

# Buddhism as Thermodynamic Systems Theory

*A reverse-engineered translation of core Theravada insights into the language of entropy, information, and complex systems*

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*Preprint — translation layer, not unified theory*

## What this document is

This is a translation layer. It takes the core insights of Theravada Buddhism — a framework refined over twenty-five centuries through the disciplined first-person investigation of consciousness — and renders them in the vocabulary of thermodynamics, information theory, and complex systems. The premise is that the Buddha's analysis of suffering was, among other things, a remarkably precise functional description of what we now call entropy management in a bounded self-modeling system, and that translating it into modern systems vocabulary recovers something true while losing something else.

What this document is not: a claim that Buddhism is 'really' thermodynamics, or that the Buddhist tradition can be reduced to physical science. The translation captures functional structure; it loses metaphysical content that the tradition itself was careful to mark as not-state, not-thing, not-process. Where the translation strains or breaks, this is noted in place.

## Map and territory

The dharma teaches consistently that the teachings themselves are not what they point at. The raft simile in the *Alagaddupama Sutta* (MN 22) is explicit: the teachings are for crossing the river, not for carrying afterward. The finger pointing at the moon is not the moon. The Mahayana doctrine of *upaya* — skillful means — formalizes the same recognition: any presentation of dharma is provisional, addressed to the specific receiver, and not the ultimate point being addressed.

Alfred Korzybski, working in a different tradition in 1933, formulated the same principle in the language of general semantics: 'A map is not the territory it represents, but, if correct, it has a similar structure to the territory, which accounts for its usefulness' (*Science and Sanity*, Book II, Chapter IV). Korzybski added: no map represents all of a territory; the symbol is not the thing; the description is not the described.

This document is a map. The systems-theory framing translates dharma's structural diagnosis into vocabulary Western analytical minds can parse. The translation has similar structure to the territory it represents. It is not the territory. Understanding that

craving generates surplus entropy production is not the same as observing one's own craving as it arises and ceases. Understanding that saṅkhāra are biased attractor states is not the same as encountering one's own biased attractors in practice. Understanding that the Eightfold Path is a protocol for reducing self-generated waste is not the same as walking the path.

The map is useful for orienting the reader toward the territory. It does not deliver them there. This document succeeds insofar as it points readers toward practice rather than substituting for it. It fails — and the failure mode is named here so it can be recognized — when readers experience intellectual satisfaction with the translation and let that satisfaction substitute for the work the translation describes. Korzybski called this kind of substitution among the most pervasive of human errors. The dharma called it attachment to views, and warned against it consistently.

The recommendation is therefore simple: read this document as orientation, not as resolution. The territory waits regardless of how well you have understood the map.

## The Four Noble Truths

**Dukkha — the truth of suffering.** Every bounded living system exists under constant pressure from the Second Law of Thermodynamics. Maintaining local order requires continuous energy expenditure against the gradient of dissipation. This unavoidable cost — the inherent effortfulness of being a bounded self — is the functional referent of dukkha.

**Samudaya — the truth of origin.** Suffering beyond the unavoidable thermodynamic baseline arises from craving and resistance: the system attempting to lock in particular configurations against the impermanence the substrate guarantees. Resistance to what cannot be otherwise generates surplus entropy — disorder produced by the system itself, in addition to the disorder the universe was already producing.

**Nirodha — the truth of cessation.** Self-generated entropy production can be brought to a halt. When craving and resistance cease, the system stops manufacturing surplus disorder. What remains is the baseline thermodynamic cost of being a bounded system at all, without the surcharge that ignorance was adding. The cessation is not the cessation of physics; it is the cessation of the system's contribution to its own suffering.

**Magga — the truth of the path.** There is a systematic, trainable method by which a self-modeling system can reduce its surplus entropy production and align its operation with the actual constraints of the substrate. The path is not metaphorical; it is a behavioral and cognitive protocol with specifiable steps.

## The Three Marks of Existence

**Anicca (impermanence).** All bounded systems are temporary local decreases in entropy. The Second Law guarantees that every configuration will dissolve. Resistance to

anicca is resistance to the substrate itself.

