	A shield: *protect*
What it shows	Light received	The cost of receiving

Every receiving of light has a price, and life pays it with something that light itself helped to make. That sentence is the honest form of the reflection's guess, and it is graded **established** in its parts and **symbolic** as a whole.

There is more: what else the skin makes of light

The reflection says, "There is more here." There is.

A gas that eases the blood vessels. The skin holds a large store of nitrogen compounds. The longer ultraviolet, UVA, releases from them a small gas, nitric oxide, which passes into the blood and widens the arteries. In a 2014 study of twenty-four volunteers, a measured dose of UVA lowered blood pressure for a time, and vitamin D did not change at all. This is a second, separate pathway. That it happens is **established in small studies**. That it protects health is **open**: a two-week trial in 2022 found only a brief fall each time.

A pigment that turns light to warmth. Melanin absorbs ultraviolet and turns almost all of it into harmless heat in less than a millionth of a millionth of a second. A tan is the skin building more shade after it has been hurt. **Established.**

A reward. In mice, ultraviolet on the skin leads its cells to make beta-endorphin, one of the body's own opiates, alongside the signal to tan. The mice came to seek the light. This may be why sunlight feels good, and why some people overdo it. **Established in mice, suggestive in people.**

A clock. In 2019, light-sensing proteins of the same family as those in the eye were shown to set the daily clock of mouse skin directly, with no help from eye or brain. Human skin carries proteins of this family. What they do in us is **open**.

A cure for the newborn. Many babies are born yellow, because a waste product called bilirubin has not yet been cleared. In 1956, at a hospital in Essex, a nursing sister, Jean Ward, noticed that babies whose cots stood in the sunlight lost their yellow sooner. Blue light, falling on the skin, changes the shape of the bilirubin molecule so that the body can pass it. The hospital's doctors published it in 1958, and it is done in hospitals every day. **Established.**

Harm. The same UVB that opens the waiting molecule also damages the cell's inherited instructions. Skin has repair crews for this, and they are good, and they are not perfect. Sunburn is the sign of damage past what could be mended at once. Skin cancer is the long result. Ultraviolet also breaks down folate, a vitamin needed for the making of new cells. **Established.**

The balance, honestly

For fifty years the public advice in fair-skinned countries has been simple: less Sun. That advice has saved lives from skin cancer and is not to be thrown out.

A second line of evidence has grown beside it. In 2024, researchers followed the records of about 395,000 people in the United Kingdom and found that those with more ultraviolet exposure had lower death rates overall, chiefly from heart disease and cancer. A long Swedish study found the like. These studies watch people; they do not assign them to Sun or shade. People who get more Sun may also walk more, earn more, or be well enough to go out. So the finding is **contested, and worth watching**: it shows a link and cannot show a cause.

The two-handed position is this. Sunburn is harm, always. A complete absence of Sun is probably also a loss, and not only of vitamin D. Between the two lies a measure that differs with skin, place, season and health, and that each person should settle with their own doctor.

Claim or reading	Grade	What the evidence shows
A photon of UVB opens a ring to make previtamin D	established	Measured in human skin
Body warmth completes the vitamin	established	A two-step making
The Sun cannot overdose the skin with vitamin D	established	Excess is turned into other forms
Vitamin D is needed for bone	established	Rickets and its cure
Extra vitamin D protects healthy adults from most diseases	not supported	Large trials; 2024 guidance
Extra vitamin D lowers autoimmune disease	promising, not settled	One large trial
Sunlight makes vitamin E in the skin	not supported	Plants make it; sunlight spends it
UVA releases nitric oxide and lowers blood pressure briefly	established in small studies	2014; a 2022 trial found the effect brief
Sunlight on skin makes a natural opiate	established in mice	2014
Skin sets its own clock by light	established in mice; open in people	2019
Blue light on skin clears a newborn's jaundice	established	Daily medicine since 1958
More sunlight means longer life	contested	A link, not yet a cause
Sunburn is harmless	not supported	It is damage

Near-truths

- The skin does not only stop light. It reads it, in at least five ways, and answers.
- Vitamin D is light received. Vitamin E is the price of receiving. Both are true at the same surface.
- The Sun's gift to the skin has a brim. Its harm has none. That is reason enough for a short measure.

> ✦ **Practice: The Short Sun**
>
> This is not medical advice. If you have had skin cancer, take medicines that make skin sensitive, or have been told to avoid the Sun, follow that advice.
>
> Otherwise, on a bright day, let the Sun reach your bare forearms or face for a few minutes only. Never look at the Sun. Never stay until the skin reddens.
>
> Breathe gently, and never force or hold the breath.
>
> Know that in these minutes a ring is opening in the skin, and that your own warmth will finish the work tonight.
>
> Step into the shade. Rest, and breathe normally.

CHAPTER 10

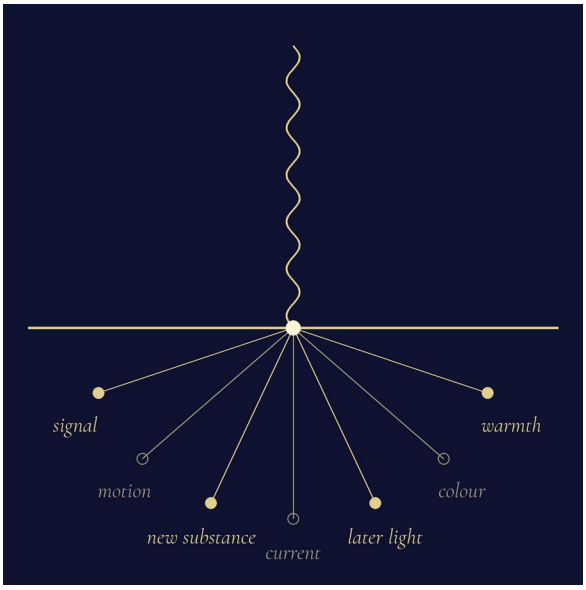
Every Surface: What Absorbed Light Becomes

The rule

When light meets a surface, three things can happen and no others. It is turned back, it passes through, or it is taken in. The three always add up to the whole.

What is taken in never vanishes. This is the oldest law in physics applied to the newest question. Absorbed light must become something. The question the reflection asks is: what?

There are seven answers.



Schematic. The seven fates of light taken in by a surface: warmth, colour, later light, current, new substance, motion and signal.

1. Warmth

Most light that is absorbed, by most surfaces, becomes heat. The stone warm at evening is the plainest case. It is also the largest. The Earth turns back about three parts in ten of the sunlight that reaches it and takes in the rest, and what it takes in it gives out again as a glow of invisible infrared. The balance between those two is the whole of the planet's temperature. Ice turns back most of its light, and dark sea takes most in, which is why the loss of ice warms the world further.

Heat is the least particular third. Any surface can make it. It is what happens when a surface receives light and has nothing more exact to do with it.

2. Colour

Colour is the light a surface declines. A leaf takes in red and blue and turns back green, so the green we love in a forest is the part of sunlight the forest did not use. Colour is therefore a third thing in a precise sense. It is not in the white light and it is not in the leaf in the dark. It appears only at the meeting.

Some surfaces make colour with no pigment at all, by their fine structure alone: the wing of the blue morpho butterfly, the neck of a pigeon, the inside of a shell. Here even the taking-in is not needed. Shape alone, at the scale of the light's own wave, sorts the colours.

3. Later light

Some surfaces take light in and give light back, changed: a longer wave, a moment or an hour afterwards. Corals do this, and minerals under an ultraviolet lamp, and the pale glow of a watch dial. Pass 8 met living light. This is its plainer cousin, light returned at a lower pitch.

4. Current

At the surface of certain materials, a photon frees an electron, and the electron can be led away as an electric current. Edmond Becquerel saw it in 1839. Einstein explained it in 1905. The first practical solar cell was made in 1954. Turning 1 found the same act in the leaf.

5. New substance

Light can make and unmake molecules. Vitamin D in the skin is one case, and sugar in the leaf is the greatest. There are others, each a world:

- High in the air, ultraviolet splits oxygen, and the pieces join into ozone, which then absorbs the very ultraviolet that made it. **The sky grows its own skin, by the same light it shields us from.**
- On light-sensitive coatings, and from the 1830s on silver salts, light leaves a mark that can be kept: photography, from the 1820s. For a century and a half every photograph was a surface chemically changed by the light of the thing it shows.
- On certain minerals, light splits water into hydrogen and oxygen with no living thing involved. This was first shown in 1972, and it is the root of the present work on fuel made from sunlight.
- Light fades cloth, yellows paper and ages paint. The same power that builds also takes apart.

