

# Neanderthal (living rules, all editions)

A card game of the origins of culture for 1 to 3 players.

Design: Phil Eklund Version: Mar 27, 2018 Copyright © 2015 Sierra Madre Games

Graphics and Iconography: Karim Chakroun

Rules Editor: Kyrill Melai

Playtesters: Christopher Leko [Mathew Tate](mailto:Mathew Tate) [mathewtate@hotmail.com](mailto:mathewtate@hotmail.com) (solitaire), [Drake Immortalis](mailto:Drake Immortalis) [drakeimmortalis@gmail.com](mailto:drakeimmortalis@gmail.com), [Andy Graham](mailto:Andy Graham) [agraham2410@gmail.com](mailto:agraham2410@gmail.com), [Chuck Parrott](mailto:Chuck Parrott) [chuckparrott@earthlink.net](mailto:chuckparrott@earthlink.net), [Juan Crespo](mailto:Juan Crespo) [juanma99@hotmail.com](mailto:juanma99@hotmail.com), [Wulf Corbett](mailto:Wulf Corbett) [wulfc@wulf.demon.co.uk](mailto:wulfc@wulf.demon.co.uk), [William Hutton](mailto:William Hutton) [williamhutton@gmail.com](mailto:williamhutton@gmail.com), Dr. [Nicole Morper](mailto:Nicole Morper), [Matt Eklund](mailto:Matt Eklund), [Simon Skov Hansen](mailto:Simon Skov Hansen) (magenta font = active playtester with submissions), [chrisleko@gmail.com](mailto:chrisleko@gmail.com), [Michael Theiss](mailto:Michael Theiss) [paperemail11@yahoo.com](mailto:paperemail11@yahoo.com), [Maurizio Picanza](mailto:Maurizio Picanza) [maurizio.picanza@yahoo.com](mailto:maurizio.picanza@yahoo.com), [robert.s.slaughter@gmail.com](mailto:robert.s.slaughter@gmail.com), [David Kuznick](mailto:David Kuznick) [dkuznick@gmail.com](mailto:dkuznick@gmail.com), [Eric Gerber](mailto:Eric Gerber) [cgerber@socal.rr.com](mailto:cgerber@socal.rr.com), [Cole Wehrle](mailto:Cole Wehrle) [cwehrle@gmail.com](mailto:cwehrle@gmail.com), [Thompson Stubbs](mailto:Thompson Stubbs) [thompsonstubbs@gmail.com](mailto:thompsonstubbs@gmail.com), [Ken Southerland](mailto:Ken Southerland), [crowmagnumb@gmail.com](mailto:crowmagnumb@gmail.com), [Pete Grey](mailto:Pete Grey) [petegrey@gmail.com](mailto:petegrey@gmail.com), [Upkar Gata-Aura](mailto:Upkar Gata-Aura) [uppyg@yahoo.co.uk](mailto:uppyg@yahoo.co.uk), [bhurrel@yahoo.com](mailto:bhurrel@yahoo.com), [nicolai\\_thorning@hotmail.com](mailto:nicolai_thorning@hotmail.com), [Scott Henshaw](mailto:Scott Henshaw) [sahenshaw@gmail.com](mailto:sahenshaw@gmail.com), [Nigel Buckle](mailto:Nigel Buckle) [n.buckle@hotmail.com](mailto:n.buckle@hotmail.com), [Brett Burleigh II](mailto:Brett Burleigh II) [brr.rocket@gmail.com](mailto:brr.rocket@gmail.com),

German Translation: [Ray Horak](mailto:Ray Horak) [gheire@vorsicht-bissig.de](mailto:gheire@vorsicht-bissig.de)

French Translation: [Karim Chakroun](mailto:Karim Chakroun)

Italian Translation: [Riccardo Bux](mailto:Riccardo Bux)

[https://docs.google.com/document/d/1iBqZ4Mq7IyeB3aSFS1jbZDIS5MY9zN5Q6yHcUvEb-qq/edit?usp=drive\\_sdk](https://docs.google.com/document/d/1iBqZ4Mq7IyeB3aSFS1jbZDIS5MY9zN5Q6yHcUvEb-qq/edit?usp=drive_sdk)

Japanese Translation: [Masahiro Nakamura](mailto:Masahiro Nakamura)

Spanish Translation: [Manuel Suffo](mailto:Manuel Suffo)

Dutch Translation: [Filip Goussaert](mailto:Filip Goussaert)

Czech Translation: [David Hanáček](mailto:David Hanáček)

Statistics: [Pablo Klinkisch](mailto:Pablo Klinkisch)

Playtest sessions here:

<https://docs.google.com/spreadsheets/d/1sMP3RZ9bNf4X1dCW8Ysd989LzmtA3ZfwSxOZrIVQ4Xg/edit#gid=0>

Vassal Module 2.2, [Stefano Tiné](mailto:Stefano Tiné):

[http://www.vassalengine.org/mediawiki/images/4/4f/Neanderthal\\_2.2.vmod](http://www.vassalengine.org/mediawiki/images/4/4f/Neanderthal_2.2.vmod)

Rules changes in green font are changes between the 1st & 2nd editions. Changes since 2nd edition are in red font. Card Errata: "STRING-WINDING", there is missing the "3-dice > take into hand" icon that is present on all the other invention cards. This should be below the "1dice\* > black disk" icon.

## INTRODUCTION

*The biggest mystery in anthropology is what ignited the cultural revolution 45,000 years ago in Europe, when its upper half was covered with an ice-sheet. The Archaics, Neanderthals, and recently-arrived*

*Cro-Magnons<sup>1</sup>, who had never before left any record of art, religion, ritual, or science, and who had not altered their handaxe technology in a million years, suddenly exploded in a flurry of cave paintings, body adornments, carved venus figures, musical instruments, intentional burials, and new portable tools. And this revolution spread from one human species to another, each of whom had enjoyed large brains for a hundred thousand years without any prior cultural activity. Just what had they been doing with all that brainpower that had not manifested itself in a single new tool or behavior change detectable in the archeological record? This game suggests they were perfecting their language skills to a threshold point that opened portals between brain domains and enabled lingual fluidity.<sup>2</sup>*

## A. SUMMARY

The three players represent the Archaic Man<sup>3</sup> (Player Green), Neanderthal<sup>4</sup> (Player Yellow), and Cro-Magnon<sup>5</sup> (Player Red) species fighting to survive in Europe during the last glacial maximum from 45,000 to 35,000 years ago. You begin the game **vocal** (i.e. words for speech but not ideas) and with a **sexuality** (promiscuous, harem, or pair bonding). Your repertoire of orange, black, and white disks

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<sup>1</sup> HUMAN-NEANDERTHAL INTERACTION. A single tooth and a few bone fragments found in a cave in Bulgaria prove that modern humans reached Europe more than 45,000 years ago (45 kya). “Some believe the Neanderthals invented by themselves what we call the Upper Paleolithic, while others like me claimed it was the result of the arrival of modern humans. You have modern humans arriving between 47 and 45 kya in Eastern Europe and, bingo, at 44 kya the Neanderthals start to do things they never did before.” But by 39 kya, the Neanderthals were all but gone. —Jean-Jacques Hublin, Max Planck Institute for Evolutionary Anthropology, 2020.

<sup>2</sup> WHY A SUDDEN EXPLOSION OF CULTURE? To put this mystery in game context, suppose the game starts 120 kya instead of 45 kya, and each turn takes 1000 years. There are three huge-brained human subspecies, all clever enough to somewhat use fire and make multicomponent (hafted) stone tools and handaxes long before their brains were big. Yet there are other animals who have learned to exploit fire (e.g. an Australian fire-following hawk that has been observed to transport burning branches to start new fires) and make tools. As the game begins, the European Neanderthals are hunting big game with their hafted thrusting spears, alongside Archaics hunting smaller game with their javelins. Meanwhile the African *Homo sapiens* are spreading throughout the rest of the world, but for unknown reasons stay clear of frosty Europe. For the first boring 94 turns, there is no innovation, technology, art, or culture. But then (45 kya) “Cro-Magnon” from Africa finally meets Neanderthals in Europe, and for the next 6 game turns there is an interspecies revolution of culture and art. The Archaics may have already been extinct by this time, and by turn 100 the Neanderthals are also gone. By turn 135, the Pleistocene is over, replaced by the warm Holocene interglacial. Men are farming, settling in cities, throwing pots, and hunting with archery. On turn 148, Jesus is born, and turn 150 is now. What caused the breakthrough in turn 95?

<sup>3</sup> ARCHAIC HOMO SAPIENS (*Homo heidelbergensis*) refers vaguely to humans intermediate between *Homo erectus* and his presumed descendants: Neanderthal and Cro-Magnon. He could be a “garbage taxon”, a label for the museum drawer where all the skulls with a brain size between 1100 and 1400 cc are kept. But he seems to be a type of large-brained and robust *H. erectus* originating in Africa 500 kya (i.e. 500,000 years ago). Midway between Neanderthals and Cro-Magnons in height, by 300 kya he was hunting horses with javelins in Germany. European archaics spawned Neanderthals by 150 kya, and African archaics spawned *H. sapiens* by 120 kya.

<sup>4</sup> NEANDERTHALS are an extinct species of European and Near East hominids who lived from 150 to 40 kya. Their brain size of 1200 - 1750 cc is notably larger on average than our own. They have anatomical features adapted for living in glacial climates, with stout muscular bodies, barrel chests, and short legs. Their remains seem to have suffered a high degree of physical injuries (similar to those suffered by rodeo riders) and degenerative diseases. They died out 5000 years after Cro-Magnons reached Europe.

<sup>5</sup> CRO-MAGNON is just another name for our physical selves: *Homo sapiens* - anatomically modern humans with a brain size of 1200 - 1700 cc. But cognitively their minds were not as inventive or flexible as ours until the cultural revolution at 40 kya, about the time they first invaded Europe. By this time they had already been in Africa for 80,000 years, Asia for 60,000 years, and Australia for 20,000 years. Today, they are the only surviving members of the *Homo* lineage, albeit with admixtures of Neanderthal and Denisovan genes.

represents your **vocabulary** of social, technical, and nature words. Use them to establish immature **Elders** or **Husbands**, or to bid on cultures represented by **daughter cards**. Regain vocabulary by **hunting** Ice Age megafauna, which also gives you Babies for the next generation. Your cultural daughters open up mental **portals**, eventually sparking a cultural revolution converting you to a **tribal** culture. Historically, by the end of the game all the species died out except the descendants of Cro-Magnon (that's us!).

- a. **Turns.** Each game **turn** represents 40 generations (perhaps 800 years). Each turn has six *phases* (**A1**) during which each player performs his actions for the phase before going to the next.
- b. **Terminology.** Terms being defined are listed in **bold**, or *italicized* if defined elsewhere. **Capitalized terms are defined in the *Glossary of Tribesmen Roles* (player aid).**
- c. **The Golden Rule.** If the text on a card contradicts these rules, the card has preference. **If text on a play aid contradicts these rules, the rules have precedence.**
- d. **Combination Game with *Greenland*.** See (**K1**). *Greenland* is also in the *Dominata* series, and so uses many of the same rules, mechanisms, and components.
- e. **Differences with the game *Greenland*.** Besides introducing new concepts (vocal, sexuality, blizzards, predators, gathering, portals, neolexia, Wanderlust, precondition tools, and maturity), *Neanderthal* uses different *disk management* (**B3**), a new *Fire Starter* (**D4**), and novel costing for *promotion* (**E2**), *marriage* (**E3**), and *elder actions* (**I3**). Because there is no re-rolling, the turns should go faster. Raiders can attempt intermarriage only as solitary Suitors (**E3**), not as a party of Sabine Raiders, and cannot raid livestock.