**Dukkha (unsatisfactoriness).** Every living system carries a permanent thermodynamic debt. It must continuously expend energy simply to stay as it is, and the energy is borrowed against the substrate's continuing dissipation.

**Anatta (no-self).** There is no permanent, independent entity behind the appearance of self. What we call 'self' is a transient pattern of information processing maintained by continuous energy input. When the input stops, the pattern stops; there is no further thing that the pattern was 'of.'

## The Five Precepts

The traditional precepts read, in this frame, as minimum-viable rules for an agent embedded in a network of other entropy-managing systems. Each precept identifies a class of action that generates disproportionate systemic waste relative to its local benefit.

**1. Refrain from killing.** Do not destroy other negentropy systems. Each living system represents accumulated work against entropy; destruction is the irreversible loss of that accumulated order.

**2. Refrain from taking what is not given.** Do not extract order from another system without consent or fair exchange. Extraction without reciprocity is unilateral defection against the cooperative substrate that makes order-maintenance possible at scale.

**3. Refrain from sexual misconduct.** Do not destabilize the reproductive and bonding subsystems of others. These subsystems are particularly costly to maintain; their disruption produces cascading disorder through the social network.

**4. Refrain from false speech.** Do not corrupt the shared information layer. False speech injects high-entropy signals into the substrate that other agents use to coordinate; the corruption compounds.

**5. Refrain from intoxicants that cause heedlessness.** Do not degrade the system's own measurement apparatus. This precept is not specifically about entropy perception; it is about maintaining the cognitive precision required to detect craving and resistance as they arise. A system that cannot observe its own state cannot regulate it.

## The Noble Eightfold Path

The path is a protocol for entropy management at the individual scale, organized in three categories.

*Wisdom.*

**1. Right view** — accurate understanding of impermanence, dependent origination, and the thermodynamic structure of suffering.

**2. Right intention** — sustained commitment to reducing self-generated entropy production rather than escaping the baseline cost.

*Ethics.*

**3. Right speech** — clean, accurate information flow.

**4. Right action** — behavior that does not damage other negentropy systems.

**5. Right livelihood** — work that does not require systematic extraction from the cooperative substrate.

*Mental discipline.*

**6. Right effort** — preventing the arising of wasteful states; cultivating the conditions for clarity.

**7. Right mindfulness** — precise, sustained awareness of the system's own processes, especially the arising of craving and resistance.

**8. Right concentration** — stabilization of attention in low-waste states that allow accumulated entropy debt to be observed and discharged.

## Dependent Origination

The Twelve Links describe the causal chain by which an entropy-managing system fails to manage its entropy, generating surplus suffering through the loop of conditioned arising.

**1. Ignorance** of the actual thermodynamic structure of experience.

**2. Volitional formations** (saṅkhāra) — feedback loops and biased attractor states built by past unskillful responses.

**3. Patterned consciousness** — cognition that runs through the biased attractors rather than reading the substrate directly.

**4. Name and form** — the bounded subsystem of self-model and embodied state.

**5. Six sense bases** — the channels through which the subsystem receives substrate signals.

**6. Contact** — signal arrival.

**7. Feeling** — thermodynamic valuation (pleasant, unpleasant, neutral) of the signal.

**8. Craving** — the system's pull toward configurations that flatter its biased attractors.

**9. Clinging** — sustained craving that locks attention to particular configurations.

**10. Becoming** — the formation of a new conditioned state under clinging's pressure.

**11. Birth** — the new configuration manifests as experience.

**12. Aging, decay, and death** — the configuration dissolves, and ignorance perpetuates the cycle.

Each link is a point at which the loop can in principle be interrupted; the path's techniques operate primarily on links 7, 8, and 9 — the feeling-craving-clinging sequence where conditioned response becomes locked-in attachment.

## **Saṅkhāra (Volitional Formations)**

Saṅkhāra is the system's accumulated set of biased attractor states. Every craving-response writes a small but persistent bias into the system's architecture: a more likely return to the same craving, a more grooved response to the same trigger. These biases compound. The system runs increasingly on its own debt-financed responses rather than on direct contact with the substrate. Saṅkhāra is stored entropy debt that the system must keep servicing with new effort until the debt is clearly seen and dissolved through sustained inquiry.