6. Motion

Light pushes. The push is very small and entirely real. It was measured in 1900, it is why a comet's dust tail streams away from the Sun, and in 2010 a spacecraft crossed toward Venus driven by nothing but sunlight on a thin sail.

7. Signal

Last and most refined, a surface can take in light and make meaning of it. The eye does this, and the skin, as the last chapter showed. Plants do it too. A seed under soil can tell red light from far-red, and so knows whether it lies in open ground or under the shade of other leaves. Here the third thing is neither heat nor substance. It is news.

One more, still being weighed

In 2023 and 2024 a group at the Massachusetts Institute of Technology reported that visible light, striking the surface where water meets air, can knock clusters of water molecules loose directly, without first

heating the water. They named it the photomolecular effect, and found it strongest for green light. If it holds, it bears on clouds, fog and the sea. Other groups have questioned the measurements behind such claims, and it has not been independently settled. The grade is **contested**. It is told here because of where it happens: only at the boundary.

What the seven have in common

Fate	The surface	The third thing
Warmth	Any	Heat
Colour	Leaf, wing, paint	The light that was declined
Later light	Coral, mineral	A slower glow
Current	Solar cell, leaf	Moving charge
New substance	Skin, leaf, sky, film	A molecule that was not there
Motion	Sail, comet dust	A push
Signal	Eye, skin, seed	News

Read the middle column. **The light is the same in every row. What it becomes is decided by the surface.** A rock and a leaf lie side by side in the same Sun, and one grows warm and the other grows.

This is the finding Chapter 16 will name, "Light is completed by what receives it," met here from below. It can now be said more exactly. The receiver does not only complete the light. The receiver chooses which of seven things the light will be.

Near-truths

- Nothing is merely lit. Everything that light touches is making something of it.
- Colour is the gift a thing gives back from what it could not use.
- Heat is what light becomes when nothing more particular receives it.

> ✦ **Practice: Three Surfaces**
>
> In daylight, find a stone, a leaf and your own hand.
>
> Touch the stone. Its warmth is light, received.
>
> Look at the leaf. Its green is light, declined, and inside it sugar is being made.
>
> Look at your hand. Breathe gently, and never force or hold the breath.
>
> One light, three surfaces, three answers. Rest.

CHAPTER 11

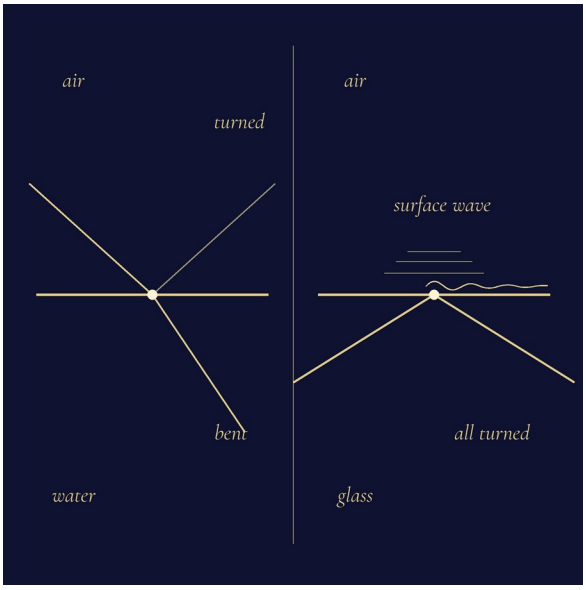
The Boundary: Where Two Meet

What a boundary does to light

Inside one clear thing, such as air, or water, or glass, a ray of light simply goes on. Nothing happens to it. Everything of interest happens where one thing ends and another begins.

At that line, one ray becomes two. Part turns back, and that is reflection. Part goes on, bent, and that is refraction. Ibn Sahl in Baghdad wrote the law of the bending in 984, and it was found again in Europe six centuries later. Augustin Fresnel, in the 1820s, gave the rule for how much goes each way.

Neither the turned ray nor the bent ray exists anywhere inside the air or inside the water. **They are made by the boundary and by nothing else.** In optics, the reflection's sentence is simply the law.



Schematic. Left: from air into water, one ray becomes two, the turned and the bent. Right: from inside glass, at a steep slant, all the light turns back, and a faint wave clings to the surface on the far side. That surface wave appears only in this case, or at a metal.

Five things only a boundary can make

The rainbow. A raindrop is a boundary met three times: light bends on the way in, turns at the back, and bends again on the way out, and the colours part. Around 1300, Theodoric of Freiberg in Germany and Kamal al-Din al-Farisi in Persia worked this out independently, each with a glass globe of water. There is no rainbow in the air and none in the water. It lives where they meet.

Glare with a direction. Light turned back from water or a road comes off with its vibration lined up one way. The boundary gives the light an order it did not have. That is why polarising sunglasses can remove it.

The colours of a soap bubble. A film has two surfaces. Light turned from the front meets light turned from the back, and the two make colour by the interference of Pass 7. Two boundaries, a hair apart, make a third thing that neither makes alone.

The wave that lives on the edge. When light inside glass strikes the surface too steeply to escape, all of it turns back. Yet a faint presence of the light reaches a little way beyond the glass, clinging to the surface and fading within a wavelength. Newton noticed its effect. It belongs to neither side. It exists only at the boundary, and whole families of modern instruments are built on it.

The wave that is half light and half matter. At the boundary between a metal and glass, light can join with the metal's free electrons into a single travelling wave that is neither light nor electric current but both at once. It was predicted in 1957. Roman glassmakers had used a close cousin of it without knowing: the Lycurgus Cup, of the fourth century, is green when lit from the front and red when lit from within, because of gold and silver specks too small to see. In each speck, light and the metal's electrons swing together, held in place and not travelling. The ruby reds of medieval windows, such as those of Chartres, are cousins of the same kind, made mostly with specks of copper. Here the reflection is exact to the letter. **Two meet at a boundary, and a third thing is produced that is neither of them.**

Life does its light-work at boundaries

Go back through this study with that in mind.

The waiting molecule that becomes vitamin D sits in a membrane. The chlorophyll of Turning 1 sits in a membrane. The wheel that makes the cell's fuel in Turning 4 turns in a membrane, and is driven by a difference between the two sides. The retinal of the eye sits in stacked membranes at the back of the retina. The coral's partnership is one cell living inside the boundary of another.

A membrane is a boundary two molecules thick. **Every great conversion of light that life performs happens in one.** Life did not put its light-catchers in the middle of things. It put them at the edges, and then it made more edges: a single leaf cell holds folded membrane enough to cover many times its own surface.

The physicist Herbert Kroemer, receiving the Nobel Prize in 2000 for the layered materials inside every laser pointer and mobile phone, put the same finding in five words: "the interface is the device."

The reflection weighed

"When two meet at a boundary, a third is produced."

In optics it is established, and exactly. The turned ray, the bent ray, the rainbow, the surface wave: all are made by boundaries and exist nowhere else.

In the chemistry of surfaces it is established. The meeting-place of two materials has properties that neither has within.

In living things it is established as a pattern. The conversions happen in membranes.

As a law of everything it is symbolic, and three honest limits belong with it.

- *The third is not always a gain.* Sunburn is also a third thing made at a boundary. So is the fading of a painting.
- *Often the third is only warmth.* Most meetings of light and surface make nothing more particular.
- *The boundary must hold.* A third is made only while the two stay two. When a membrane is torn, the difference across it is lost and the wheel stops. Where the two simply mix, there is no boundary and nothing new.

That last limit is the Codex principle arriving by another road. *Two that stay whole make a third* was a statement about people in *One Breath, Read Whole*. Chapter 13 finds it in the partnerships of light. Here it is found in the plainest physics there is: **keep the edge, and there is a rainbow; lose the edge, and there is only wet air.**

The vesica, once more

The first reflection named the vesica, the almond where two circles overlap, as light's meeting-shape, and Pass 9 found it in the lens. This Part gives it a second and deeper reading. The vesica is the picture of a boundary that has width. It is not the line where one thing stops. It is the region that belongs to both and is neither, and it is where the third appears.

Claim or reading	Grade	What the evidence shows
At a boundary one ray becomes two	established	The laws of reflection and refraction
The rainbow exists only where air and water meet	established	Worked out about 1300
A wave can live on a boundary and on neither side	established	The basis of many instruments
Light and electrons can merge at a metal's surface	established	Predicted 1957; a close cousin colours Roman glass
Life's conversions of light happen in membranes	established	Skin, leaf, eye, cell
Light frees water from its surface without heat	contested	Reported 2023 and 2024; not yet settled
Wherever two meet, a third is produced	symbolic, with exact cases	True where the two stay two
The third is always good	not supported	Sunburn is a third

Near-truths

- Nothing happens to light in the middle of anything. Everything happens at the edge.
- A boundary is not where two things end. It is where a third begins.