## **A1. NEANDERTHAL SEQUENCE OF PLAY (six phases per turn)**

1. **EVENT & CULTURE AUCTION (Part D).** Reveal a daughter card to begin the turn. This indicates the *first player* (**A2**) and the turn's event icons (see player aid), applied top to bottom to all players. Then *auction* the daughter shown on the bottom (**D7**).
2. **HUNTER ASSIGNMENT (Part E).** All players assign their unassigned tribesmen to hunt biomes (**E1**), become Elders (**E2**), or perform *courtships* (**E3**).
3. **NEGOTIATIONS, ATTACKS, & GATHERING (Part F).**
  - a. **Bribes.** As long as one of the negotiators has a Chief, players can bribe others to peacefully withdraw Hunters from contested biomes, including marrying them to their daughters (**F1**).
  - b. **Attack Roll.** Players must use their Hunters to attack other Hunters on the same card (**F2**).
  - c. **Gathering species** add one Baby for each *gathering biome* (**F3**) they occupy.
4. **ROLL FOR HUNT (Part G).** All players make hunt rolls, rolling one dice for each of their assigned Hunters. If the number of hits rolled is at least equal to the number of "hit dice" icons, add new **Babies** (i.e. unassigned tribesmen for the next generation) and/or free dedicated disks of the color indicated into your vocabulary.
  - a. **The "1" icon** = each "1" rolled is a hit. The "\*" icon = each "1" or "2" rolled is a hit.
  - b. **Hunter Attrition.** The frostbite and animal-bite icons show which dice-rolls kill off Hunters, regardless if the hunt is successful or not (**G0**).
  - c. **Courting.** Successfully courting a ~~foreign~~ mature daughter places a Husband (**G1**).
  - d. **Inventions.**<sup>6</sup> Having certain I Cards (inventions) allows dice rolling a "3" to be counted as 1's (**G2**).

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<sup>6</sup> INVENTION indicates a tool or technology created because it was envisioned in the "mind's eye" before it was made, as opposed to accidental tinkering or learning. The "mind's eye" is possible only in a people fully equipped with a syntactic language and an internal monologue, as I argue in the essay on words at the end of the rules. I believe that very ancient tools,

- e. **Contest.** On a contested biome, the first to hunt successfully sends all others home empty-handed (**G3**).
  - f. **Predators.** After a successful big game hunt, move the Hunters to the closest predator in the row for a second hunt (**G4**).
  - g. **Trophies.** Biomes with trophies can be added to your tableau (**G5**), and aren't replaced, leaving a gap in the row. Biomes with inventions or domesticable animals can be taken into your hand (**G6**), but are replaced in the row.
  - h. **Survivors.** Surviving Hunters are returned to your *unassigned tribesmen* (**B0**).
- 5. DOMESTIC ANIMALS (Part H).** Each mature **D** Card in your tableau gives you the Babies and frees the disks specified.
- 6. SPECIES ACTIONS (Part I).** You may perform one action:
- a. **Portal Action** (vocal only) adds one portal disk from your vocabulary to your brain map (**I1**). This can flip your Placard to tribalism (**I1d**).
  - b. **Neolexia Action** (vocal only) frees one dedicated disk to your vocabulary (**I2**).
  - c. **Elder Action** (tribal only) adds one **D** or **I** Card (as specified) from your hand to your tableau (**I3**). To perform an Elder Action, you need an Elder of the proper rank (i.e. row on your Placard). You also must dedicate a vocabulary disk of the specified color by placing it on the **D** or **I** Card.

## A2. PLAYER ORDER - PHASES 1 & 2

The leftmost icon **at the top** of the turn's **event** card shows the color of the **first player**, and the color of the next one shows the second player. For the first two phases, the first player performs the phase first, then the second player, and finally the last player.

- a. **Council of War.** If this turn's card designates you as the first player and you have a rank 4 Elder (Warrior) at the start of the turn, you may designate other players as the first and second player for the entire turn.

## A3. NEGOTIATE/ATTACK ORDER - PHASE 3

Any Hunters remaining on a contested card after negotiations must *attack* (**F2**) Hunters of other players. The player with the most black vocabulary disks attacks first.<sup>7</sup> If tied for the most black disks, go in

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such as handaxes, are not inventions or technologies because they were developed before the advent of words as tools of cognition. Although handaxes require an extraordinary amount of intelligence and knapping skills to manufacture, the motivation to do so comes not from an envisioned product, but by natural selection and/or female preference. The first invention may have been the hafting of a stone point onto a wooden shaft. Evidence from a Syrian Neanderthal site suggests that the point was glued to the shaft using fire-softened bitumen, rather than lashed on. Other Neanderthal sites seem to have used pitch made from birch bark. The mere fact that variations in technique are possible suggests that Neanderthal had some verbal cognitive software installed very early, perhaps 300 kya. And yet the remarkable non-inventiveness thereafter argues that hafting was an accidental gradual development, perhaps the result of a long association of Neanderthal glue use for various purposes.

<sup>7</sup> ACHEULEAN STONE TOOL INDUSTRY are represented by black disks in the game. This includes the handaxe, a pear-shaped flint tool used by humans for a million years and inherited by all three species in the game. But nobody knows what it was for. It could have been used for all sorts of jobs: butchering animals, cutting plants, stripping bark, extracting marrow, or all of the above. Since they were sharp all around, perhaps they were a projectile for slings. But why the obsessive attention to symmetry and refined form? Why were so many needed for the small groups, thousands in some sites? Why does wear analysis indicate that most were unused? Why were some much too big or too small for any practical use? Why do some seem to have been abandoned and stuck into the ground point first? These facts argue that the handaxe form was driven not by technology, which requires both a verbal cognitive template and the ability to manipulate verbal-created images in one's mind. Rather, its form was more likely maintained by Darwinian "sexual selection", assuming lek behavior where females selected

*player order (A2).*

- a. **Attack First.** The totem woman allows you to attack first in any contested card. If tied, go in most black disk order.

#### **A4. HUNT ORDER - PHASE 4 Hunt or court biomes in this order:**

- (1). **Uncontested Rolls.** Each player rolls for each of his uncontested courtships and non-predator biomes, in an order of his choice. **When making rolls, *player order (A2)* is adhered to only if someone requests it.**
- (2). **Contested Rolls.** Roll for each contested courtship and non-predator biome, in an order specified by the first player.
- (3). **Predators.** Roll for all *predator biomes (G4)*, in an order specified by the first player.

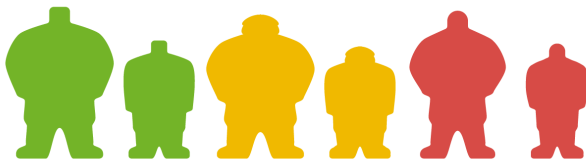
*Note: Some Hunters may have been transferred to the predator biome per G4. First Hunter rules apply if there are multiple Hunter groups on a predator.*

- a. **Least Hunter Order.** On a contested card, the player with the least number of Hunters there hunts first. If tied, go in *player order (A2)*.
- b. **Hunt First.** **The Totem Woman allows you to hunt first.** If tied, go in *least hunter order*.

*Note: The remaining phases (5 & 6) go in any order.*

## **B. COMPONENTS**

**54 Tribesmen** represent **Elders** if on a Placard, **Husbands** if on the husband box of a daughter, and **Hunters** if anywhere else. There are 18 in each of the player colors (Cro-Magnon = red, Neanderthal = yellow, Archaic = green). You must keep your **unassigned tribesmen** separate from the common **deadpile**.



**3 Large Tribesman.** Each player has a larger **tribesman**, used for his *Alpha Hunter (E5)*.

**15 Orange Disks** represent social words. Use these to raise daughters with social skills and to promote tribesmen into Husbands, Warriors, or Chiefs. Your vocabulary (disks of all 3 colors) help keep your tribe unified and not wandering into chaos.<sup>8</sup>

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the tool-maker with the most perfectly-made handaxe. If the handaxe was the product of female rather than technological choice, it would explain why the design was so static for so long, by far the longest used tool in human experience. Whatever its function, the cultural revolution abruptly ended the reign of the handaxe. Not a single handaxe has been uncovered in regions colonized after the revolution, for instance America.

<sup>8</sup> DISKS REPRESENT WORDS. Why? I argue that (1) words are the most important human invention ever, and (2) the primary function of words is not communication with others, but communication with oneself, as the basis for “consciousness”. Introspect on your own thoughts, a stream of words with grammar and syntax, running more or less continuously (even at

**15 White Disks** represent nature words (including the use of bone, antler, and ivory). Use these to raise daughters with nature skills, promote tribesmen into Shamans and Trappers, to invent bone tools, and domesticate animals.

**15 Black Disks** represent technical words (especially for making and using stone tools). Use these to raise daughters with technical skills, promote tribesmen into Fire Starters and Knappers, attack first, and to invent flint tools.

**60 Cards** (See the side of the box). There are 21 daughter cards, 18 North Europe biomes, 18 South Europe biomes, and 3 Sexuality Cards.

**3 Placards** (Each player starts with one, see the side of the box). You start on the “vocal” side, depicting the Brain Map. Disks placed on your Brain Map indicate *portals* between your three brain domains.<sup>9</sup> Tribesmen on the vocal side represent up to 4 kinds of Elders, each with the abilities shown. Flip to the other side if you convert to *tribalism*, allowing two more Elders.

**10 Six-sided dice (10d6)**. Use for attacks, hunt rolls, and Elder die-off.

**1 Achievement Sheet.**

**1 Arrowhead.** Use as a current player marker or alternately as a first player marker, especially during *council of war (A2)*.

## **B1. BIOME TYPE AND CLIMAX**

The **biome icon** in the upper right corner of a biome describes the biome type: either (warhead) big game hunting, (spear) small game trapping, or (club) courting/flint collecting/*etc.*

- a. **Climax.** The number next to the icon is the climax. The lower the number, the more likely it is to be replaced by *global warming or cooling (D1)*.

*Note (first edition errata): Unfortunately, card 26 (red deer) and card 35 (chamois) have a climax of 16. Therefore, use dice to decide which has the lower climax, should it be required.*

## **B2. TABLEAU AND HAND MANAGEMENT**

You will manage a faceup row of cards alongside your Placard called your **tableau**. Your starting tableau will contain your Placard and a sexuality card. During the game you will add daughters, trophies,

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night, with rather less context). Animals (and humans for most of their history) had no running stream, as they lacked the vocabulary. But at some point (which I postulate to be the event called “the cultural revolution), the first word was used both during speaking and as a unit of mental processing. The word came to be used as the medium by which the left “word building” half of the brain communicated with the right “executive” half of the brain, following the ideas of Julian Jaynes. See the essay at the end of the rules book.

<sup>9</sup> SPECIALIZED INTELLIGENCE occupied three ancient mental domains according to Leda Cosmides and John Tooby: **social** for ‘mind reading’ and interacting with other individuals, **natural history** for understanding the natural world, and **technical** for the manufacture, manipulation, and hurling of stone and wooden artifacts. Evidence for these modules stems from the inability of animals and early man to be able to use information obtained from processing in one domain in another. This changed when the processing units in all three domains came to be mapped to vocalizations that humans can make.



domestic animals and inventions.

- a. **Hand.** Biomes with the “hand” icon can be taken into your hand per **G6**. While in your hand they represent unrealized ideas, and so are not in play and their abilities and VP are not activated until played into your tableau as an *Elder Action* (**I3**). Daughter cards you purchase in auction go directly into your tableau (alongside your Placard).
- b. **Hand Size.** Your hand size is equal to the number of your mature Elders (**tribal side only**). (Before the advent of literacy, only Elders were able to pass information between generations.)
- c. **Hand Size Reckoning.** If you acquire a new hand card and your hand is full, you must choose one to discard. If your hand size drops (e.g. you lose an Elder), you must discard hand cards until your hand size is reached.
- d. **D or I Cards.** Biomes that can be taken into your hand are marked with a purple band and a “**D**” (domesticable animals), or a brown band and an “**I**” (inventions).

