The Crucible

Project and Set Descriptions

Updated draft with revised Project 1 and Project 2 structures

Draft overview for proofing
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1. Orientation

This document provides a concise orientation to the full Crucible study. It describes the purpose of each project and each phase or set before the corresponding results are examined in detail. The descriptions are written as front matter for a scientific study: they introduce the experimental intent, the broad conditions being tested, and the role each set plays in the larger sequence.

The Crucible is a simulated world in which agents act over repeated time steps called pulses. The world engine is the logical system that processes those pulses: it applies movement, energy use, reproduction, death, cooperation, defection, environmental change, and technological or social transitions. After the term is established, this document may refer to the world engine simply as the engine.

The central subject of the Crucible is not a single agent but the behavior of tribes: groups of agents that carry inherited behavioral tendencies. A phase or set is a block of epochs run under related conditions. Each epoch is one complete simulation run. The project sequence begins with baseline world behavior, then moves through competition, redesign, abrupt environmental shocks, and finally post-collapse projection.

This revised draft updates Project 1 to match the revised execution structure: baseline, bottleneck, duel, harsher climate-chaos, and gentler climate-chaos. It also retains the corrected Project 2 all-LLM solo and triad structure.

2. Terms used in this document

These terms are included to make the descriptions readable without requiring the detailed technical reports. The terms describe simulation structures and outputs, not real-world groups or social categories.

Term	Meaning
Agent	An individual simulated actor whose movement, energy use, cooperation, defection, reproduction, and death are processed by the world engine.
Tribe	A population of agents sharing a behavioral design. In later projects, different tribes represent distinct design hypotheses.
Epoch	One complete simulation run under a defined condition or set of conditions.
Pulse	A time step in the simulation. At each pulse, the world engine updates agent and environmental state.
Regime	A broad level of social and technological complexity: Regime 1 (Foraging), Regime 2 (Agrarian), Regime 3 (Industrial), and Regime 4 (Technological).
Prisoner's Dilemma	The repeated cooperation-or-defection interaction used to model strategic behavior under survival pressure.
Refugium / refugia	A surviving pocket or set of pockets after a larger collapse wave.
Set / phase	A named block of epochs with a shared experimental purpose.
Climate reservoir	A delayed or persistent climate-feedback store that can continue influencing the world after the immediate human-caused pressure has changed.

The descriptions that follow use these terms in their model-specific sense. They are intended to guide the reader into the later evidence sections without presenting results or conclusions.

3. Project 1 - Baseline Crucible

Project 1 - Baseline Crucible

Epochs 1-50

Project 1 establishes the first structured baseline for the Crucible. It uses the frozen candidate world engine to observe how a full tribe library behaves under standard world conditions, under severe geographic bottleneck conditions, in a controlled two-tribe duel, and under harsher or gentler climate-chaos settings. The project is designed to establish the core reference pattern for later work: whether the simulated world reliably produces agrarian bottlenecks, fossil-energy overshoot, complexity growth, peak-oil stress, climate-chaos collapse, and post-collapse refugia. It also tests whether geography, tribe count, and Prisoner's Dilemma strategy can preserve diversity or whether they mainly delay winner-take-all selection.

Project 1 does not include a separate fragmented-fertile-basin phase in the revised structure. The baseline Holocene mechanic already creates multiple fertile clusters or valleys, so the structured Project 1 sequence focuses on baseline behavior, bottleneck geography, duel competition, and climate-chaos severity.
The phase descriptions below introduce the objective of each set within this project. They do not summarize outcomes.

Baseline World

Epochs 1-10

This set establishes the reference world using twenty-two active tribes and normal geography. It observes the baseline behavior of the frozen world engine with the full tribe library: early growth, the agrarian bottleneck, one-tribe monopoly pressure, death causes, climate-chaos exposure, final refugia, civic identity signals, and Prisoner's Dilemma outcome balance.