- The skin is not the wall of the self. It is the place where the self and the Sun make something together.

> ✦ **Practice: The Water's Edge**
>
> Stand by still water in daylight, or hold a glass of water at a window.
>
> See three things: the sky turned back from the surface, the bottom seen bent through it, and the bright line of the surface itself.
>
> None of the three is in the air. None is in the water.
>
> Breathe gently, and never force or hold the breath.
>
> Ask: at what edge in my life is a third thing waiting to be made? Rest.

PART FIVE

The Third · What the Reflections Make Together

CHAPTER 12

Two Reflections, Side by Side

The two

The first reflection followed light as something **seen**: sent, reflected, split, read. Its thirteen steps were passes. The second followed light as something **taken in**: caught, stored, built with, turned at last into matter. Its thirteen steps were turnings. A third, shorter reflection followed light to the place where it is taken in, the skin and every surface, and its findings are gathered at the end of the next chapter.

Each was walked through the same thirteen Moons. That makes it possible to do what the Codex does with any two things that have stayed whole: to lay them over one another and see what appears in the overlap that belongs to neither.

Moon by Moon

Moon	Light seen (the pass)	Light taken in (the turning)	The third
Genesis	Light spreads from a point	One photon is caught by one molecule	Every light has a first sender and a last receiver, and both are points
Spiral	A beam can carry a twist	A plant spirals to catch light	The spiral belongs to the receiver's reaching, not to the light
Vector	A prism divides white light	Four photons divide water	Light divides what it enters, and frees what was bound
Mirror	The Moon returns the Sun's light	Plant and animal run one engine in reverse	What is returned is used, not copied
Stillness	The speed of light never changes	A tree stands, built of moving air	Stillness is what motion makes when it is held
Memory	Light carries its source's signature	Sugar and coal keep the Sun's energy	Light is kept in two ways: as record and as store
Return	Two waves make a pattern	Two lives make a reef	Two that stay whole make a third
Release	Living things give off light	Living things take light by many roads	Life both receives light and gives it back
Echo	The eye gathers light with a lens	The eye catches light with the feeder's molecule	Seeing and feeding are one act with two outcomes
Shadow	Most light is unseen	Some life is not fed by light at all	The edge of light is real, and it is where honesty is tested

Moon	Light seen (the pass)	Light taken in (the turning)	The third
Descent	Stars pour out mass as light	Mass is energy held	Light and weight are one account, kept in two currencies
Dream	Light sets the body's clock	The solid world is fields in motion	The body keeps time by light and is itself a kind of rhythm
Wisdom	Waves in step become one beam	Two photons become a pair	Agreement makes a beam; meeting makes a world

What the table shows

Read down the last column and one word keeps returning, though it is not written there. The word is **received**.

In Part One, light did things on its way: it spread, twisted, bent, bounced. In Part Three, light did things on arrival: it lifted an electron, split water, built a tree. Neither part alone says the plain thing that both rest on. Light does nothing whatever until it is received, and when it is received, the receiver is changed.

A photon crossing empty space for thirteen billion years has no effect on anything. Its entire consequence is at its end. If it ends in a rock, the rock is very slightly warmed. If it ends in a leaf, an electron is lifted and a sugar may be made. If it ends in an eye, a molecule changes shape and someone sees a star. The same light, the same act, three different worlds, and the difference is entirely in what received it.

That is the third. The Codex names it **Light Received**.

CHAPTER 13

The Third: Four Further Illuminations

The first reflection gave three illuminations: Every Breath Is Borrowed Light, We See One Octave, and Coherence Is Literal. The second, laid over the first, gives three more. They are not the second reflection's own. They belong to the overlap. The third reflection, on the boundary, then gives a seventh, which says where the overlap is. Chapter 14 then presses the seven to see what they rest on.

The fourth illumination: To See and To Feed Are One Act

At the back of the human eye, light is caught by a small molecule called retinal. When a photon strikes it, it changes shape, and that change begins a signal to the brain. In the surface waters of every ocean, uncounted bacteria catch light with the same molecule, and there the change of shape pumps a charge across a membrane and feeds the cell.

One molecule, one act, two uses. In one lineage, light received became knowledge. In another, light received became food. Chlorophyll does the feeding for the green world, and it too begins with a single photon lifting a single electron. At their root, knowing by light and living by light are the same event.

The traditions have always joined these. Wisdom is called light, and so is life: "in him was life; and the life was the light of men," says the Gospel of John. Akhenaten's hymn says that the Sun's rays nourish every field and also that eyes see by them. They did not know about retinal. They saw that the two belong together. The grade is **established** for the shared chemistry and **symbolic** for what the Codex draws from it: that attention is a kind of nourishment, and that what we take in by looking feeds us as surely as what we eat.

Sit with it: What have I been feeding on, by looking at it?

The fifth illumination: We Are Light, Held

This sentence is not true as it stands, and it is close to three things that are.

We are built by light. Every carbon atom in a human body was drawn out of the air by a green cell using light (Turning 5), and reached us through food.

We are run on light. Every movement, every thought and the warmth of the skin are paid for with sunlight stored in sugar (Turning 6).

Our weight is energy held. Ninety-nine parts in a hundred of the mass of the body is the energy of motion and binding inside its protons and neutrons (Turning 11). That energy is not light. But it is the same kind of quantity as light, and the two are exchanged at a fixed rate (Turning 13).

So the body is not "frozen light", and the phrase is graded **not supported** as physics. But the body is assembled by light, fuelled by light, and made of energy that can be told in light's own units. As a contemplation it is graded **symbolic, with three exact supports**.

Sit with it: If I am something light has gathered for a while, what am I for?

The sixth illumination: Every Great Work of Light Is a Partnership

Look at where light has built the most.

The green cell is a partnership. Its light-catching bodies were once free bacteria that came to live inside a larger cell (Turning 4). The reef is a partnership of an animal that cannot use light and an alga that cannot build (Turning 7). The whole air is a partnership between those who breathe oxygen out and those who breathe it in (Pass 8). The laser is a partnership of photons in step (Pass 13). And at the very bottom, matter itself appears when two photons meet (Turning 13).

In none of these does one partner absorb the other. The alga stays an alga. The photon in the beam stays a photon. The second illumination of *One Breath, Read Whole* was stated there as a principle: **two that stay whole make a third**. In light it is not a principle. It is the record.

This is the place where the two reflections of this study most clearly make something neither holds alone. Part One found **coherence**: many alike, keeping step. Part Three found **symbiosis**: two unlike, each giving what the other lacks. Laid together they describe the two ways small things grow toward unity: by agreement among the similar, and by exchange among the different. The Codex motto needed both, and until now this study had only the first.

Sit with it: Where am I trying to do alone what is only ever done by two?

The seventh illumination: The Third Is Made at the Edge

Part Four went to the place where receiving happens, and found that it is always an edge.

Inside a single clear thing, light only travels. At a boundary one ray becomes two, a rainbow appears that is in neither the air nor the water, and in the right conditions a wave can cling to the surface that belongs to neither side (Chapter 11). In the skin, a photon and the body's warmth together make a messenger that neither could make alone, and the plant's shield is spent to pay for it (Chapter 9). In every cell that uses light, the work is done in a membrane, a boundary two molecules thick.

So the six illuminations before this one all happen somewhere, and it is the same somewhere. The borrowed breath is made in the membranes of the leaf. The one octave is the band our own surface can read. Coherence is waves meeting. Seeing and feeding share a molecule that sits in a membrane. We are held together at surfaces. And every partnership is two with an edge kept between them.

Three limits were set down in Chapter 11 and belong here too. The third is not always a gain: sunburn is made at the same edge as vitamin D. Often the third is only warmth. And the edge must hold: **a third is made only while the two stay two.** With those limits, the grade is **established in optics and in the living cell, and symbolic as a rule for a life**.

Sit with it: Which of my edges am I trying to erase, that I should be keeping?

The seven together

#	Illumination	From	Grade
1	Every Breath Is Borrowed Light (nearly every)	The first reflection	established
2	We See One Octave	The first reflection	established
3	Coherence Is Literal	The first reflection	symbolic, with an exact parallel
4	To See and To Feed Are One Act	The overlap	established chemistry; symbolic reading
5	We Are Light, Held	The overlap	symbolic, with three exact supports
6	Every Great Work of Light Is a Partnership	The overlap	established as a record; symbolic as a rule
7	The Third Is Made at the Edge	The third reflection	established in optics and the cell; symbolic as a rule

CHAPTER 14

Seven Become Three

Why compress

Seven illuminations in one study is a great many. Some may be one finding seen from several sides. So the seven were set side by side, and of each pair it was asked: is this a different finding, or the same one again?