### **B3. DISK MANAGEMENT & MATURITY**

You are strictly limited to the 5 orange, 5 white, and 5 black disks you start with. You will never gain, trade, change color, or lose any disks. Your disks will always be either free (i.e. in your vocabulary) or **dedicated**.

- a. **Vocabulary.** This is the number of disks in your pool. Use your **vocabulary** for bidding in the culture auction, precondition tools for hunting, and establishing immature Elders, Husbands, and domestic animals. Finally, a large vocabulary promotes social cohesion by preventing chaos.
- b. **Portals.** These are disks in your brain map. Use your portals for neolexia and as preconditions for Elders of ranks 3, 4, and 5. Portal disks are not freed until you have a certain number, whereupon you **immediately convert** to tribalism (**I1d**).
- c. **Immature Elders and Husbands.** A disk dedicated to establish an Elder or Husband is placed under his meeple to indicate he is not yet **mature and his abilities are inactive**. This disk may be freed by *neolexia* (**I2**), *hunting* (**G3**), or *domestic animals* (**H1**).
- d. **Immature Daughters, D Cards, and I Cards.** Disks dedicated to bid on a daughter, to domesticate an animal, or create an invention are placed on the card to indicate it is not yet mature **and its abilities are inactive**. These disks may be freed by *neolexia* (**I2**), *hunting* (**G3**), or *domestic animals* (**H1**). **The card is mature once all the disks are removed.**
- e. **MPI Disks.** If you have harem-holding or promiscuous sexuality, place disks, called **MPI disks**, on your sexuality card where indicated. These disks are removed from your vocabulary and are not freed unless you change sexuality.<sup>10</sup>

### **B4. TOKEN MANAGEMENT**

You are limited to the 1 Alpha and 18 **tribesmen** of your color provided. **Treat your Alpha figure as an ordinary Hunter until you gain** one or more **mature** Elders of ranks 3, 4, or 5 (**E2**), which confers Alpha

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<sup>10</sup> MPI stands for Male Parental Investment, the time and energy the father is willing to invest so that his children will survive to breeding age. Most mammalian males provide no parental care, and their sperm is their sole contribution to their offspring and their temporary mate. This is represented by the 6 MPI disks for the promiscuous sexuality. But the big-headed human babies are born prematurely in comparison to other primates, and for many months are helpless. Human males hunters could achieve a considerable genetic payback by sharing the handy, dense packages of protein they brought back.

abilities.

- a. **Alpha-Hunter Swap.** During any phase, you may swap your Alpha with an unassigned tribesman, if your Alpha is in the deadpile or permanently assigned as an Elder or Husband.

## C. SETUP

1. **Events.** Separate the daughter cards, and randomly place 10 of them into a shuffled facedown stack. Set aside the remainder for possible use later.
2. **Draw Decks.** Separate the North Europe biomes (as stated on the card back), which go into a shuffled facedown deck. Do the same for the South Europe biomes, in a deck just below the North deck.<sup>11</sup>
3. **European Biomes.** Reveal the top six cards of the North Europe deck and spread them into a row to the right of the draw deck. Do the same for the South Europe deck. These are the North and South **rows**.
4. **Starting Placards.** Randomly assign each player to a Placard (red, yellow, or green). Place your Placard in front of you on its vocal side (showing the brain) to start your **tableau**; see the side of the box.
5. **Sexuality Cards.** Distribute each of the three double-sided cards with a “comet” icon in the upper right corner randomly to each player. Each player chooses a **sexuality** by placing this card either facedown or faceup into his tableau.<sup>12</sup>
6. **Starting Tribesmen.** Each player gets the 18 **tribesmen** and the large tribesman (Alpha) of his color. Place 6 tribesmen below your Placard; these are your **unassigned tribesmen**. Put another tribesman into the elder spot in the lower left corner (marked with a downward arrow); this is your **Fire Starter**. Put your Alpha and your remaining tribesmen together with the Alphas and tribesmen of the others into a communal **deadpile**. It’s best to use a small bowl to keep the common deadpile separate from the living tribesmen.
7. **Starting Disks.** Start each player with 5 disks of each color. Store these 15 disks next to your Placard. This is called your **vocabulary**.

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<sup>11</sup> EUROPE, the coldest and most ice-bound corner of the megacontinent, was first invaded 800 kya by *Homo erectus*. Subsequent invasions, likely across the Bosphorus and along the Danubian corridor, occurred by 500 kya (Archaic Man), by 150 kya (Neanderthal), and by 45 kya (Cro-Magnon). By the time of the Last Glacial Maximum (20 kya), the whole of Continental Europe (except Scandinavia and regions covered by ice), had been settled. The hybridization of humans and the harsh conditions of Europe seemed to have kindled the cultural revolution.

<sup>12</sup> MATING STRATEGIES differ enormously in three of humanity’s closest living relatives: chimps are promiscuous, gibbons are monogamous pair bonders, and gorillas are harem-holders. “*Judging from the social habits of man as he now exists, and from most savages being polygamists, the most probable view is that primeval man aboriginally lived in small communities, each with as many wives as he could support and obtain, whom he would have jealously guarded against all other men. Or he may have lived with several wives by himself, like the Gorilla....*” Charles Darwin, *The Descent of Man*, 1871.



- a. **Starting Portal.** From your vocabulary, place one disk of the color specified in the portal spot marked with a downward arrow on the brain map.
- b. **Fire Starter.** From your vocabulary, place one black disk under your Fire Starter. This indicates he starts immature.
- c. **MPI Disks.** From your vocabulary, place the number of disks indicated on your sexuality card (**B3**).

### C1. THE TWO PLAYER GAME

Pick two random cultures, and the cards of the third culture are not used.

- a. **First Player.** If a player color who is not in the game is assigned to go first, the color of second icon designates which player actually goes first.
- b. **Conversion to tribal** occurs with 6 instead of 5 portals.

## D. PHASE 1, EVENTS & CULTURE AUCTION (player order)

- a. **First Player.** Reveal the daughter card and determine the *first player* per **A2**.
- b. **Events.** Apply from top to bottom each of the card's *event icons* to all players (**D1 to D6**).
- c. **Culture Auction.** Vocal players *auction* the card as a daughter per **D7**.

### D1. GLOBAL COOLING AND WARMING (sun icon)<sup>13</sup>

The **global cooling icon** means to take the top card of the northern Europe deck and, without revealing it, use it as an **ice-sheet** (i.e. facedown) to replace the lowest *climax* (**B1**) card in the north row. The card which has been replaced shifts directly south, replacing the card already there, which is discarded from the game.

- a. **Ice-sheets.** Consider ice-sheets to be very high climax, so they are not affected by climate change other than “Glacial Melt” (next bullet). If the north is entirely ice during global cooling, shift one ice-sheet directly south (into a gap if any **to choose among**, or displacing the lowest climax southern card if no gaps) to make room for another northern ice-sheet.

*Example: Global cooling occurs. The existing three cards in the north row are climax 12, 23 and 27. The climax 12 card is displaced to the south and replaced with a new facedown card drawn from the north deck, representing the growth of a northern ice-sheet. The displaced card shifts south, and replaces the card immediately below.*

The **global warming icon** means to reveal the top card of the southern Europe deck and use it to replace the lowest *climax* (**B1**) card in the south row. Shift the replaced card directly north, either into a gap if there is one there, or displacing the card there which goes out of the game. However, if the card already

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<sup>13</sup> THE ICE AGE that has plagued the Earth for the last 2 million years continues today. The glacial periods of this Ice Age were interrupted occasionally by warmer (but still very cold) periods called interglacials. We live in one of those brief interglacials, and may consider it “warm” outside, but should not forget that the last time Earth had seen actual ice at the poles or on mountaintops was 250,000 kya, long before the dinosaurs. So today is abnormally cold. At the start of the game 45 kya, it was at least 5° C colder with temperatures dropping even further during the Würm glaciation. As more and more water was tied up in the spreading ice-sheets, Earth suffered desertification, droughts, and dropping sea levels. Humans were forced south as the ice advanced.

there is an ice-sheet, then instead flip it over to reveal its non-ice side, and discard the shifting card out of the game.

b. **Glacial Melt.** After the new card is placed, global warming melts any ice-sheets in southern Europe. Indicate this by flipping these cards faceup.

## D2. WÜRM GLACIAL (glacier icon)<sup>14</sup>

Take another daughter card at random from the unused deck, and without looking at it, place it on the bottom of the game's event deck. This adds one more turn to the game.

## D3. ELDER DIE-OFF (dice-skull icon)

Each player rolls a number of dice equal to the number of "dice-skull" icons, and kills off each Elder of the rank rolled, if he has any (A1.6). He consigns the dead Elder to the deadpile, and if it is immature, returns the disk to his vocabulary. If he has no Elder of the affected ranks, there is no effect.

## D4. CHAOS (comet icon)<sup>15</sup>

If the "comet" icon appears, all players remove at least half their **unassigned tribesmen**, i.e. all the tokens in your pool including your Alpha and foreign *Wanderlusters* (D6). You also lose exactly one Elder (of your choice, *mature* or *immature*) if you have any. Place the removed Elder into the deadpile.

a. **Chaos Immunity.** You are safe from chaos if the number of your unassigned tribesmen is less than or equal to your *vocabulary* (B3). If tribal, you are also safe from chaos if you have a mature Chief in the rank 1 spot. This anti-chaos protection is shown by the "slashed comet" icon.

b. **Fire Starter.** If you have a mature Fire Starter in the rank 6 spot, your chaos losses are rounded down instead of up, and you do not lose an Elder.

c. **Sexuality Decision.** If you suffer any losses during this chaos event, you may flip your sexuality card to its other side, releasing any *MPI disks* (B3) that were on it. If the new sexuality requires MPI disks, these must be added or the sexuality change fails.

*Note: If you change to promiscuous, you are no longer allowed to place Husbands, but Husbands already placed remain*

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<sup>14</sup> THE WORST ENVIRONMENTAL DISASTER IN HUMAN EXPERIENCE? What catastrophe rendered 20%-30% of the Earth's land area as lifeless as the moon? Answer: The last glacial maximum, especially the Würm Glacial in Europe from 70 to 11 kya. Except for brief Mesozoic episodes, life had not experienced ice for hundreds of millions of years, and even today remains extirpated from the interiors of Greenland and Antarctica. But if today's Ice Age lasts long enough, perhaps the ice-sheets will turn green with ice-adapted vegetation.

<sup>15</sup> CHAOS refers to the lack of group cohesion caused mainly by the selfish gene. It's a myth that individual animals act for the good of their species; they actually act for the furtherance of their genes. Violent struggles during courtship for access to females lead to the toppling of the alpha male (a theme explored in our game *Pax Porfiriana*). A toppling leads to mass infanticide, another source of chaos which is the cause of a third of gorilla deaths. The new dominant male kills off the infants that he "realizes" do not share his genes. Although most female mammals know when they are ovulating, human females do not. Concealed ovulation may have evolved in humans to keep daddy at home at all times, protecting the genes invested in "his" kids, when otherwise he would be tempted to wander off in search for ovulating females to impregnate when his own mate was not fertile.