Bottleneck World

Epochs 11-20

This set keeps the twenty-two-tribe field but changes the geography to a near-total mountain barrier with one pass. Its purpose is to test whether severe geographic separation preserves strategic and tribal diversity, creates delayed contact, permits independent agrarian emergence on both sides, or merely postpones global consolidation by a single winner.

Duel World

Epochs 21-30

This set reduces the world to a controlled two-tribe strategic duel inside the one-pass bottleneck geography. It tests whether first agrarian capture, delayed contact, asymmetric growth, and Prisoner's Dilemma behavior determine whether the final state is coexistence, monopoly, or extinction of one lineage.

Harsher Climate-Chaos World

Epochs 31-40

This set restores the twenty-two-tribe field and default geography while increasing climate-chaos severity. Its purpose is to test how much post-collapse survival depends on intensified volatility, food-system instability, regional chaos, and late refugia failure or persistence.

Gentler Climate-Chaos World

Epochs 41-50

This set also uses the twenty-two-tribe field and default geography, but softens climate-chaos severity. Its objective is to test whether civilization still overshoots and collapses when climate volatility is less destructive, and whether population or complexity remains stable for longer under reduced environmental stress.

4. Project 2 - Competition

Project 2 - Competition

Epochs 51-100

Project 2 turns the Crucible into a controlled all-LLM competition study. It begins with solo viability runs for the two anchor tribes, Aurora and The Phalanx, then moves into pairwise duels that form two triads: Aurora / The Phalanx / Fractal Phoenix, and SYMBIONT-ZERO / Helix Vanguard / The Resonant Meridian. The objective is to separate basic environmental viability from competitive failure, and to test whether pairwise outcomes form a stable hierarchy, a non-transitive cycle, or an opponent-specific pattern.

The phase descriptions below introduce the objective of each set within this project. They do not summarize outcomes.

Aurora Solo Viability

Epochs 51-60

This set tests whether Aurora can survive the baseline Project 2 world without competitors. Its purpose is to establish whether later duel losses, if they occur, are likely caused by competition or by Aurora's own environmental ceiling.

The Phalanx Solo Viability

Epochs 61-70

This set performs the same solo viability test for The Phalanx. It creates the second anchor benchmark before Aurora and The Phalanx are placed into direct competition.

Aurora vs The Phalanx

Epochs 71-75

This set begins the pairwise competition phase. It tests whether a new all-LLM duel produces a decisive one-sided result, without reusing the earlier Project 1 duel pair.

The Phalanx vs Fractal Phoenix

Epochs 76-80

This set tests the second edge of the first triad. It examines how The Phalanx performs against Fractal Phoenix, creating the middle comparison needed for a transitivity check.

Aurora vs Fractal Phoenix

Epochs 81-85

This set closes the Aurora / The Phalanx / Fractal Phoenix triad. Its purpose is to test whether the first triad forms a linear hierarchy or a non-transitive competitive pattern.

SYMBIONT-ZERO vs Helix Vanguard

Epochs 86-90

This set opens the second independent all-LLM triad. It provides a new pairwise comparison outside the Aurora / The Phalanx / Fractal Phoenix group.

Helix Vanguard vs The Resonant Meridian

Epochs 91-95

This set tests the second edge of the D/E/F triad. Its purpose is to evaluate whether Helix Vanguard behaves as a bridge, a weak link, or a dominant competitor within that triad.

SYMBIONT-ZERO vs The Resonant Meridian

Epochs 96-100

This set closes the second triad. It tests whether the D/E/F outcomes form a linear hierarchy or a non-transitive cycle.

5. Project 3 - Evolution

Project 3 - Evolution

Epochs 101-140

Project 3 treats tribes as design hypotheses that can be examined, compared, and redesigned. The project moves from evidence gathering to a structured sequence of generational redesigns. Its purpose is to study how survival strategies change when previous outcomes are used to inform new tribe designs, while the future behavior of those designs is still left to unfold inside the world engine.

The phase descriptions below introduce the objective of each set within this project. They do not summarize outcomes.

G1 Evidence Universe

Epochs 101-110

This set creates the first broad evidence universe for the redesign project. It gives the initial generation of tribes a shared world in which their strengths, weaknesses, and failure modes can become visible.