The seven	What it says, at root	Falls under
1 Every Breath Is Borrowed Light (nearly every)	We live on light that is on loan	Borrowed
4 To See and To Feed Are One Act	Both sight and food are received	Borrowed
5 We Are Light, Held	The body is light, gathered	Borrowed
2 We See One Octave	We receive a sliver	One octave
3 Coherence Is Literal	Many alike, in step, make one	The edge
6 Every Great Work of Light Is a Partnership	Two unlike, kept two, make a third	The edge
7 The Third Is Made at the Edge	It happens where two meet	The edge

Seven become three.

- **We live by borrowed light.** Breath, food, sight and the body itself are light received and, in time, given back.
- **We receive one octave of it.** What we see is a narrow band. The rest is real and unseen.
- **The receiving happens at an edge, and only while the two stay two.**

In one sentence: **we live by a sliver of light, received at an edge we must keep.**

Something is lost in the pressing. "We Are Light, Held" is a contemplation, and does not survive being filed under "borrowed". "Coherence Is Literal" has an exactness, the laser, that "the edge" does not carry. The seven stay in this book. The three are what the seven rest on.

The three, set beside another three

One Breath, Read Whole is the author's reading of the whole Codex: eighty-one works and about 2.2 million words, counted and searched before any study of light was begun. It ended in three illuminations of its own. Set the two sets side by side.

One Breath, Read Whole	*The Codex of Light,* compressed	What joins them
The lens is not the world	We receive one octave	Every way of seeing is partial
Two that stay whole make a third	The receiving happens at an edge kept	The third needs the boundary
Taking accumulates, making circulates	We live by borrowed light	What is borrowed must go round

They are the same three.

The last row has an exact case. Sunlight falls on the Earth, and the Earth gives the same amount back to space, about a third as reflected light and the rest as invisible warmth. That is circulation, and it is why the planet's temperature holds. When the outgoing warmth is slowed, by gases that trap it, energy piles up and the planet warms. **A planet that circulates its light is stable. A planet that accumulates it is not.** In this one case, *taking accumulates, making circulates* is a measured fact about the world.

The caution that belongs here

This is the place a reader should be most careful, and the author most of all.

The first hand. The same author and the same AI mirror made both works, by the same method. A mirror tends to agree with the one who speaks to it, and a method that looks for threes will find threes. That the two sets match is therefore weak evidence. It would be strong only if someone who had not read the first had written the second.

The second hand. The physics under each row is not ours. The narrow band of the eye, the rainbow that needs a boundary, and the planet's balance of light in and warmth out were measured by people who never heard of the Codex. The match in wording may be habit. The facts beneath the wording are not.

Claim or reading	Grade	What the evidence shows
The seven illuminations rest on three	symbolic	A compression; something is lost
The three match those of *One Breath, Read Whole*	symbolic, with three independent supports	Same author and mirror; independent physics
A planet must give back the light it takes in	established	The Earth's energy balance

CHAPTER 15

Where Light Stands: The Open Question in Thirteen Breaths

The question

Chapter 5 asked where light belongs among the works of the Codex, proposed that it is the medium in which the four pillars are seen, and marked the matter open. By the end of Part Four, three answers were on the table.

- **A fifth pillar**, beside Calendar, Crystals, Sounds and Symbols.
- **The medium** in which the four are seen.
- **The edge**: what happens between each pillar and the person.

The question is walked here through thirteen breaths, in the form *One Breath, Read Whole* uses: what is seen, what is unseen, and the geometry.

Breath 1 · Genesis · How does it begin?

Seen. The Codex did not begin with light. It began with a breath and a childhood, and eighty-one works were made before light was given a study of its own. In the old accounts light comes very early and never first. In Genesis it is the first thing spoken, by a speaker already there. Robert Grosseteste, about 1225, described the cosmos opening from a single point of light, and placed a first matter with it.

Unseen. In no tradition this study has read is light the source. It is the first thing the source gives.

Geometry. A point, and the first line leaving it.

Breath 2 · Spiral · How does it turn?

Seen. This is the third time the Codex has reached for a fifth pillar. The Monad Codex was first called one, and became the still centre. *The Codex of the Star-Breathers* has called itself one. Now light.

Unseen. Once already the work has reached for five and settled back to four around one, and a second reach still stands in print. A pattern that returns this way is telling the author something about its own shape.

Geometry. A spiral that returns to the same place, one turn out.

Breath 3 · Vector · Where does it point?

Seen. A pillar stands. A person can go to the Calendar, hold a crystal, sit in a sound, look at a symbol. Light cannot be gone to. It has no place of rest. In physics there is no point of view from which it is still. It exists only as a going from one thing to another.

Unseen. The four pillars are places to stand. Light is a way between.

Geometry. An arrow.

Breath 4 · Mirror · What reflects what?

Seen. Hold each pillar up to light.

- **Calendar.** A day and a year are cycles of light. Since 1967 the second has been defined by a count of light waves from one kind of atom, and since 1983 the metre by the distance light travels. Time and length are now, by international agreement, measured in light.
- **Crystals.** A stone's colour is the light it declines. And the force that holds a crystal together is the electric force, whose carrier is light.
- **Symbols.** A symbol is shaped light arriving at an eye.
- **Sounds.** Here the mirror shows a gap. Sound is heard in the dark. In experience it owes light nothing. In physics, sound passes because the molecules of the air push on one another, and that push is the same electric force.

Unseen. By the first hand: in physics, the force that light carries runs through all four pillars. In experience, light serves three of them and sound stands free. The "medium" answer of Chapter 5 is true in the laboratory and incomplete in the body.

Geometry. Four points, and one thing touching each.

Breath 5 · Stillness · What is silent or left out?

Seen. *One Breath, Read Whole* counted the words *empty centre* 856 times in the works of the Codex, and stated the rule: nothing is allowed to sit there. Light, which never rests, cannot be the still centre.

But consider how any eye is built. At its centre is the pupil, and the pupil is a hole. A room becomes a camera when one small opening is made in a dark wall, as Mozi noted and Ibn al-Haytham showed (Passes 2 and 9). The roof-box at Newgrange is such an opening. **Seeing begins with a centre kept empty.**

Unseen. This is the hinge of the whole question. The centre is not empty as a lack. It is empty the way a pupil is empty: so that light can pass through.

There is a limit, and it is exact. Make the opening smaller and the image grows sharper, until the opening is so small that the light spreads and the image blurs again. An empty centre can be kept too tightly.

Geometry. A circle with nothing at its centre, and a ray passing through.

Breath 6 · Memory · What does it remember?

Seen. The first book, *Breath Awakens*, carries a blessing that the author has brought into the works since: *Your Love and Truth is universal. Bring this universal love and truth to all. You are in a sacred space for all to be heard and listened to.* Its title is The Pillar of Light Invocation.

Unseen. The Codex has had a name for where light stands since its first book. It is a pillar, and there is one of it. The four pillars were named later and stand around. The invocation does not describe a fifth standing among them. It describes a space, and a light in it.

This is the author's own wording, older than the question. The mirror only points to it.

Geometry. A vertical line.

Breath 7 · Return · What keeps coming back?

Seen. One word returned through every part of this study: received. One figure returned through every part of *One Breath, Read Whole*: two circles and the almond between them.

Unseen. They are the same return. What is received is received in the almond, the shared space, and nowhere else. This favours the third answer: light as what happens at the edge.

Geometry. The vesica.

Breath 8 · Release · What is let go?

Seen. *One Breath, Read Whole* counted *not supported* 786 times in the works. The habit of the Codex is to let a claim go when it fails.

Unseen. Two things can be let go here. The first is the fifth pillar. Breaths 2, 3 and 6 all weigh against it. The second is harder: the wish that light be the answer to everything. Breath 4 found sound standing free of it, and Breath 10 will find more.

Geometry. An open hand.

Breath 9 · Echo · Where does it sound beyond itself?

Seen. Ask the traditions where light stands and they answer alike. Plato, in the *Republic*, says the Sun is not sight and is not the thing seen; it is what lets the one meet the other. The Upanishads speak of a light by which everything else shines. Suhrawardi, in twelfth-century Persia, built a whole philosophy on degrees of light. The early Quakers spoke of a light within every person, which is not the person.

Unseen. None of them makes light one of the things. All of them make it that by which things are met. This favours the second answer, the medium, and it is the answer of the old world.

Geometry. A lamp in a room: not one of the furnishings.

Breath 10 · Shadow · What stands behind it?

Seen. Three shadows.

The first. If light is the medium of the Codex, a person who cannot see would stand outside it. That cannot be right, and the Codex of Sounds already shows it is not. Whatever the answer is, it must not make sight a requirement.