*married. The same goes for Husbands placed if you are promiscuous and have the piper daughter. They remain even if you lose the piper daughter.*

***Example:** In a chaos event, Archaic has 3 unassigned tribesmen (including his Alpha), but has only 2 vocabulary. He is vocal, and has the Fire Starter, allowing him to round losses down and ignore the elder loss. He therefore loses one tribesman to chaos. If he did not have the Fire Starter, he would lose both his tribesmen, leaving only his Alpha. Because of his tribesman loss, he may flip his sexuality.*

#### **D5. BLIZZARD (blizzard icon)<sup>16</sup>**

The “blizzard” icon means that each player discards his choice of Dependents he cannot support. You need two unassigned tribesmen (including Alphas and foreign Wanderlusters) to support each Dependent.

- a. **Dependents.** Each Elder, unmarried daughter, **daughter married to an immature husband**, and domestic animal in your tableau is a **Dependent**. Unsupported Elders go to the deadpile, while unsupported daughters and domestic animals are discarded out of the game. Husbands (**mature or not**) are not Dependents, **and if they lose their wife become an unassigned tribesman after the blizzard.**
- b. **Immature Dependents.** Immature Elders, daughters, and domestic animals are also Dependents. If lost, this frees their disks which are returned to your *vocabulary* (**B3**).

***Example:** In a blizzard, you have 5 unassigned tribesmen, 2 unmarried daughters, 2 Elders, and 1 domestic animal. Your 5 tribesmen can only support 2 Dependents and you choose to lose the animal and both the Elders to preserve the daughters.*

#### **D6. WANDERLUST (eye-wing icon)**

A **Wanderluster** is a tribesman of one player’s color controlled by another player. If you lost the most tribesmen during the chaos event, take one tribesman of your color from the deadpile for each “eye-wing” icon on the event. If tied in the number of tribesmen lost, use *player order* (**A2**) to see whose tribesmen wander. You resurrect these tribesmen, called **Wanderlusters**, to another player’s *unassigned tribesmen*. In a three-player game, you choose which player or players they wander to. Once there, these Wanderlusters are in his service, yet retain your player color. He treats them exactly like his own tribesmen (**including during attacks**) with the following exceptions:

- a. **Chaperone.** Every Wanderluster assigned to a biome must have at least one non-wanderlust Hunter as a Chaperone. To avoid confusion, place the Chaperone on top of one of the Wanderluster(s).
- b. **Wanderlusters** cannot become Alphas, Elders, or Husbands.
- c. **Victory.** Each Wanderluster counts toward victory according to their color, not according to

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<sup>16</sup> HUNTER-GATHERER SURVIVAL is all about getting through the bad times, the blizzard icon represents a particularly harsh winter. If your energy supplies run low before spring comes, you must sacrifice elders, unmarried daughters, or farm animals.

in whose camp they reside.

**Example:** Neanderthal has only three unassigned tribesmen left, and two of them are red Wanderlusts. He suffers chaos (or some other tribesman loss), and must lose two tribesmen. He chooses both of the red tribesmen to die, sent to the common deadpile. (What is being simulated here is assimilation, not that all foreigners are literally the first to die).

### D7. CULTURE AUCTION (vocal only)<sup>17</sup>

After the card's events are resolved, all vocal players may bid for it. Tribal players may not bid (because their tribe's culture has been fixed by their verbal taboos and traditions).

**Exception:** Tribal players with harem-holding sexuality are treated as vocal during culture auctions, but their bid counts half (without rounding). If a card is not bid upon, discard it out of the game.

- a. **Bid Media.** You may only use disks in your vocabulary of the color(s) shown in the **top** of the card for bidding. All of these disks are of equal value.
- b. **Bid Procedure.** Any vocal player can initiate the bid by announcing a number of disks and any other vocal player can match this or increase it. When bidding, you do not need to specify the disk color. When nobody is willing to go higher, the high bidder wins and the losers get their bids returned.
- c. **Minimum Bid.** The minimum bid is one disk.
- d. **Ties.** If the bid is tied, resolve in *player order* (A2). The caring woman also breaks ties.
- e. **If you win the auction,** add the card as a **daughter card** to your tableau oriented 180°, so her side reads upright. Place the disks you bid on her card, which indicates that she is inactive due to *immaturity* (B3).

**Example 1:** The generous woman is up for bid, who requires black or orange bid media. Players Red and Yellow each bid one orange disk, and neither is willing to bid higher. Since Player Yellow is the first player, he wins the bid and places the daughter into his tableau with one orange disk on her. Player Red gets his bid returned to his vocabulary.

**Example 2:** A daughter with a bid media of orange is up for bid. But Archaic is the only vocal player with an orange disk, so he can buy her for one orange (the minimum bid). This disk is placed on the daughter card in his tableau. Suppose another player is tribal harem-holding and also can bid. If he is the first player, he can bid two orange disks (each count as half) and win the bid. If he is instead the last in player order, he can bid three disks and win the bid.

## E. PHASE 2, HUNTER ASSIGNMENT (player order)

In *player order* (A2), each player **assigns** his unassigned tribesmen by placing it on a card, either a biome (hunting), Placard (promotion), or a daughter card (**courting**). You may assign tribesmen in any order.

- a. **Assignment Limits.** When you assign tribesmen to hunt biomes you may place as many on a biome

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<sup>17</sup> MOTHERESE. According to Valérie Fridland, Professor of Linguistics at the University of Nevada, women are the primary caregiver and accordingly are the vanguard of linguistic changes which they pass on to children.

card as you wish. When you assign tribesmen as husbands or promote them to become elders you are limited to one tribesman in each elder slot or on each daughter card. You may add tribesmen on multiple cards. You may choose to leave some tribesmen unassigned at the end of Phase 2 (E).

## E1. HUNTING BIOMES

To hunt one of the biomes that are revealed, place Hunters directly on it.

- a. **Hunting Precondition Tools.** You may not place any Hunters on a card unless you have the one or two **precondition tools** indicated in the hunt results row of the biome card. For instance, to hunt the steppe bison, you need to have a black disk, representing technical jargon. This disk must be part of your *vocabulary* (B3), and is not expended by the hunt. If you hunt multiple cards with preconditions, you need enough disks for all of them.<sup>18</sup>

*Note: Placing Hunters on the card entitles you to make a hunt roll in Phase 4, even if you no longer have the precondition tools in your vocabulary by then.*

## E2. ELDERS AND PROMOTION TO ELDER

Promote an unassigned tribesman to Elder status placing its **figure** on one of the Elder ranks on the Placard. This is a *permanent assignment* (E4), and his listed benefits are effective as soon as he *matures* (B3). There are 6 Elder ranks: 1 = Chief (tribal only), 2 = Shaman (tribal only), 3 = Knapper, 4 = Warrior, 5 = Trapper, and 6 = Fire Starter.

- a. **Promotion Costs.** Unless you have free promotions, you must set a vocabulary disk under the **figure**, of a color the same as the color of the Elder rank icon (orange, white, or black). This disk indicates he is immature. Once mature (i.e. his disk is *freed* per B3), all his listed abilities are activated.
- b. **Limits.** You are limited to one Elder per rank, and Elders cannot change ranks.
- c. **Phase 1 (Event) Elder Benefits.** The Chief protects your tribe from chaos. The Warrior allows you to **specify the player order**, if you are the assigned first player. **During chaos (D4), the Fire Starter prevents elder loss and allows you to round losses down instead of up.**
- d. **Phase 2 (Hunter Assignment) Elder Benefits.** The Fire Starter gives you cost-free elder promotions.<sup>19</sup>
- e. **Phase 3 (Negotiations/Attacks/Gathering) Elder Benefits.** The Chief allows your Hunters **negotiations** (F1). The Warrior allows *War Party* formation (F2).
- f. **Phase 4 (Hunting) Elder Benefits.** The Fire Starter protects your Hunters from frostbite. The Knapper, Warrior, and Trapper give your *Alpha* special powers (E5).
- g. **Phase 6 (Elder Action) Elder Benefits.** The Chief lets you perform **your** elder action without cost.

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<sup>18</sup> PRECONDITION TOOLS in the game are not applied to predators. This is because assigning hunters to a predator in the game is interpreted as using torches to drive it away from its kill so you can steal its meat. Not for the faint of heart.

<sup>19</sup> FIRE was rarely and opportunistically used by humans since *H. erectus*. However, Neanderthals were the first to regularly exhibit fire and hearths in their campsites and show signs they had mastered starting fires, not just transporting live embers. This happened very late in their tenure, about 60 kya.

The Shaman, Knapper, or Trapper can perform an *elder action* (I3).

h. **General Elder Benefits.** All tribal Elders increase *hand size* (B2).

i. **Precondition Disks.** If Vocal, you may not promote an Elder of ranks 3, 4, or 5 unless you have a *portal* (I1) of each of the 3 colors in the specified domain. This is similar to *precondition tools* (E1), except the required disks are portals instead of vocabulary.

*Example: You have a black venus portal and two Shaman portals (white and orange). This gives you portals of all three colors in your social domain, satisfying the preconditions for a Warrior (rank 4). During Phase 2, you promote a Hunter into a Warrior by putting its figure on top of an orange disk indicated in the upper left corner of the Placard. The orange disk indicates the Elder is immature.*

### E3. COURTSHIP

Each player may assign an unassigned tribesman as a **Suitor**, to a maximum of one per daughter, placed somewhere on the daughter he is wooing. A Suitor of any sexuality can court any daughter (mature or immature, foreign or domestic, married or single). A Suitor may become a Husband in Phase 4.

*Important (Lolita Rule): Since courting always fails if the daughter is immature, you should not assign a Suitor to an immature daughter unless you think the daughter will mature by the time the courting roll is made.*

a. **Benefits.** If your Suitor becomes an immature Husband, he has a limited *attack* ability per F2. If he subsequently matures (i.e. his disk is *freed* per B3), he makes his wife into a non-dependent, defends her from suitors **as a War Party**, and is worth VP at the game's end. If you are pair bonding, a Husband (mature or immature) is required to unlock your daughter's benefits.<sup>20</sup>

### E4. PERMANENT ASSIGNMENT

Placing unassigned tribesmen on the *Placard* (E2) or the *husband box* on daughters (G1) is a **permanent assignment**. This means the tribesmen are not counted as unassigned tribesmen (e.g. during chaos) and are not returned to your unassigned tribesmen during Phase 4.

- a. **Sultan's Exception.** If harem-holding, during Phase 2 you can shift your Husbands in your tableau (including immature ones) among your unmarried mature daughters. This can be useful to challenge Suitors.
- b. **Almost Extinct Exception.** If you begin this phase with all tribesmen assigned as **Wanderlusters, Husbands, or Elders**, you may reassign one or two Elders or Husbands as unassigned tribesmen. If all your tribesmen are dead, you become a *Lazarus Species* (J1).

### E5. THE ALPHA

Your **Alpha** is treated as any other Hunter, unless it acquires **special powers** by use of *Elders* (E2). There are three special powers: big game, small game, or club. Your Alpha may have one, two, or all three of these powers.

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<sup>20</sup> MARRIAGE “represents prolonged contact between species. This may initially be limited to exchange of goods. At some point contact will intensify and exchange of technology ideas and behavior will occur. The pinnacle of interracial contact in this game is exchange of people and interracial marriage and inevitably mating... represented by both the player of the daughter and the Husband to use the special ability of the daughter. So courtship is just an abstract to represent interracial contact. But interracial contact does not come easy. The difference between cultures represented in the game is much bigger than what we see today in the world. They will not easily trust each other. Fighting will be inevitable. People who at some point manage to live with the other species will find themselves ousted when distrust takes over the advantages of trade...I think it is wonderful how a simple concept of marriage is used to represent something complicated as contact between species.” Kyrill Melai, 2015.