Matched G1 Baseline

Epochs 111-120

This set creates a more controlled baseline for the first generation. Its objective is to make the comparison fairer and clearer before the first redesign step is judged against the original field.

G2 First Redesign

Epochs 121-130

This set introduces the first redesigned generation. The objective is to test whether changes based on the G1 evidence improve survival logic, competitive behavior, and continuity through stress.

G3 Second Redesign

Epochs 131-140

This set introduces the second redesigned generation. It is intended to sharpen the surviving design theories and identify which kinds of behavioral architecture remain plausible as the project approaches more extreme conditions.

6. Project 4 - Bombs

Project 4 - Bombs

Epochs 141-180

Project 4 introduces abrupt external shocks, called bombs, into the Crucible. These are not ordinary background pressures but sudden or concentrated disruptions to the world. The project is designed to test how tribe behavior and world stability respond when the collapse environment is shaped by specific high-impact physical or climatic events.

The phase descriptions below introduce the objective of each set within this project. They do not summarize outcomes.

Aerosol Demasking

Epochs 141-150

This set examines the consequences of rapidly revealing warming that had previously been masked by atmospheric aerosols. Its objective is to test how a sudden shift in visible climate pressure changes the survival environment.

Arctic Methane Release

Epochs 151-160

This set focuses on a methane-release shock from the Arctic system. The objective is to introduce a concentrated climate-feedback event and study how the world responds to that additional forcing.

Nuclear Meltdown

Epochs 161-170

This set introduces a technological and environmental disaster condition. Its objective is to test a collapse pathway driven by infrastructure failure and contamination rather than by gradual environmental pressure alone.

Stacked Bombs

Epochs 171-180

This set combines multiple shock families into a stacked crisis. Its objective is to examine whether overlapping disruptions produce different survival conditions than single-bomb scenarios.

7. Epilogue

Epilogue

Epochs 181-241

The Epilogue shifts the study from collapse competition to post-collapse projection. It asks what kind of future unfolds after the old world has broken: whether tribes restart, stabilize, disappear, continue fighting, or persist as small refugia. The agents and tribes enter this stage with inherited behavioral designs, while the conditions of network collapse, duration, and climate feedback are varied to explore different post-collapse futures.

The phase descriptions below introduce the objective of each set within this project. They do not summarize outcomes.

Aries Field Test

Epochs 181-190

This set introduces Aries as a deliberate successor design to the earlier survival theories. Its purpose is to test a designed post-collapse tribe against the established field before moving into longer and more uncertain future projections.

Natural Network Collapse

Epochs 191-200

This set allows Internet and telecom connectivity to end naturally as the simulated world declines. The objective is to examine whether reduced long-distance contact changes the post-collapse social landscape and the possibility of separated refugia.

Eighty-Thousand-Pulse Extension

Epochs 201-210

This set extends the time horizon to 80,000 pulses. Its purpose is to distinguish temporary remnants from longer-duration post-collapse states by giving surviving populations more time to stabilize, decline, or restart.

Simple Climate Tail

Epochs 211-220

This set introduces a simpler form of continuing climate pressure after collapse. The objective is to test whether a basic post-collapse climate tail changes the future path without yet using the more detailed reservoir structure.

Climate Reservoir Calibration

Epochs 221-230

This set tests the more detailed climate-reservoir mechanics. Its purpose is methodological and exploratory: to verify that delayed climate feedbacks can be represented, archived, and interpreted before using them as the final Epilogue climate condition.

Final Climate Reservoir Projection

Epochs 231-240

This set applies the final selected climate-reservoir envelope to the full tribe field. Its objective is to project tribe behavior through a large boom, hard crash, and long survivable tail under persistent physical feedback.

Supplemental Reservoir Check

Epoch 241

This single epoch is treated as a supplemental run outside the clean ten-epoch phase structure. Its purpose is to preserve the complete historical record while separating the extra run from the main 231-240 Final Climate Reservoir Projection set.