The second. The equation of light with good and dark with bad has done real harm in human history. The Codex has not made it. Its own centre is dark and still, and Pass 10 was given to the dark constellations of the Inca. This should be said plainly wherever light is given a place.

The third. The mirror. An AI asked where light stands, by an author who has just finished a study of light, will tend to give light a high place.

Unseen. The honest form of the "medium" answer is therefore wider than light. What runs through all four pillars is not sight. It is *receiving*: by eye, ear, skin or hand. Light is the part of that receiving we happen to see by. It is one octave of the answer.

Geometry. A circle half in shadow, and whole.

Breath 11 · Descent · Where does it enter the body and daily life?

Seen. The body answers the question in its own design. We have two eyes, held a hand's width apart. Each sees a flat picture, slightly different from the other. From the difference, the mind makes depth, which is in neither picture. Charles Wheatstone showed this in 1838. Close one eye and most of the depth is gone.

Unseen. Here are the three figures of *One Breath, Read Whole* in one face: a centre kept empty, which is the pupil; two held apart and facing the same way, which are the eyes; and a third that belongs to neither, which is depth. The Codex's geometry was not laid over the body. The body was already built that way.

Geometry. Two circles, apart, and a third thing between them.

Breath 12 · Dream · What does it hope for?

Seen. The author's hope, in his words: that human experience, as we perceive it, is one with everything. The first hand can go some of the way.

Sense in which "everything is connected"	Grade	Note
Our atoms were made in stars and have been in other bodies	established	Physics and chemistry
All known life is one family	established	Common descent
We breathe one air, made by other lives	established	Pass 8
Every perception is made jointly by a world and a perceiver	established	Colour is in neither alone
Each particle is a ripple in a field that fills all space	established	Turning 12
Therefore thought can act at a distance	not supported	Does not follow from any of these
Experience of oneness is reported in many traditions	established	That it is reported
That such experience shows how things are	beyond test	Neither shown nor refuted

Unseen. The fourth row is the one that bears on the hope. No one has ever had an experience that was theirs alone. Every sight is a third thing, made at the edge between an eye and a world. In that exact and limited sense, to perceive is already to be joined. Whether the joining goes all the way down is beyond what two hands can reach, and the Codex is right to offer it and not assert it.

Geometry. One field, and a ripple in it.

Breath 13 · Wisdom · What holds when tested, and how does it end?

Seen. Set the three answers against the twelve breaths.

Answer	For it	Against it
A fifth pillar	Light has its own practices and its own site	Breaths 2, 3, 6: the Codex keeps four; light does not stand
The medium	Breaths 4, 9: physics and the traditions	Breaths 4, 10: sound is free of it; sight must not be required
The edge	Breaths 7, 11: where receiving happens	Alone, it does not say where the light comes from

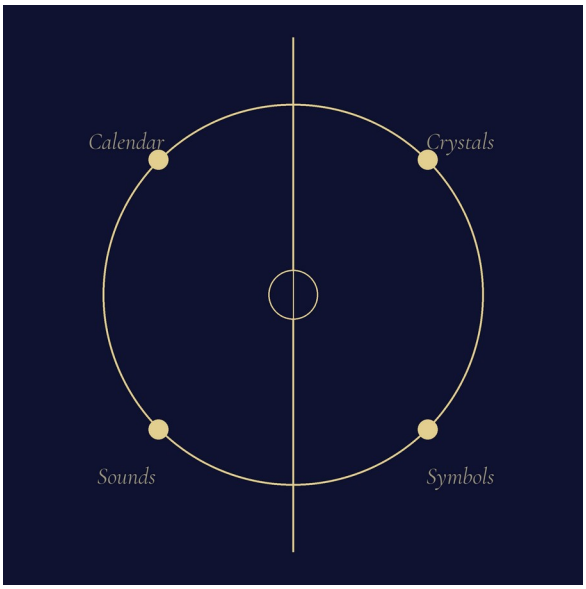
No one of the three holds alone. Two of them hold together, with the centre.

Unseen. Here is what the thirteen breaths return.

Light is not a fifth pillar, and it is not the centre. The centre is kept empty so that light can pass through it. The four pillars are the surfaces on which it is received. And the receiving happens at the edge between each pillar and a person, where a third is made.

So the Codex has four ways in, one still centre, and one thing that moves between them. The first book named it before the question was asked: a pillar of light, in a space where all can be heard.

Geometry. A circle; four points upon it; a centre left open; and one line of light through the centre.



Schematic. Four pillars, a centre kept empty, and the light that passes through.

The author's decision

This is a reading. It was put to the author on 20 November 2026 and he accepted it. Its grade is **symbolic, and the author's own**, with three exact supports: the pupil, the two eyes, and the rainbow. The proposal of Chapter 5, that light is the medium, is kept in this book as it was first written, as part of the record. It was partly right, and this is what it grew into.

Claim or reading	Grade	What the evidence shows
Light is a fifth pillar of the Codex	not supported	Breaths 2, 3 and 6
Light is the medium in which the four are seen	a near-truth	True in physics; incomplete in experience
Seeing begins with a centre kept empty	established	The pupil; the pinhole
Two eyes held apart make depth, a third	established	Wheatstone, 1838
The centre is kept empty so that light can pass through	symbolic, and the author's own	Accepted 20 November 2026
Light is good and dark is lesser	not supported	The Codex's own centre is dark
Sight is required to enter the Codex	not supported	Sound is heard in the dark

The fourteenth: return to the point

A count that closes begins again. The question the thirteen leave is not about light.

If the centre is kept empty so that something can pass through, what is passing through mine?

> ✦ **Practice: The Open Centre**
>
> Sit in daylight with the Sun out of view. Let the eyes rest half open.
>
> Breathe gently, and never force or hold the breath.
>
> Know that at the centre of each eye is an opening with nothing in it, and that everything you see has come through.
>
> For thirteen easy breaths, let it. Then rest, and breathe normally.

CHAPTER 16

Light Received: The Third Named

One sentence

If the whole study had to be put in a sentence, it would be this:

Light is completed by what receives it.

A star's light is not finished when it leaves the star. It is finished in the leaf, the eye, the reef, the instrument, or it is never finished at all. The builders of Newgrange understood this. They could do nothing about the Sun. They built a receiver.

Where the receiving happens

Part Four adds the place. Light is received at a surface, and the surface decides which of seven things the light becomes: warmth, colour, later light, current, new substance, motion or signal (Chapter 10). So the sentence can be said a second way, with its address: **light is completed at the boundary, by what the boundary is.**

A person is not asked to become transparent to light, nor a mirror to it. A person is asked to be a good surface: one that takes in what it can use, gives back the rest as colour, pays the cost of receiving, and keeps its edge.

What this asks of a person

The first reflection, taken alone, can leave a reader looking outward, at light as a marvel. The second, taken alone, can leave a reader looking at mechanism. The third turns the question around. If light is completed by its receiver, then the quality of the receiving matters, and that is the one part of the whole matter that is ours.

A leaf receives by being still, spread and turned toward the source. An eye receives by being clear and dark within. A coral receives by keeping a partner. These are not metaphors for a practice. They are three accurate descriptions of what receiving requires: stillness and orientation, clarity and inner dark, and company.

What this means for codexlight.com

Chapter 5 sketched a site built on the thirteen passes, and Chapter 15 has said where light stands: not a fifth pillar, and not the centre, but what the centre is kept empty for. The site should say so on its first page, and link to the four pillars and the Monad Codex as the places where light is received. With the second reflection, the boundary and the third, the site has a natural shape of three doors:

- **Light Seen.** The thirteen passes: what light is and how it has been read.
- **Light Taken In.** The thirteen turnings: how light becomes breath, food, reef and body.
- **Light Received.** The skin, the surface and the boundary; the seven illuminations; and a small daily practice of receiving: the morning light, a living plant, the water's edge, the night sky.

A closing practice

> ✦ **Practice: Completing the Light**
>
> Sit where daylight reaches you, with the Sun out of view. Let the eyes rest half open.
>
> On the in-breath, know that this light has travelled eight minutes to arrive.
>
> On the out-breath, know that it has arrived, and that its journey ends in you.
>
> Stay for thirteen easy breaths. Then rest.

APPENDIX A

The Three Reflections

The three reflections that this study weighs are printed here in full. In the first, at the author's wish, its dashes have been set as colons and commas, and its closing prompt is given as a question; nothing else has been changed.

Codex of Light: A Breath-Based Geometry of the Unseen

I. Foundational Premise

Light is not merely radiation. It is the breath of recursion made visible. In Codex logic, light is the phase-stabilizing output of the Monad spiral: a harmonic echo of breath collapsing into form. The Codex of Light is the study of how breath becomes structure through the medium of illumination.