- a. **Creation.** You start with your Alpha in the deadpile. If you have an Elder of ranks 3, 4, or 5, you may create an Alpha with an *Alpha-Hunter swap* (B4).
- b. **Big Game.** If you have a Knapper, your Alpha on a “big game” biome may consider its hunt roll to be a “1”, without actually rolling for it.
- c. **Small Game.** If you have a Trapper, your Alpha on a “small game” biome may consider its hunt roll to be a “1”, without actually rolling for it.
- d. **Club.** If you have a Warrior, during Phase 3 attack rolls, your Hunters colocated with your Alpha form *War Parties* (F2). Furthermore, your Alpha on a “club” biome (including daughters) may consider its hunt roll to be a “1”, without actually rolling for it. Note that for the *Attack Roll* (F2), the Alpha must roll like any other Hunter.

*Important: You must decide to use a special power before making the hunt roll. If you choose not to use it, then he rolls a dice like every other Hunter.*

- e. **Victory Points.** If he has any special powers enabled, your Alpha is worth VP at the game’s end (J0). However, to earn the Alpha VP he must be an unassigned tribesman, not an Elder or Husband.

*Example: You have a black, white, and orange portal in your “nature domain” on your brain map, and have promoted a Trapper. As long as this Elder is mature and hasn’t died, he allows your Alpha to automatically roll a “1” in small game hunting.*

## F. PHASE 3: NEGOTIATIONS, ATTACKS, & GATHERING

### F1. NEGOTIATIONS (disallowed between vocals)

If you either have tribesmen on the same card as an opponent, or have tribesmen on an opponent’s tableau card, you may open **negotiations** with him. One or both negotiating parties must be tribal with a rank 1 Chief. A tribal player can make a **proposal** for one party to leave a card peacefully: demand, exchange, or offer hand cards or mature tableau cards (including **unmarried daughters**), offer or demand unmarried mature daughters for marriage (allowing a Hunter to be promoted into a mature Husband in a foreign tableau with an *auto-success courtship roll* (G1)), or make non-binding agreements about plays on future turns.

- a. **Leaving.** Your Hunters may leave during this phase only if all other players with tribesmen present allow you to leave. If your Hunter leaves, either return him to your unassigned tribesmen (so he can’t do anything this turn), or else marry him to a foreign bride (G1), if agreed to by the player holding the unmarried daughter.

*Note: In a trade, hand cards must be exchanged with hand cards and tableau cards with tableau cards.*

- b. **Divorce.** Your Husbands may leave daughters during negotiations, joining your unassigned tribesmen.
- c. **Oook Rule.** During negotiations, a vocal player should say nothing other than “yes” (ook!) or “no” (ook ook).

## F2. ATTACK ROLLS <sup>21</sup>

Your Hunters must **attack** other Hunters on the same card by rolling a number of dice equal to the number of your tribesmen present. Each player is allowed one round of **attack rolls** per card. Except for *War Parties* (see below), each “1” will kill a **Hunter** of the victim’s choice.

- a. **Most Flint Order.** Attacks are performed in *most black disks order (A3)*. That is, the player with the most black vocabulary disks rolls first and applies damage, then the next attacker, etc. You may distribute your kills among multiple defenders.
- b. **War Party.** If you have a *Warrior (E2)*, the group of Hunters that includes your Alpha is called a **War Party**. If you have an invention marked as a **weapon**, all your Hunters form War Parties. All the Hunters in a War Party, including the Alpha, achieve a hit if they roll a “1” or “2”.
- c. **Jealous Husbands.** *A Husband can attack and be attacked by Suitors of other players.* In combat between a Husband and a Suitor (**E3**), a mature Husband is considered a War Party while an immature Husband can attack but not as a War Party.<sup>22</sup>

**Example:** *Neanderthal is promiscuous and has a Warrior. He sends his Alpha to court a married Cro-Magnon daughter. The Husband has more black disks and attacks first, but fails to roll a “1” or “2”. The Alpha is a War Party, and he rolls a “2” and succeeds in killing the Husband. Since the Alpha is on a club biome, in the next phase he is automatically successful in his “hunt” roll. **Because** he is promiscuous, he leaves a Baby per **G1**.*

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<sup>21</sup> WAR. Despite the development of throwing-spears and game ambush tactics, there is no archeological evidence for organized warfare until 14 kya. Nomadic hunter-gatherers have no permanent homes, animals, or stored food to raid, confining conflict arenas to women, contested hunting grounds or big kills. Because weapon use is in the natural history cognitive domain, and fellow humans are in the social domain, perhaps weapons use against humans of the same species was not conceivable until the advent of cognitive fluidity. On the other hand, forensic evidence of the Neanderthal skeleton Shanidar 3 indicates that he was struck by an atlatl-propelled spear, and died some weeks later. This is evidence of interspecies conflict or warfare, since only *H. sapiens* used spear throwers.

<sup>22</sup> SEXUAL DIMORPHISM means a large size difference between males and females, and is a sign of harem-holding mating strategies. Our distant ancestors the Australopithecines had sexual dimorphism and likely had a sexist society where promiscuity was strongly chastised. But *H. erectus* and *H. heidelbergensis* have little sexual dimorphism, and were likely far more libertine. Such societies would be driven by “human sperm competition”, with genetic victory going to the males producing and delivering the most sperm. This is perhaps when people inherited their relatively large male genitals. One way to avoid the “sperm competition” is “safari honeymooning”, where a male would whisk his estrous partner off to the woods to be alone. This elopement, aberrant in a promiscuous society, could have led to the first marriage-like pair bonding. The darker side is that this increases male jealousy and violence.

### F3. GATHERING<sup>23</sup>

If you are a **gathering culture** (i.e. you are either promiscuous or have wives/daughters with the “gathering” ability), you collect 1 Baby (see glossary) for each **gathering biome** you occupy with one or more Hunters. These biomes are marked with the **basket icon**.

*Example: After combat, you have Hunters remaining on the tyrant sea bear (a “gathering biome”). Because you are promiscuous (so are spending more time collecting nuts than in child care), you gain one Baby in gathering. This Baby is obtained even if the sea bear later kills off all your Hunters.*

## G. PHASE 4, ROLL FOR HUNT (least hunter order)

Tribesmen (large or small) on a biome represent **Hunters**. When it is your turn to hunt (A4), make a **hunt roll** by rolling a number of dice equal to the number of Hunters you control on the card. If your roll shows a number of hits greater than or equal to the number of **hit dice** shown (“1” or “\*”), then it is successfully hunted (see G3 for results). If the hit dice is the “1” icon, each “1” is one **hit**. If it’s the “\*” icon, each “1” or “2” is one **hit**. After hunting, return all of your surviving Hunters to your **unassigned tribesman pool**.

- a. **Biome Resolution Order.** For which cards are hunted first, see A4.
- b. **Mandatory Hunt.** On your turn to hunt, all your assigned Hunters must make a hunt roll (exception, see G7). If an *Alpha* has his powers activated (E5), you may consider his roll to be a “1” without actually rolling for him.
- c. **Modified Roll.** The hunt roll may be modified (G2).
- d. **Ferocity Attrition.** Hunting and courting is dangerous. If the biome shows a **bloody dice**, any Hunter rolling that result has been killed (eaten by a prey animal confused about the hunter-prey relationship).
- e. **Frostbite Attrition.** Hunting is dangerous. If the biome depicts a **frostbite dice**, any Hunter rolling that result has been killed by the elements. If you have a *Fire Starter* (D4), all your Hunters are safe from frostbite losses.

## G1. COURTSHIP ROLLS<sup>24</sup>

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<sup>23</sup> MENOPAUSE is the natural programmed cessation of the female menstrual cycle, known only in humans and pilot whales. It likely evolved in humans (and possibly Neanderthals) sometime in the hundreds of thousands of years between the development of huge brains and the cultural revolution. It is a puzzle why the “selfish gene” would ever select for a process that prematurely shuts down the possibility of spreading itself. This game follows the “Grandmother hypothesis”, that menopause promotes the survival of a woman’s grandchildren. This would be especially true in promiscuous societies, where only mothers and grandmothers care for children. Studies by the anthropologist Kristen Hawkes on the Hazda hunter-gatherers of Tanzania shows that postmenopausal grandmothers devoted the most time to gathering (7 hours a day, compared to 4.5 hours for young mothers and 3 hours for young brides). Further, the experienced grandmothers brought home more kilograms of forage per hour than women in their prime. Indeed, as crazy as it sounds, in this game most of the extra hunters doing the foraging in a promiscuous society are actually grandmothers. Without the natural birth control of menopause, a woman would be pregnant or lactating her entire adult life, and would be at high risk from death from childbirth (a legacy of bearing babies with huge brains).

<sup>24</sup> EXOGAMY is the practice of leaving one’s clan to marry elsewhere, perhaps even to another subspecies. In general, human societies are female-exogamous, i.e. it is the females who leave home to marry, keeping both the gene pool and the idea pool diverse and healthy. In this, humans are similar to the other social apes (chimps and gorillas), but dissimilar to most monkeys which are male-exogamous. Genetic analysis proves that Sapiens-Neanderthal interbreeding had occurred by 55 kya, when

Each player with a surviving **Suitor** on a daughter card may use him to make a **courtship roll**. Each player can make only one courtship roll per daughter card.

- a. **Lolita Auto-Fail.** If the daughter is immature, the courtship roll cannot **succeed**.
- b. **Courtship Roll Procedure.** Roll 1d6. The roll is **successful** if a “1” or “2” is rolled. If a “6” is rolled, the Suitor is killed (as indicated by the bloody dice).
- c. **Auto-Success Courtship.** Unless the daughter is a Lolita, a Warrior Alpha always succeeds and a Suitor courting an **uncontested and unmarried** daughter in his own tableau always succeeds without rolling. If the courtship is contested (next bullet), a Suitor in his own tableau must compete for her hand like everyone else, with no “home court” advantage.
- d. **Multiple Suitors.** If there are multiple Suitors, each rolls for success in **most vocabulary order**, counting only the vocabulary colors shown on the bid media in the **top** of the daughter card. (This represents a verbal wooing.) If tied, the daughter’s father decides between them. The **first** successful courtship roll must install a Husband if it is possible to do so (next bullet), and sends all other Suitors home unrequited.

***Example:** The singing woman has just matured in the Neanderthal’s tableau, and all three players assign a Suitor to court her. The singing woman’s bid media is orange. Assuming they all survive the attack phase, the Cro-Magnon has the most orange disks and rolls first. He fails to roll a “1” or “2”, and Neanderthal has the next most orange disks. His courtship roll automatically succeeds, because he has a daughter in his tableau (the Singing Woman herself) who has the “poetry” ability to auto-succeed courtship rolls. Neanderthal however, is promiscuous, so even though his roll succeeds, he cannot place a Husband. Because the courtship is in his own tableau, there is no rape baby and the only effect of his successful courtship is to **send** the suitor of Archaic Man home unrequited. If instead Neanderthal was **pair bonding**, he would not have the auto-success courtship, because Singing Woman’s abilities are deactivated if she is unmarried. If he rolls a “1” or “2”, he must install an immature Husband, assuming he has an orange immaturity disk.*

- e. **Successful Courtship.** Only one Husband (mature or immature) is allowed per daughter. A successful Suitor returns the former Husband (if any) to the unassigned tribesmen of whichever player owns the tableau, and places the Suitor in the **husband box** as the new Husband. This is a *permanent assignment* (**E4**). If you cannot place the Husband, either because you lack a required orange disk for an immature Husband or because the Suitor is promiscuous (next 2 bullets), the Suitor returns to his unassigned pile and the husband box is left **unchanged**.
- f. **Husband Maturity.** **Your new Husband starts mature if in a foreign tableau, and immature, with an orange disk under his token, if he starts in your tableau. Regardless of maturity, the husband gains the daughter’s abilities and *portal actions* (**I2**), with her “father” sharing these benefits.**
- g. **Promiscuous Courting.**<sup>25</sup> If your successful Suitor in a foreign tableau is promiscuous, he cannot

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Neanderthal genes constituted as much as 1–4% of the Cro-Magnon genome. Ötzi the iceman, Europe’s oldest preserved mummy at 5.3 kya, was found to possess an even higher percentage of Neanderthal ancestry. Even more telling than genes is the fact that the cultural revolution occurred in both Cro-Magnon and Neanderthal populations.