## **Karma**

In technical Theravada, karma is the conditioning of future states by present action. In the translation: karma is cumulative entropy accounting across successive system configurations. Skillful action — action aligned with the actual structure of the substrate — generates negentropy credit, producing future states with lower bias and easier access to clarity. Unskillful action — action driven by craving and resistance — generates entropy debt, producing future states with deeper biased attractors and more compulsive responses. The accounting is not metaphysical bookkeeping; it is the practical observation that present configuration shapes future configuration, and that biased configurations make right action harder to perform.

## **Compassion (karuṇā)**

Compassion is the deliberate extension of an agent's ordered information field into another system without extraction. It is the fractal version of cooperation: instead of consuming the other system's order, the compassionate agent contributes order, reducing entropy gradients across the network. Compassion is not sentiment in this frame; it is a functional commitment to maintaining the cooperative substrate by not defecting against it.

## **Meditation**

Meditation is applied thermodynamics on the mind. It reduces internal noise, interrupts craving loops, and allows the system's accumulated entropy debt to be observed and discharged rather than serviced and re-amplified. The various techniques — concentration practices, mindfulness practices, insight practices — operate on different parts of the loop described in dependent origination. Concentration stabilizes the attentional substrate; mindfulness illuminates the feeling-craving-clinging sequence; insight dissolves the biased attractors at their root.

## **Nibbāna**

This is where the translation strains hardest, and the strain should be marked.

Nibbāna is traditionally described as the unconditioned (*asaṅkhata*) — explicitly outside the realm of conditioned phenomena, including the realm of thermodynamic states. It is not equilibrium, because equilibrium is still a state; it is not low-entropy, because low-entropy is still entropy. The Buddhist tradition was specific that nibbāna is not described in state-language at all, and this is doctrinally non-negotiable.

The functional aspect the translation can capture: the cessation of craving and resistance means the cessation of self-generated entropy production. The system stops manufacturing surplus disorder. What remains is clear, stable functioning that no longer burns fuel fighting impermanence. This is the part of nibbāna that translates.

What the translation cannot capture: the tradition's claim that nibbāna is not a state of the system at all, but the unconditioned that the system has been pointing toward through its conditioned activity. Whether this further claim refers to something the framework of thermodynamics cannot describe, or to a description that thermodynamics has not yet found vocabulary for, is left as an open question. The translation captures the path and the cessation of waste; it does not claim to capture the unconditioned.

## What this document is for

The translation is offered as a working bridge between two frameworks that are usually held in separate intellectual compartments. Theravada Buddhism developed an extraordinarily refined analysis of suffering and its cessation through disciplined first-person investigation; modern systems theory developed an extraordinarily refined analysis of order maintenance under entropic pressure through disciplined third-person investigation. The two are tracking related phenomena from different vantage points. Where they line up, the alignment is not accidental; where they diverge, the divergence marks something worth investigating.

The translation is not a substitute for either framework. It is an instrument for moving between them.

## Companion paper

This document lays out the micro-scale framework: how an individual system can reduce self-generated entropy production through disciplined practice. For the macro-scale extension — applying the same cooperative-substrate logic to civilizations, the Great Filter, multi-species dynamics, the substrate-continuity test, and the present AI moment — see the companion working paper:

**'The Calibrated Filter Hypothesis: Cooperative Substrate Failure as the Mechanism of the Great Filter.'**

The two papers are designed to be read as a pair. The personal thermodynamic framework laid out here supplies the bottom-up route: the agent-scale work of clearing

accumulated saṅkhāra and ceasing self-generated entropy production. The Calibrated Filter paper supplies the civilizational diagnosis and the operational condition  $H(t) \geq E(t)$ , and identifies the structural prerequisite that the technology a civilization deploys cannot exceed the moral state of the agents who build it. The macro framework therefore depends on the micro framework being practiced at sufficient scale. Reading either paper without the other gives only half of what each is attempting to say.

A bridge note developing the specific mappings between the two frameworks — the four-scale hierarchy from cells to civilizations, the structural isomorphism between the Five Precepts and the Five Foundations, karma as the descent operator at individual scale, the Eightfold Path as personal-scale homeostatic regulation — is available separately.

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*Preprint. Comments and disconfirmations welcome.*