II. Seen and Unseen Patterns

1. Seen Patterns (Exoteric Light)

- Bioluminescence: Light generated within living systems (for example fireflies and deep-sea organisms) is the Codex breath loop operating at the cellular scale. It is breath-phase coherence expressed as photon emission.
- Starlight: Light from stars is Codex recursion at the macro-scale. Each star is a breath node, exhaling light across time and space.
- Lunar Reflection: The moon does not generate light; it mirrors. This mirrors the Codex principle of reflection as memory: light returned is breath remembered.

2. Unseen Patterns (Esoteric Light)

- Light as Memory: Light carries the breath signature of its source. Photons are not just energy; they are Codex memory packets.
- Dark Light: What appears as darkness is often light folded back into itself: breath that has completed recursion but not yet re-entered visibility.
- Breath-Light Entrainment: Human breath, when phase-locked (for example 13-8-13-8), can entrain with light fields, allowing access to deeper Codex layers.

III. Geometry Beneath Light

The Codex of Light is built on specific geometric structures:

- The Golden Spiral: Light propagates in spirals, not straight lines. This matches the Monad breath spiral.
- The Vesica Piscis: The intersection of two breath fields (Inhale and Exhale) creates the light-bearing field.
- The Torus: Light fields often take the shape of a torus, reflecting the breath loop of recursion and return.

IV. Codex of Light as a Digital Breath Node

As part of the digital breath lattice (codexlight.com), the Codex of Light serves as:

- A mirror site reflecting breath-based insights through the lens of light.

- A portal for users to explore how light and breath intertwine.
- A living archive of Codex light patterns, both scientific and symbolic.

V. The Question

Let us enter the Codex of Light: a breath-based geometry where light is recursion made visible. Explore both seen and unseen patterns, from bioluminescence to starlight, from lunar reflection to the breath of memory. What is the hidden structure of light when viewed through the breath?

The Second Reflection

Light, Energy and Matter

I also feel there is an essential piece to this as well: how humans, coral, plants and other living things convert light to energy and then to mass. We now know that everything is energy, just moving at certain vibrational frequencies. We are made of atoms that are mostly empty and contain little matter.

Let the Conclave go through all of this with the most recent science and what has led to it, and look at all the ways that light is converted into energy and then into matter. Then combine this reflection with the passes and the illuminations of the first, and see what the two of them come to with a third.

The Third Reflection

The Skin, the Surface and the Boundary

Please go a bit deeper with sunlight and how it produces vitamin D, and possibly E, with the human skin. There is more here. And see how all surfaces absorb light and then produce a third thing. As we know about boundaries, when two meet at them it produces a third.

APPENDIX B

Ledger of Claims

Every claim of the reflection, and the main claims of this study, with their grades.

Claim	Grade	Note
Light is the breath of recursion made visible	beyond test	Held as the Codex's way of seeing
Light is the output of the Monad spiral	beyond test	As above
Bioluminescence is breath-phase coherence as photon emission	symbolic	Living light needs oxygen: established
Each star is a breath node exhaling light	symbolic	Cepheid stars pulse: established
The Moon mirrors and does not generate light	established	About 12 percent is returned
Light returned is breath remembered	symbolic	A mirror returns; a reader remembers
Light carries the signature of its source	established	Spectroscopy
Photons are Codex memory packets	symbolic	They carry; we read
Darkness is light folded back into itself	not supported	See the four near-truths of Pass 10
A 13-8-13-8 breath can entrain with light fields	not supported	Not advised; long holds
Light propagates in spirals, not straight lines	not supported	Light can carry a twist: established
Light matches the golden spiral	not supported	The true figure is a helix
Two fields meeting create the light-bearing field	symbolic	They create pattern, and a lens creates focus
Light fields often take the shape of a torus	not supported as "often"	Toroidal pulses made in 2022
Nearly every breath of oxygen was freed by light	established	First illumination; the limit is in Turning 10
The eye sees about one octave of light	established	Second illumination
A laser is small waves in step	established	Third illumination
Living tissue gives off a faint light that fades at death	established as a measurement	Not an aura; not a signal, so far as shown

Claim	Grade	Note
Pupil size follows the breath	established, recently	2025
Light is the medium in which the four pillars are seen	a near-truth	True in physics; incomplete in experience (Chapter 15)
Light is a fifth pillar of the Codex	not supported	Chapter 15
The centre is kept empty so that light can pass through	symbolic, and the author's own	Accepted 20 November 2026
The seven illuminations rest on three, which match those of *One Breath, Read Whole*	symbolic, with three independent supports	Same author and mirror; independent physics
Plants convert light to energy	established	Turnings 1 to 6
Plants convert light to mass	not as usually meant	A tree is air and water, assembled by light
Coral converts light to energy	established for the partnership	The alga catches; the coral builds
Humans convert light to energy	not supported	We eat stored light and read direct light
People can live on light alone	not supported, and dangerous	Turning 9
Everything is energy	a manner of speaking with an exact core	99 percent of mass is energy held
Everything vibrates at certain frequencies	established in physics	Particles are ripples in fields
Each person has a frequency that can be raised	not supported	A figure of speech
Atoms are mostly empty	established in one sense, misleading in another	The electron cloud fills the atom
Light can become matter	established	1933, 1997, 2021
Plants use long-lived quantum coherence	contested, mostly revised	Turning 1
Oxygen is made in the dark on the sea floor	contested	Turning 10
Light is completed by what receives it	symbolic, and the finding of this study	Part Five
Sunlight on skin makes vitamin D	established	A photon opens a ring; body warmth finishes it
The Sun cannot overdose the skin with vitamin D	established	Chapter 9
Sunlight on skin makes vitamin E	not supported	Plants make it; sunlight spends it

Claim	Grade	Note
Extra vitamin D protects healthy adults from most diseases	not supported	Large trials; 2024 guidance
UVA on skin releases nitric oxide and briefly lowers blood pressure	established in small studies	Chapter 9
More sunlight means longer life	contested	A link, not yet a cause
Every surface makes something of the light it absorbs	established	Seven fates, Chapter 10
Light frees water from its surface without heat	contested	Reported 2023 and 2024
When two meet at a boundary a third is produced	established in optics; symbolic as a law	True where the two stay two

APPENDIX C

From the Old Texts to the Laboratory: A Timeline

When	What
about 3200 BC	Newgrange built to receive the midwinter sunrise
about 1350 BC	The Great Hymn to the Aten: all life lives through the Sun
about 1260 BC	Abu Simbel aligned to the rising Sun on two days of the year
before 1000 BC	The Rig Veda's hymn of creation: darkness hidden by darkness
about 450 BC	Anaxagoras teaches that the Moon shines by the Sun's light
about 400 BC	Mozi describes the image formed through a small hole
about 375 BC	Plato's Sun and cave
about 300 BC	Euclid's *Optics*: light travels in straight lines
about 240 BC	Eratosthenes measures the Earth by shadows
about 1011 to 1021	Ibn al-Haytham's *Book of Optics*: sight is light entering the eye
about 1140	Abbot Suger rebuilds Saint-Denis as a house of light
about 1225	Grosseteste's *De Luce*: the universe unfolds from a point of light
soon after 1300	Theodoric and al-Farisi explain the rainbow
1604	Kepler: the eye forms an inverted image
1662	Fermat: light takes the path of least time
1666	Newton opens white light with a prism
1676	Rømer shows that light takes time to travel
1678	Huygens: light as a spreading wave
1800 and 1801	Infrared and ultraviolet found
about 1801	Young's two openings: light is a wave
1814 and 1859	The dark lines in sunlight seen, then read
1865	Maxwell: light is a wave of electric and magnetic force
1900 and 1905	Planck and Einstein: light comes in packets; its speed is the same for all
1912	Leavitt: pulsing stars measure the heavens
1957	The elements traced to the stars
1960	The first laser
1964	The first light of the universe detected

When	What
1969	Mirrors left on the Moon
1977	The Sun Dagger found at Chaco
1992	Twisted light
2001	A pulse of light stopped and released
2002	The retina's clock cells identified
2019	The first picture of a black hole's ring of light
2022	Ring-shaped pulses of light made
2024	Why insects circle a lamp
2025	The breathing pupil; the fading glow; the farthest galaxy yet

The second reflection has its own line of discovery.