<sup>25</sup> RAPE. This four-letter word, used in this game’s prototype, proved far too emotional a term to be the name of a game mechanic. By my use of euphemisms, I am regrettably perpetrating the taboos associated with rape, which cause it to be the most underreported violent crime. I apologize to its victims (one of whom I know personally) who have to suffer not only the crime, but the social stigma associated with it. Rape has Darwinian significance in primatology, where it is delicately called “coerced copulations”. It is estimated that half the orangutan babies are conceived from matings between young males and unwilling females who are part of a flanged male’s harem. This percentage of rape babies means the genes for aggressive male rapists are being selected for. This drives the orang society to be ever more solitary, which is harmful because like human

become a Husband and instead you add a Wanderluster of your color from the deadpile to the unassigned tribesmen of whichever player owns the tableau, representing your genetic legacy. This does not impact her marital status. Then your Suitor returns home.

h. **Alpha Husband.** If your Alpha becomes a Husband, see **B4**.

*Example (fog of love): An Archaic daughter married to a Neanderthal is being courted by Archaic and Cro-Magnon. All three players unsuccessfully roll for combat in Phase 3. Then, in vocabulary order the two suitors" (Archaic and Cro-Magnon) make a courtship roll in Phase 4. Archaic goes first, and rolls a "2" which defeats the other suitors. The Neanderthal ex-husband is added as a wanderluster to the Archaic tribesmen, and the Cro-Magnon is sent home. If instead the Cro-Magnon succeeded, and Cro-Magnon was promiscuous, then the Archaic Husband remains and all the suitors go home. A red Wanderluster is added to the Archaic tribesmen.*

## G2. HUNT MODIFICATIONS DUE TO INVENTIONS

If you have an **I** Card in your tableau with a Phase 4 dice modifier for the *biome type* (**B1**) being hunted, then dice showing "3" become "1" instead.

*Example: You have played and matured the "cordage snare" in your tableau. This has a phase 4 dice modifier with the "javelin-point" icon, indicating that all 3's rolled in small game hunts become 1's instead.*

## G3. RESULTS OF A SUCCESSFUL HUNT

If your hunt roll is successful, add the indicated number of **Babies** (taken from the deadpile, including your Alpha if he is dead) to your unassigned tribesmen. You must add these tribesmen if you have any available (**B3**). You also may free the number and color disks specified per **B3**. A successful hunt (i.e. generates Babies or trophies) returns your Hunters to your unassigned tribesman pool, unless there are predators (**G4**).

*Note: Unless you claim it as a trophy (G5) or take it into your hand (G6), the hunted card remains in the row.*

- a. **Limits.** You may gain the benefits of a hunted card only once per turn, even if you roll multiple successes. For instance, if you roll "1" "1" "1" when hunting rabbits you get one Baby, not three.
- b. **Competitive Hunt.** If a card is contested, see **A4** for the hunt sequence. The first player to succeed in the hunt roll gains the benefits, and all the other players go home unsuccessful (i.e. winner-take-all).
- c. **Attaining Authority.** If the disks freed by a successful hunt are used to mature an Elder, the powers of that Elder can be applied to subsequent hunts and subsequent phases, but not retroactively to this hunt. Hunting can also free disks and apply immediately the benefits of daughters and inventions.

*Example: Three Cro-Magnon and two Archaics are hunting wolves. The Archaics, with fewer Hunters, go first and are successful with one hit. The Cro-Magnon automatically go home in disgrace (with no attrition). They cannot attempt to domesticate the wolves, for instance.*

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infants the orang young are altricial. In chimpanzees, a promiscuous species, pair bonding is the "crime" and rape the "norm". Chimps will mob females who resist promiscuous matings or show favoritism for one male over another.

## G4. PREDATOR ATTACK

If your hunt roll succeeds in a big game hunt, you attract **predators**, i.e. cards with a red icon in the upper right corner. To find out which predator attacks, look at all the cards in the same row to see which one is the closest to the biome being hunted. Do not consider a predator on the other side of an ice-sheet in the row, i.e. predators can hop “gaps” but not ice. If two are equally close, both attack, starting with the lower climax.

a. **Procedure.** Move the surviving Hunters onto the card of the attacking predator. Once all big game hunts are resolved in this row, your hunters will make a second hunt attempt against the predator..

This hunt is resolved the same way as the first, and so may cause additional casualties or if successful may give the Hunters more resources or Babies.

b. **Predator Piracy.** If your Hunters do not get at least one hit on the second hunt roll against an attacking predator and the predator is not already eliminated, then the predator steals the big game you successfully hunted, so that you lose all the Babies, disks, trophies, and domestic animals you gained in the hunt (returning the card to its slot on the map).

*Note: Some predators may be taken as trophies (G5), while others may be domesticated (G6).*

*Example: In South Europe, you have 7 Hunters on the horse, and 1 Hunter (actually a Gatherer) on the scimitar cat. Your opponent has 19 Hunters on the elephant. Both big game hunts succeed, which puts all your Hunters and all his Hunters on the scimitar cat, joining the one already there. Your 8 Hunters hunt first. If you roll at least one “1”, the cat does not steal your horse. If you roll two “1”s, you successfully hunt the cat, and your opponent must go home without rolling for the cat, and are therefore not at risk for losing their elephant. Regardless of the success of the hunt or the piracy, if you roll quadruples you take the cat card as a trophy.*

## G5. TAKING TROPHY CARDS INTO YOUR TABLEAU<sup>26</sup>

The **antler icon** indicates a card that can be added to your tableau as a **trophy**. If it has two pips within the antler, it counts as two trophies. If it has 2, 3, or 4 blank dice on it, your hunt roll must include doubles, triples or quadruples to optionally add it to your tableau. Place it in your tableau rotated so the antlers are at the top.

a. **To claim a trophy**, neither surviving Hunters nor a successful hunt are necessary. For instance, if the trophy indicates doubles, a double six is an unsuccessful hunt yet claims the card as a trophy.

b. **Extinct.** The removed card has been over-hunted and is not replaced in the row (G7). Unless filled by shifting biomes in climate change, this gap remains the whole game, so that there is one less biome for the rest of the game.

*Remember: The Alpha is assumed to have rolled a “1”, which can cause “snake eyes”, “triple eyes”, or “quadruple eyes” to have been rolled. Also weapons can cause 3’s to be 1’s.*

*Example: Five fallow deer-hunters roll a “2” and three 3’s. This is a hunting failure because the deer requires 2 hits, but nevertheless takes the card as a trophy because of the triples. If they have an atlant*

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<sup>26</sup> THE OVERKILL HYPOTHESIS, as championed by Dr. Paul Martin, proposes that trophy-taking hunters caused the Late Pleistocene mass extinctions in the Americas and perhaps in Europe and Australia as well.



*allowing 3's to be converted into 1's, then the hunt is a success as well as a trophy.*

## **G6. TAKING D OR I CARDS INTO YOUR HAND (tribal only)<sup>27</sup>**

If you have at least one **mature tribal** Elder, the **hand icon** indicates a biome that can be taken into your hand. If it has 2, 3, or 4 blank dice shown in the blue field, your hunt roll must include doubles, triples or quadruples respectively to take it into your hand.

- a. **Doubles, Triples, Etc.** If you roll the doubles, triples, etc., you may take the card into your hand even if your hunt roll was unsuccessful.
- b. **Full Hand.** Cards can be taken into your hand even if your hand is full. But then you must immediately discard down to your *hand size* (**B2**).
- c. **Annihilation.** If a hunt (including predator attack) leaves no surviving Hunters, you cannot take any cards into your hand.

***Example:** A Trapper Alpha and two Hunters are hunting honey bees. Both Hunters roll 1's, and, since this is a small game hunt, the Alpha automatically rolls a "1". The hunt is a success, and furthermore the triples allow them to take the bees into their hand. They may later use an Elder Action (**I3**) to domesticate it. The honey bee card is replaced per the biodiversity rule (**G7**).*

## **G7. THE BIODIVERSITY RULE<sup>28</sup>**

If a card is taken as a *trophy* (**G5**), it is not replaced so the row now has one less card with a gap. If a card is taken into your *hand* (**G6**), replace it in the same position with the top card drawn from the draw deck of that row, so that the number of cards in the row is unchanged. If this introduces a predator, it is inactive until next turn.

- a. **Opportunistic Hunt.** If a card is taken into your hand but the hunt was unsuccessful, Hunters of other tribes that were on this card may attempt to hunt the replacement card if they have the proper *precondition tools* (**E1**).

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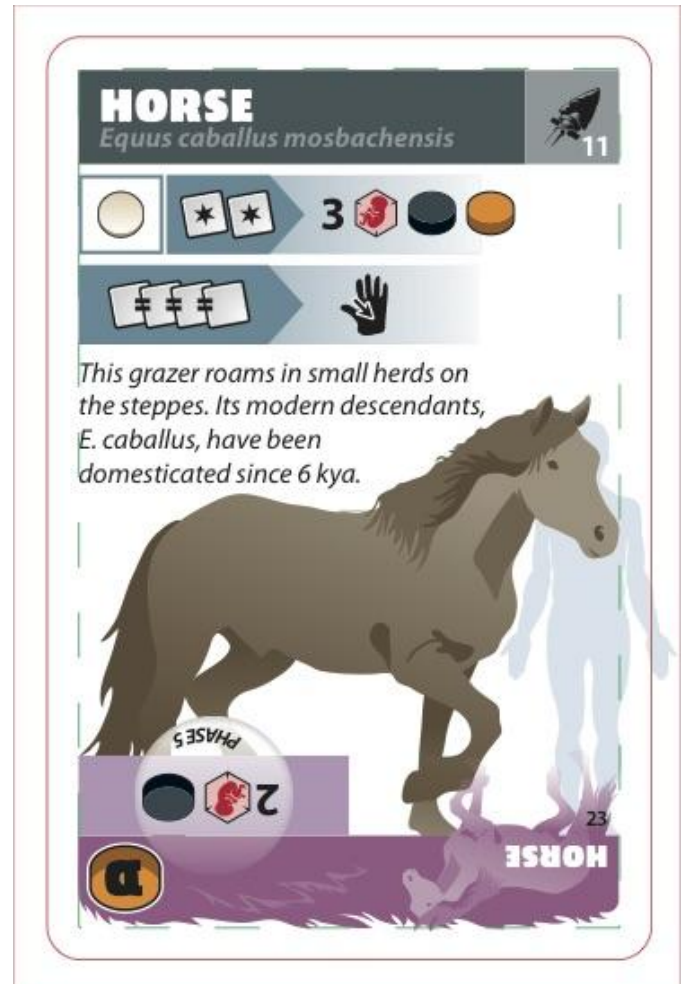
<sup>27</sup> NEANDERTHAL, an awesome *übermensch*, appeared a quarter of a million years ago in Pleistocene Europe. One of the biggest, strongest, highest stamina, and smartest creatures who ever lived. With a brain notably larger than our own, he had mastered a knapping technique so difficult that less than a dozen persons alive today can duplicate it. His multi-component thrusting spear, the most advanced in the world, could bring down a rhinoceros. He could tame fire, build shelters, and survive in the harshest corner of the supercontinent. Together with his Asian brethren the Denisovans, he should be able to invade the whole world including ancestral Africa. In a few tens of thousands of years, he should be inventing the microchip and flying 747's. But it didn't happen. Hundreds of thousands of years pass, and his behavior and tools have not visibly changed. True, such conservatism, set for the glacial pace of natural selection, is the norm for Earth's millions of species. But what is that huge brain for, if not for art, culture, or innovation? And when Cro-Magnon finally invaded, 45,000 years ago, he too had spent the last 100,000 years with a big brain and a stone age toolset but no art, culture, or improvements. The two superpowers were behaviorally equivalent, with all the culture and inventiveness of a stone. But somehow, their momentous meeting produced everything that we now regard as human.