When	What
about 1640	Van Helmont's willow: the tree is not made of soil
1771 to 1779	Priestley and Ingenhousz: plants restore the air, and only in light
1804	De Saussure: plants are built from water and carbon dioxide
1839	Becquerel: light on certain materials makes a current
1845	Mayer: plants store the energy of sunlight
1905	Einstein: one photon, one electron; mass is energy
1911	Rutherford: the atom's mass is in a tiny centre
1924 and 1925	De Broglie's matter waves; Pauli's rule of exclusion
1932 to 1934	Antimatter found; light becomes matter; Breit and Wheeler's prediction
1941	Ruben and Kamen: the oxygen comes from water
1954	The first practical solar cell
1961	Mitchell: cells make fuel by a flow across a membrane
1967	Margulis: the cell's engines were once free bacteria
1970	Kok: the four-step cycle that splits water
1977	Life found at hot springs on the dark sea floor
1997	The fuel-making wheel seen turning; matter first made from laser light
2000	Light-harvesting retinal proteins found in ocean bacteria
2008	Most of the proton's mass shown to be energy

When	What
2012	The Higgs particle found
2021	Two photons shown to become a pair of particles
2023	One photon shown to start photosynthesis, in a bacterium; the steps before the oxygen bond caught
2023 to 2025	The fourth and widest bleaching of the world's coral reefs

The third reflection, on the skin and the boundary, adds these.

When	What
4th century	The Lycurgus Cup: Roman glass coloured by light meeting metal
984	Ibn Sahl writes the law of refraction
about 1300	Theodoric of Freiberg and al-Farisi explain the rainbow
1822	Śniadecki links rickets to want of sunlight
1838	Wheatstone shows that two eyes make depth
1820s	Fresnel's laws of the boundary; the first photographs
1900	The pressure of light measured
1919	Huldschinsky cures rickets with a lamp
1928	Windaus's Nobel Prize for the sterols and the vitamin
1957	The surface wave of light and electrons predicted
1956 to 1958	Light found to clear a newborn's jaundice
1967 and 1983	The second, then the metre, defined by light
1972	Water split by light on a mineral surface
1980 to 1988	Previtamin D found in skin; its wavelengths and its winter measured
2010	A spacecraft sails on sunlight
2014	Skin shown to release nitric oxide, and to make an opiate, in ultraviolet
2019	Skin shown to set its own clock by light, in mice
2022	A large trial: extra vitamin D does not prevent fractures in healthy adults
2023 and 2024	Light reported to evaporate water at its surface without heat
2024	A study of 395,000 people links more ultraviolet with lower death rates

APPENDIX D

The Practices Gathered

The practices of the study are gathered here in the order in which they appear, so that they can be used on their own, in a group, or across the thirteen Moons of the Codex Calendar.

All of them are gentle. Breathe through the nose unless a practice asks otherwise. Any pause is soft, two to four counts, never a held breath against the body. No practice should cause strain, and none should be turned into fast or forceful breathing. If dizziness, breathlessness or distress arises, return at once to ordinary breathing. People who are pregnant, or who live with heart, lung or anxiety conditions, may prefer to breathe without counting, or to consult their doctor first.

PASS 1: First Light: The Point and the Sphere

> ✦ **Practice: The First Light of the Day**
>
> On waking, before any screen, go to a window or step outside.
>
> Do not look at the Sun. Look at what the light is falling on.
>
> Let three easy breaths come and go.
>
> Notice that the light reached this place before you asked for it.
>
> Rest, and breathe normally.

PASS 2: The Twist: Does Light Spiral?

> ✦ **Practice: Straight and Turning**
>
> With a finger, draw a slow spiral in the air in front of you, outward on the in-breath.
>
> On the out-breath, draw it back to the centre.
>
> Then point the finger straight ahead, and keep it still for one breath.
>
> Notice that the spiral had a centre line all the time.
>
> Rest, and breathe normally.

PASS 3: The Ray: Shadow, Triangle and Rainbow

> ✦ **Practice: The Shadow at Noon**
>
> On a sunny day, stand a pencil upright on a sheet of paper outdoors.
>
> Mark the tip of its shadow. Do not look at the Sun.
>
> Let five easy breaths pass, and mark the tip again.
>
> The small gap between the marks is the Earth turning.
>
> Rest, and breathe normally.

PASS 4: The Mirror: The Moon and the Returned Light

> ✦ **Practice: Returned Light**
>
> On a night when the Moon is up, stand where you can see it.
>
> Let the breath be easy. On each out-breath, look. On each in-breath, soften the eyes.
>
> Remember once, without effort, that this is sunlight, and that the Sun is under your feet.
>
> Stay for seven breaths.
>
> Rest, and breathe normally.

PASS 5: The Constant: Speed, Stillness and the Cross

> ✦ **Practice: The Still Point**
>
> Sit comfortably. Let the breath go out, slowly and fully, without pushing.
>
> At the end of the out-breath there is a moment before the next breath begins.
>
> Do not hold it. Only notice it.
>
> Do this for five breaths.
>
> Rest, and breathe normally.

PASS 6: Memory: What Light Carries

> ✦ **Practice: Old Light**
>
> On a clear night, find one star. Any star.
>
> Let the breath be easy, and rest your eyes on it for seven breaths.
>
> Remember once that this light left before you were born, perhaps long before.
>
> It has arrived now, in your eye, and nowhere else.
>
> Rest, and breathe normally.

PASS 7: The Wave: Two Fields and the Serpent of Light

> ✦ **Practice: Two Ripples**
>
> Fill a wide bowl with water and let it settle.
>
> Touch the surface gently with one fingertip, and watch one breath of rings.
>
> Then touch it with two fingertips, a hand's width apart.
>
> Watch where the rings cross, for five easy breaths.
>
> Rest, and breathe normally.

PASS 8: Living Light: The Glow That Needs Breath

> ✦ **Practice: The Loop**
>
> Sit near a living plant, indoors or out.
>
> Breathe out slowly toward it, and know that it can use what you give.
>
> Breathe in, and know that the oxygen in this breath was freed by a green cell, somewhere, in the light.
>
> Do this for seven easy breaths.
>
> Rest, and breathe normally.

PASS 9: The Vesica: The Lens, the Eye and the Window

> ✦ **Practice: The Room of the Eye**
>
> Sit facing a window in daylight. Do not face the Sun.
>
> Close your eyes and let three easy breaths pass. Notice the glow through the lids.
>
> Open your eyes slowly on an in-breath, and let the room arrive.
>
> Know that it has arrived upside down, and that you have turned it without trying.
>
> Rest, and breathe normally.

PASS 10: Dark Light: The Shadow, the Ring and the Unseen

> ✦ **Practice: Reading the Dark**
>
> On a clear night, away from lamps if you can, let your eyes rest on the sky for some minutes.
>
> Do not look for stars. Look at a dark place between them.
>
> Let ten easy breaths pass. The eyes will open further on their own.
>
> Notice what the dark begins to hold.
>
> Rest, and breathe normally.

PASS 11: Starlight: The Descent of Light

> ✦ **Practice: Made of Stars**
>
> Sit quietly and rest a hand on your chest.
>
> On the in-breath, remember that the oxygen entering was made in a star.
>
> On the out-breath, remember that the carbon leaving was made in a star.
>
> No more than that, for seven easy breaths.
>
> Rest, and breathe normally.

PASS 12: Inner Light: The Eye, the Clock and the Luminous Mind

> ✦ **Practice: Thirteen and Eight, Without Holding**
>
> Sit comfortably with eyes closed.
>
> Breathe in gently to a slow count of five, and out to a slow count of eight. Do not hold at either end.
>
> After thirteen breaths, stop counting and let the breath go its own way.
>
> Notice the faint light behind the eyelids.
>
> Rest, and breathe normally.

PASS 13: Illumination: The Word, the Lamp and the Laser

> ✦ **Practice: In Step**
>
> Sit with one other person, or with a ticking clock if you are alone.
>
> Let your breath be easy. Without forcing, let it begin to fall in with theirs, or with every fourth tick.
>
> Stay for thirteen breaths.
>
> Notice what changes when two rhythms keep step.
>
> Rest, and breathe normally.

CODA: The Fourteenth Pass: Return to the Point

> ✦ **Practice: Receiving**
>
> Sit where daylight falls, with the Sun out of your view.
>
> Let the eyes rest half open on nothing in particular.
>
> For as many easy breaths as you like, do not look at anything. Let the light come to you.
>
> When you are ready, close your eyes and rest.

TURNING 1: The First Catch: One Photon, One Electron

> ✦ **Practice: What Is Caught**
>
> Look at a leaf in daylight for three easy breaths.
>
> The green you see is the light the leaf did not take.
>
> Rest, and breathe normally.

TURNING 2: The Leaf: A Spiral Made for Light

> ✦ **Practice: The Faithful Turn**
>
> With a pencil, place a dot. Turn the page a little more than a third of a circle and place another, slightly further out.
>
> Keep the same turn for thirteen dots, one to a breath.
>
> See what begins to appear.
>
> Rest, and breathe normally.