<sup>28</sup> ALLEGED NEANDERTHAL RELIGIOUS RITUALS have proven hard to verify. For instance, the supposed sacrifice or worship of the now extinct cave bear based upon thousands of cave bear remains may represent the accumulation of beasts which died during hibernation, and arrangements of bones claimed to be artificial may in fact be natural. Nevertheless, both species frequented caves, and one bear vertebrae found with an embedded stone tip indicates the giant bears were occasionally hunted or fought. This game assumes that hunters who bring back big game trophies are rewarded by female choice to have their genes immortalized in subsequent generations.

## G8. HUNT EXAMPLE

Cro-Magnon (tribal) tries to hunt the horse biome in southern Europe. This big game animal requires two 1's or 2's to be successful. He is unopposed.

- a. **Phase 2 (Hunter Assignment).** By dedicating 1 black disk, he promotes a tribesmen to the 3rd rank (Knapper). Then he places his remaining 4 unassigned tribesmen, plus his Alpha, onto the horse card as shown.
- b. **Phase 4 (Hunter Roll).** Let's assume that Cro-Magnon first makes a successful hunt somewhere allowing him to liberate the black disk under his Knapper, making it mature. This is necessary to enable the Alpha powers for his Alpha Hunter. He rolls 4d6 for his five horse-hunters: "3", "4", "5", "6". Since only his Alpha succeeds and he needs 2 successes, the hunt fails.
- c. **Weapon.**<sup>29</sup> If he has atlatl spear-throwing technology, the "3" acts as a "1", resulting in hunt success. He gains 3 Babies and an orange and a black disk. Since he did not roll quadruples, he doesn't take the horse into his hand.
- d. **Predators.** Since the hunt was successful, the closest predator, the gray wolves, attack. The wolves are a "club" biome, and the Alpha is no longer an automatic success since there is no rank 5 Elder. All five Hunters roll "5", "5", "6", "6", "6". Two Hunters are killed off by wolves, and the rest die from frostbite. Because everyone dies, Cro-Magnon loses the Babies and disks gained from the horse hunt, and furthermore cannot take the wolves into his hand for domestication.
- e. **Fire Starter.** If Cro-Magnon had a mature rank 6 Elder (Fire Starter), all three Hunters that rolled the "6" are saved from frostbite. Since no hits were scored, the wolves still steal the horse carcass, so no Babies or disks are gained. However, the triples rolled with surviving Hunters means that the wolf card is taken into his hand for possible domestication later.



<sup>29</sup> WEAPONS. Humans are one of the few creatures able to kill at range, and the hand-eye coordination required may have been the reason for the evolution of our large brains. The first evidence of projectile weapons are the miraculously preserved set of throwing javelins found in Schöningen, Germany. Dated to 300 kya, they were balanced for throwing with sharpened wooden points. Evidence indicates that *Homo heidelbergensis* used them to hunt horses. During the cultural revolution, the first atlatls (spear-throwers) were developed by *H. sapiens*. In contrast, Neanderthal seems to have exclusively used thrusting spears. This was at great personal risk, given that analysis of Neanderthal bones of northwestern Europe has shown their principle diet was mammoth and rhinoceros meat, and not the mid-sized prey that dominate the Neanderthal cave sites. Presumably the bones from large prey were not dragged back to camp, giving a false impression of their primary hunting targets.

## H. PHASE 5, DOMESTIC ANIMALS (any order)

### H1. ANIMAL HUSBANDRY (tribal only)

If you have a mature **D** Card (**B2**) in your tableau, collect the Babies and free the disks indicated.

## I. PHASE 6, PORTAL, NEOLEXIA, & ELDER ACTIONS (any order)

In this phase, choose one action, either **Portal**, **Neolexia**, or **Elder**. Once you convert to tribalism, you can no longer perform either Portal or Neolexia actions!

### I1. PORTAL ACTION (vocals only)

Each daughter card depicts one or two **portals**, i.e. disks representing metaphoric words that bridge two brain domains. If vocal, for your action you may perform a **portal action** using a **mature** daughter either in your tableau or with whom you are married. This action allows you to take one disk of a specified color from your *vocabulary* and add it to a specified *portal spot* on your brain map. This portal disk simulates how metaphoric vocabulary can broach adjacent brain domains.<sup>30</sup>

- a. **Domains and Domain Colors.** Each brain map has three brain **domains**, for technical (black), nature (white), and social (orange) knowledge.<sup>31</sup>
- b. **Portal Spots.** The three **portal spots** are the **venus**, **Shaman**, and **bison** spots.<sup>32</sup> Each portal spot can hold two portals, one of each of the two colors shown. For instance, the venus portal can hold at most one orange and one black disk.<sup>33</sup> **Each portal is between two domains, for instance the Shaman portal**

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<sup>30</sup> THE TECHNICAL, SOCIAL, AND NATURAL HISTORY DOMAINS are depicted on the placards as being in the neocortex, limbic, and rhombencephalon respectively. These locations are suggestive rather than factual. The rhombencephalon is the most ancient part of the brain, shared by vertebrates and insects alike. The limbic system governs emotions, behavior, and long term memory. The neocortex is greatly expanded in humans, and contains the Broca's and Wernicke's language centers.

<sup>31</sup> THE BRAIN MAPS, following the ideas of Steven Mithen, hypothesize that the Pleistocene hunter-gatherer brains were compartmentalized into three domains: **technical**, **nature**, and **social** knowledge. The barriers between these domains prevented, for instance, an early man from carving bone tools. Why not? Because stones and stone tools were processed in his technical domain, as artifacts to be knapped, while bones and antlers were processed in his nature domain, as clues for game animal behavior. These processes were inflexible, like a Swiss army knife with specialized blades or computer programming. Portals were finally opened when words were used in multiple domains, such as the word "bone" being used in a technical setting (evidenced by the first bone artifacts). Other crossovers: "people" as objects to be manipulated (the first deceptions), "animals" as people (anthropomorphisms and totemism), "objects" as people (venus statuettes, grave goods). The fluidity of words triggered the cultural revolution. The culture cards denoting swear words, jokes, poetry, and other strange quirks of language are included because of my theory that the lingual features that are the least explicable are the most likely to be primal in cognitive fluidity.

<sup>32</sup> CAVE PAINTINGS, the earliest symbolic art, seem to have spread quickly around the world. The subjects, eerily similar from Spain to Indonesia, are almost always animals rendered with astonishing skill. People are seldom depicted, why not? Handprint stencils are a common signature, why? The locations are uninhabited portions of caves, visited only to make the paintings in torchlit darkness, why? And most remarkable of all, the art shows signs of being retouched over a period of a thousand years or more. I theorize that the paintings lubricated the recreation of images from the artist's verbal memory, while inculcating the concepts. The exercise of specific pathways in the neural network is known to reinforce them, akin to fuzzy logic, which could have made the brain conducive to this vital step in the road to consciousness. A process repeated today every time an infant masters language.

<sup>33</sup> VENUS FIGURINES, portable hand-held statues with exaggerated female features, but with reduced or absent faces, arms, and

is always between the social and nature domains.

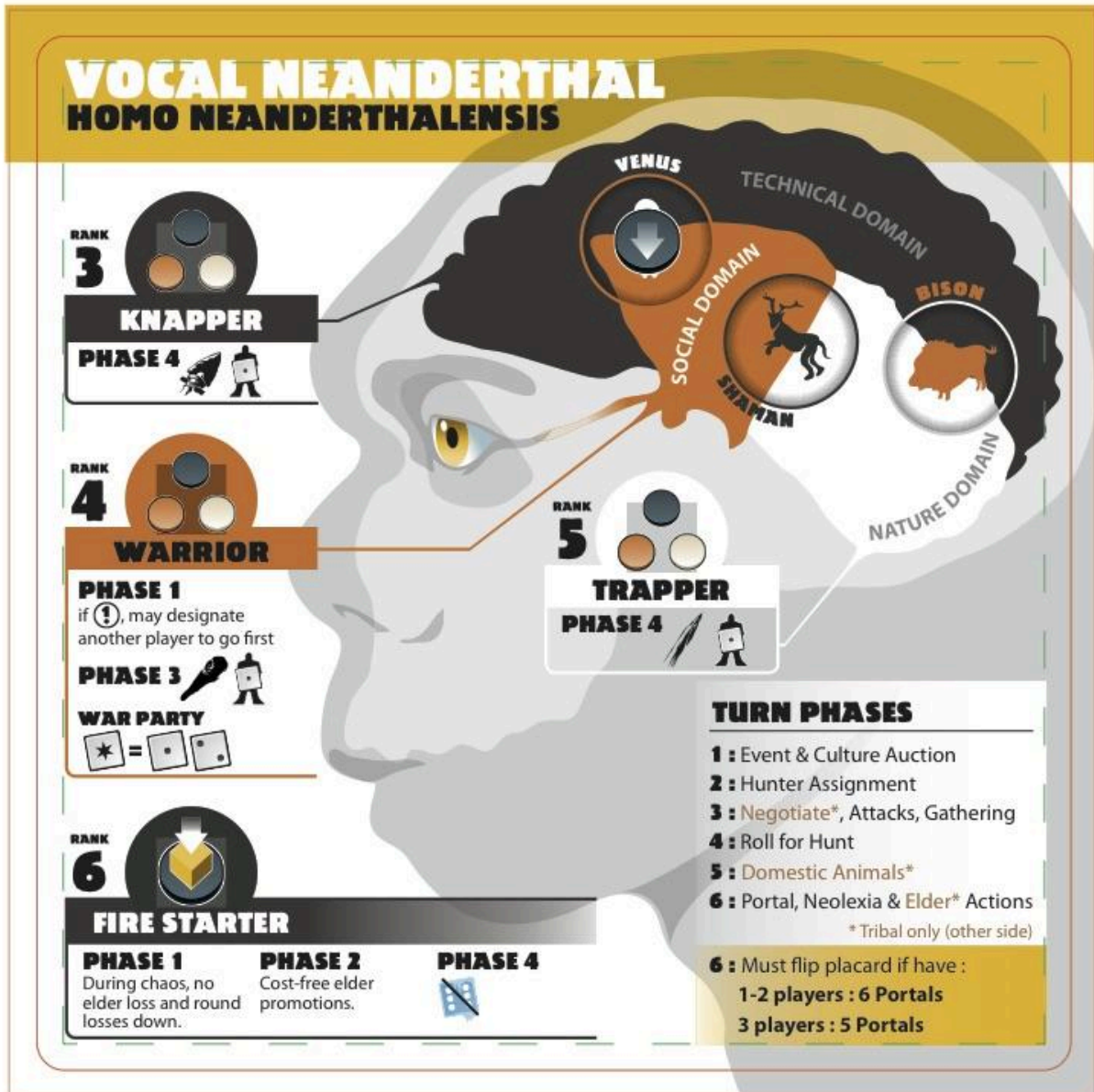
c. **Portal Use.** Portals can be used for *precondition disks* (**E2**). They can't be used for bidding, precondition tools, or victory. They can be freed only by converting to tribalism.

d. **Conversion.**<sup>34</sup> A brain map with 5 portal disks instantly becomes lingually fluid (all 6 portals in the solitaire or 2-player game). Flip it to its **tribal** side, and add the portal disks to your **vocabulary**. Transfer Elders (as well as any disks under them) to the equivalent rank on the tribal side.