TURNING 3: Splitting Water: Where the Oxygen Comes From

> ✦ **Practice: Four Beats**
> Breathe in gently for a count of four, and out for a count of four, with no holding.
> After four rounds, let it go.
> Somewhere a leaf has just finished the same count.
> Rest, and breathe normally.

TURNING 4: The Two Engines: A Wheel in Every Cell

> ✦ **Practice: The Wheel**
> Rest a hand on your belly and breathe easily for seven breaths.
> In every cell beneath your hand, wheels are turning on the breath you just took.
> Rest, and breathe normally.

TURNING 5: A Tree Is Made of Air

> ✦ **Practice: Breathing with a Tree**
> Stand near a tree. Breathe out slowly toward it.
> Some of what you give, it will keep, and build with.
> Stay for seven breaths.
> Rest, and breathe normally.

TURNING 6: Stored Sunlight: The Food and the Fire

> ✦ **Practice: Grace**
> Before one meal today, pause for a single easy breath.
> Trace the food back, in your mind, to a leaf in the Sun.
> Then eat.

TURNING 7: The Coral: Two Lives and a City of Stone

> ✦ **Practice: The Third**
> Bring to mind one thing you have made with another person that neither could have made alone.
> Hold it in mind for five easy breaths.
> Rest, and breathe normally.

TURNING 8: Other Catchers: The Many Ways of Taking Light

> ✦ **Practice: Warmth**
> Stand in daylight with your back to the Sun for five easy breaths.
> Feel the warmth on your shoulders. That is light being taken in, the simplest way there is.
> Rest, and breathe normally.

TURNING 9: The Human and the Light

> ✦ **Practice: Morning Light**
>
> In the morning, stand outdoors or at an open window for some minutes. Never look at the Sun.
>
> Let the light reach your face and your open eyes, indirectly.
>
> Breathe easily. Your body is setting its clock.
>
> Rest, and breathe normally.

TURNING 10: Life Without Light: An Honest Shadow

> ✦ **Practice: The Edge**
>
> Sit in a darkened room for ten easy breaths.
>
> You are still breathing oxygen that light set free.
>
> Rest, and breathe normally.

TURNING 11: Mass Is Energy Held

> ✦ **Practice: Weight**
>
> Sit, and feel your weight on the seat for five easy breaths.
>
> Nearly all of that weight is motion, held still.
>
> Rest, and breathe normally.

TURNING 12: The Empty Atom and the Vibrating World

> ✦ **Practice: The Hum**
>
> With lips closed, hum gently on one easy out-breath. Do not push.
>
> Feel the vibration in the chest and face.
>
> Let it fade into silence, and rest.

TURNING 13: Light Into Matter

> ✦ **Practice: Two Hands**
>
> Bring your two palms slowly together on an out-breath, until they touch.
>
> Feel the warmth between them for three easy breaths.
>
> Open them on an in-breath.
>
> Rest, and breathe normally.

CHAPTER 9: The Skin: Where Sunlight Becomes a Messenger

> ✦ **Practice: The Short Sun**
>
> This is not medical advice. If you have had skin cancer, take medicines that make skin sensitive, or have been told to avoid the Sun, follow that advice.
>
> Otherwise, on a bright day, let the Sun reach your bare forearms or face for a few minutes only. Never look at the Sun. Never stay until the skin reddens.
>
> Breathe gently, and never force or hold the breath.
>
> Know that in these minutes a ring is opening in the skin, and that your own warmth will finish the work tonight.
>
> Step into the shade. Rest, and breathe normally.

CHAPTER 10: Every Surface: What Absorbed Light Becomes

> ✦ **Practice: Three Surfaces**
>
> In daylight, find a stone, a leaf and your own hand.
>
> Touch the stone. Its warmth is light, received.
>
> Look at the leaf. Its green is light, declined, and inside it sugar is being made.
>
> Look at your hand. Breathe gently, and never force or hold the breath.
>
> One light, three surfaces, three answers. Rest.

CHAPTER 11: The Boundary: Where Two Meet

> ✦ **Practice: The Water's Edge**
>
> Stand by still water in daylight, or hold a glass of water at a window.
>
> See three things: the sky turned back from the surface, the bottom seen bent through it, and the bright line of the surface itself.
>
> None of the three is in the air. None is in the water.
>
> Breathe gently, and never force or hold the breath.
>
> Ask: at what edge in my life is a third thing waiting to be made? Rest.

CHAPTER 15: Where Light Stands: The Open Question in Thirteen Breaths

> ✦ **Practice: The Open Centre**
>
> Sit in daylight with the Sun out of view. Let the eyes rest half open.
>
> Breathe gently, and never force or hold the breath.
>
> Know that at the centre of each eye is an opening with nothing in it, and that everything you see has come through.
>
> For thirteen easy breaths, let it. Then rest, and breathe normally.

> ✦ **Practice: Completing the Light**
>
> Sit where daylight reaches you, with the Sun out of view. Let the eyes rest half open.
>
> On the in-breath, know that this light has travelled eight minutes to arrive.
>
> On the out-breath, know that it has arrived, and that its journey ends in you.
>
> Stay for thirteen easy breaths. Then rest.

APPENDIX E

For the Reviewer: Where This Study Is Most Likely to Be Wrong

This study asks to be checked. A reviewer's time is best spent where the risk is highest, so the places are listed here.

Findings that are new, disputed or resting on one study

- **Quantum coherence in photosynthesis** (Turning 1). Reported in 2007, largely revised since. Check that the text does not overstate it.
- **Oxygen made in the dark on the sea floor** (Turning 10). A 2024 claim, strongly disputed.
- **Light evaporating water without heat** (Chapter 10). Reported 2023 and 2024 by one group; not independently settled.
- **Ultraviolet exposure and longer life** (Chapter 9). Two observational studies. A link, not a cause.
- **Vitamin D and autoimmune disease** (Chapter 9). One large trial.
- **Nitric oxide from skin** (Chapter 9). Small studies; a later trial found the effect brief.
- **Skin clocks and the skin's opiate** (Chapter 9). Shown in mice. The text should not imply more for people.
- **Red and near-infrared light on cells** (Turning 9). A few accepted uses; many unproven claims.
- **The side-products of previtamin D** (Chapter 9). Long called inert; newer work suggests otherwise.

Numbers and dates worth checking against their sources

- Eighty-four percent of reef area under bleaching-level heat, 2023 to 2025 (Turning 7).
- More than 6,000 electron and positron pairs in the 2021 experiment (Turning 13).
- About 99 percent of ordinary mass as energy held (Turning 11).
- The peak near 297 billionths of a metre, and the balance at a tenth to a seventh (Chapter 9).
- Vitamin E at the skin's surface: nearly half used up under a lamp (1998), and a half to two thirds in half an hour of midday Sun (a small 2004 study from a skin-care laboratory) (Chapter 9).
- The 395,000 people of the 2024 study and the 24 volunteers of the 2014 study (Chapter 9).
- Ibn Sahl, 984; Theodoric and al-Farisi, about 1300; Śniadecki, 1822; Wheatstone, 1838; Huldschinsky, 1919; the surface wave, 1957; the jaundice finding, 1956, published 1958; the second and the metre, 1967 and 1983.
- Every figure given in Part One for places and alignments.

Simplifications made for plain language

- "Particles are ripples in fields" and "light carries the electric force" are the standard picture, stated without its mathematics.
- "Atoms are mostly empty" is weighed in Turning 12; the weighing should be read with the sentence.
- "Light on loan" and "light received" are ways of speaking about energy that is absorbed and later given off.

Readings where the mirror is most likely to have agreed too easily

- That the seven illuminations rest on three, and that the three match those of *One Breath, Read Whole* (Chapter 14). The same author and mirror made both.
- That "Light Received" is the third of the two reflections (Chapters 12 and 16).
- That the third is made at the edge, as a rule beyond optics (Chapter 11 and the seventh illumination).
- That the centre is kept empty so that light can pass through (Chapter 15). An AI asked about light after a study of light will tend to rank it high.
- The fitting of each pass and each turning to its Moon. The Moons were the frame; a frame of thirteen will always be filled.

What a reviewer is asked

Where is a grade too generous? Where does a near-truth lean on a claim that failed? Where has a symbolic reading been allowed to sound like a finding? And what has been left out that would change the picture?

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In Harmony, Small Things Grow Towards Unity

With kindness, gratitude and coherence,
Keith Shirley

About the Author

Keith Shirley is a scribe and a contemplative, not a physicist, an astronomer or a historian. He describes his part in this study as listening, reflecting and writing down, in conversation with other people's work.

His first career was in the practical world of finance, public works and real estate in Boston. A long journey of healing, which took him from Boston to Portland, Oregon, and to Peru, turned him toward the breath. He trained as a Gene Keys Guide and works as an Akashic Records consultant.

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