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feet, have been found in Europe. The oldest, carved from mammoth ivory, date back to the cultural revolution. They strangely have no analogs in cave paintings. Julian Jaynes speculates that they acted as portable mnemonic devices, reminders to a nonconscious people who could not voluntarily retrieve admonitory lessons given to them by their mothers. Shadows of this ancient utility are presumably why we still place figurines on our desks, churches, and keychains, for reasons we often can't ourselves explain.

<sup>34</sup> THE CULTURAL REVOLUTION, also called the Chatelperronian culture, was perhaps created by a hybrid human, as suggested by one of the box illustrations. But remarkably, once started, it spread to both the Neanderthal and Cro-Magnon peoples between 45-40 kya, as evidenced by sophisticated stonework, multicomponent tools, prism core blade factories, adornment necklaces of intentionally pierced fox and marmot teeth, and rings and pendants made of ivory. Each greatly expanded their existing ancient technology in their own fashion, without copying the other. This argues that what was being spread was language, and symbolic art such as early paintings and sculptures were the first school supplies.



*Example: You have both venus portals (orange and black), and one portal (white) on your Shaman. Because your social domain contains disks of all three colors, you may promote a Warrior.*

## I2. NEOLEXIA ACTION (vocals only)<sup>35</sup>

Neolexia (i.e. creating new concepts) is an action that frees one disk matching the color of a portal you

<sup>35</sup> NEOLEXIA is the creation of new words, both for communicating with and thinking with. External communications were likely pioneered by males in the dominance games or in organized hunts. This is represented in the game by scavenging, flint mine, and social disks, among others. But perhaps the first use of words for both external and internal communications (i.e. units of thought) was pioneered by females, who taught this skill to their babies.



have in your brain. It can be from a daughter, Husband, Elder, ~~or D or I Card~~. The freed disk goes to your vocabulary.

- a. **Exogamy Bonus.** If you are married to a foreign daughter, you may perform neolexia using one of the colors already installed on a previous turn in the brain map of the player who owns the daughter. If he is tribal, you have access to all three colors.<sup>36</sup>

*Example: Cro-Magnon has both Shaman portals (white & orange), and an immature daughter with a white and orange disk on her. On phase 6, he performs neolexia and frees the orange disk. During the next phase 6, he does the same with the white disk, which matures the daughter.*

### 13. ELDER ACTIONS (tribal only)

Each player may perform one of the following **Elder Actions** if he has an Elder in the specified rank and dedicates the vocabulary disk indicated (unless you are allowed cost-free elder actions). An Elder is not expended by performing an action.

- a. **Shaman Domestication (rank 2):** Play one **D** card in your hand into your tableau, rotated 180° so the purple text reads upright. Place a white disk on the domestic animal to indicate it is immature.<sup>37</sup>
- b. **Knapper Tool-Making (rank 3):** Play one **I** card in your hand into your tableau, rotated 180°. Place a black disk on the invention to indicate it is immature.<sup>38</sup>
- c. **Trapper Tool-Making (rank 5):** Play one **I** card in your hand into your tableau, rotated 180°. Place a white disk on the invention to indicate it is immature.<sup>39</sup>

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<sup>36</sup> THE FIRST ART. Archeologists and anthropologists seem remarkably incurious as to why mankind developed art. No other animal reads literature, contemplates paintings, carves statues, sets music to composition, recites poetry. The same can be said of deliberate burials with grave goods, which like art seems to have negative survival value. Why bury tools requiring man-months to construct? These are usually explained by referring to a belief in religion and the afterlife, two concepts that require a huge repertoire of abstract concepts unlikely to have been articulated until tens of millennia later. Rather than abstracts like death and time, the appearance of grave goods likely signaled the first remembrance of individuals with names, when physical mnemonics of the words of an elder was a life or death matter. Hand-held venus figurines could also have served a mnemonic purpose. This was the first time that memories were stored verbally and recalled as hallucinated “voices”, the prototype of the universal stream of verbal thoughts each of us is immersed in as soon as we learn language. Verbal thoughts could be reconstructed as images, the first imaginations and fantasies, such as imagining a figurine is your mother speaking to you. This led to dramatic changes in attention to things and persons, indicated in the archeological record by the appearance of the celebrated cave paintings and bone flutes. Thus both art and culture are explained as artifacts of consciousness.

<sup>37</sup> ANIMAL DOMESTICATIONS did not occur until the neolithic, with the dog as the first to be tamed by 15 kya according to genetic and archeological evidence. If so, their inclusion in the game is rather anachronistic. However, 36 kya dogs, with DNA more closely allied with modern domestics than wolves, have been discovered in Belgium and Russia. Conceivably, they might have taken advantage of carcasses left on site by early hunters, assisted in the capture of prey, or provided defense from large competing predators at kills. Domestication of megafauna was accomplished soon after the weather turned warm in the Holocene, but in the frigid Pleistocene it was hampered by the lack of hay technology to keep the animals alive over the winter. Had the weather turned warmer earlier, it's possible domestications could have occurred as depicted in this game. However, domestic animals would have been utilized for their meat and hides. The “secondary product revolution”, using domestic animals for work or milk, was not until the late neolithic.

<sup>38</sup> LEVALLOIS is the distinctive stone knapping technique of this period, commonly associated with the Neanderthal Mousterian industries. This is incredibly difficult to master. It was replaced by the vastly simpler and more flexible prism core knapping technique during the cultural revolution.

<sup>39</sup> NEOLITHIC refers to stone age tools and techniques that were not developed until the Holocene (when *H. sapiens* was the



*Tip: It is not necessary to convert to tribalism to win. Even to make the attempt invests a lot of vocabulary, and it's possible you will never get access to the right portals for conversion. The advantages of tribalism is that it enables VP in domestics and inventions, and also solidifies your culture against chaos.*

## J. GAME END & VICTORY

The game ends at the end of the last turn of the event deck, or when Europe is completely ice-filled (no hunttable cards remaining). Count up Victory Points (VP) as listed on your Sexuality Card, which may be modified by certain daughters. All tribesmen of your color count toward your victory, even if in the camp of another player. The Alpha counts for Alpha victory only if empowered per **E5**. Daughters, Elders, Husbands, domestic animals, and inventions count VP only if *mature*.<sup>40</sup> *If tied for victory, you each share the victory.*

- a. **“Selfish Gene” Promiscuous Victory.** Elders, Husbands, daughters, and vocabulary count as 1 VP each. Each unassigned tribesman counts as 2 VP. Trophies and inventions count as 3 VP. The Alpha and domestic animals count as 4 VP.
- b. **“Family Values” Pair Bonding Victory.** Each unassigned tribesman, daughter (married or unmarried), and vocabulary counts as 1 VP. Each Elder or trophy counts as 2 VP. The Alpha, Husbands, and inventions count as 3 VP. Domestic animals count as 4 VP.
- c. **“Big Man” Harem Victory.** Each unassigned tribesman, Elder, Husband, and vocabulary counts as 1 VP. Each daughter counts as 2 VP. The Alpha and inventions count as 3 VP. Trophies and domestic animals count as 4 VP.

*Example: At the end of the game, you are Pair Bonding. In your camp you have 9 unassigned tribesmen, an empowered Alpha, 1 trophy, 2 daughters, and 12 vocabulary disks for 28 VP. You have 1 Wanderluster and 1 Husband in another player's camp, for 4 VP. Your total score is 32 VP.*

### J1. LAZARUS SPECIES<sup>41</sup>

If all your tribesmen are dead, you can no longer hunt or give accept Wanderluster, but can still bid in auctions and count victory.

*Note: Before becoming Lazarus you may reassign permanently assigned tribesmen, see E4.*

## K. LEGACY VARIANTS

### K1. COMBINATION NEANDERTHAL-GREENLAND GAME

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only human left standing). Such technology, including polished tools, pottery, farming, towns, and walls, are not included in the game because at 12 kya they are much too modern.

<sup>40</sup> FOUR COMMANDMENTS OF MATING SYSTEM THEORY: “First, if females do better by choosing monogamous and faithful males, monogamy will result - unless, second, men can coerce them. Third, if females do no worse by choosing already-mated males, polygamy (harem-holding) will result - unless fourth already-mated females can prevent their males from mating again, in which case monogamy will result. The surprising conclusion of game theory is therefore that males, despite their active role in seduction, may be largely passive spectators at their marital fate.” Matt Ridley, 2003.

<sup>41</sup> NEANDERTHAL EXTINCTION. No Neanderthal fossil younger than 40 kya has been unearthed. After living for 250,000 years with little innovation or culture, in their final 5000 years of cohabitation with *Homo sapiens*, they made remarkable advances in tool-use, art, and language fluidity. And yet it was not enough. They did not entirely go extinct, as the entire Neanderthal genome has been sequenced and it has been found all non-African humans today contain a few percent of their genes.

You can start a *Greenland* game using the tribesmen leftover at the end of a *Neanderthal* game. If so, the VPs you attained in *Neanderthal* are recorded and added to your final *Greenland* score to determine the overall winner. Setup is per **Part C (Greenland)**, except:

- a. **Starting Tribesmen And Disks.** You are limited to the tribesmen (including unassigned Elders of any maturity, and Husbands of any maturity) and all disks (not bound in immaturity) you had at the end of *Neanderthal*. You may allocate your tribesmen either as unassigned, or (Tunit only) Colonists. This may give you more or fewer than indicated in **Part C**.
- b. **Elders.** Exchange your *Neanderthal* Placard for the *Greenland* one of the same color. Elders transfer to the equivalent rank.
- c. **Domestic Animals.** Exchange each of your *Neanderthal* domestic animals with a *Greenland* domestic animal chosen at random from the **D** biomes. The Norse choose from the unused Norse animals. The Sea Sami use the Sea Sami animal.
- d. **Inventions.** Exchange each of your *Neanderthal* inventions with a *Greenland* invention chosen at random from the **I** biomes.
- e. **Daughters.** Exchange each two of your *Neanderthal* daughters with a *Greenland* daughter chosen at random from your side.
- f. **Vocal.** If you ended the *Neanderthal* game as a vocal, you are not allowed to start the *Greenland* game with any Elders, and are not allowed promotion for the first turn.
- g. **Ice.** For each ice-sheet in North or South Europe, start one of the biomes in North or South Greenland respectively on its cold side.

## **K2. SOLITAIRE OR COOPERATIVE VARIANT**

~~In this variant, either one player plays as all three species, or three players play the three cultures as usual. In either case, the players are equally victorious only if at least two species survive with one or more domestic animals (mature or immature) at the end of the game.~~

- ~~Setup and Game Length.~~ Setup is per **Part C**.
- ~~Negotiation.~~ Each turn during Phase 3, one free disk or mature **I** card from one species can be swapped with one free disk or mature **I** card from another species, as long as at least one species is tribal. No swapping of population, daughter cards, or **D** Cards. The Negotiation Rule (**F1**) remain in effect.
- ~~Mandatory Trophies.~~ In this variant, taking a trophy per **G5** is no longer optional if you roll doubles, etc.

## **K2. INTRODUCTORY SINGLE SPECIES VARIANT, Courtesy The Spurge.**

In this *solitaire* scenario your chosen species attempts to survive an isolationist “inbreeding” period and thereafter return to interbreeding. During this period, one other species will have limited access to your species, during periods of chaos, and possibly to your species’ daughters. Setup and gameplay are the same for a 3-player game with these exceptions:

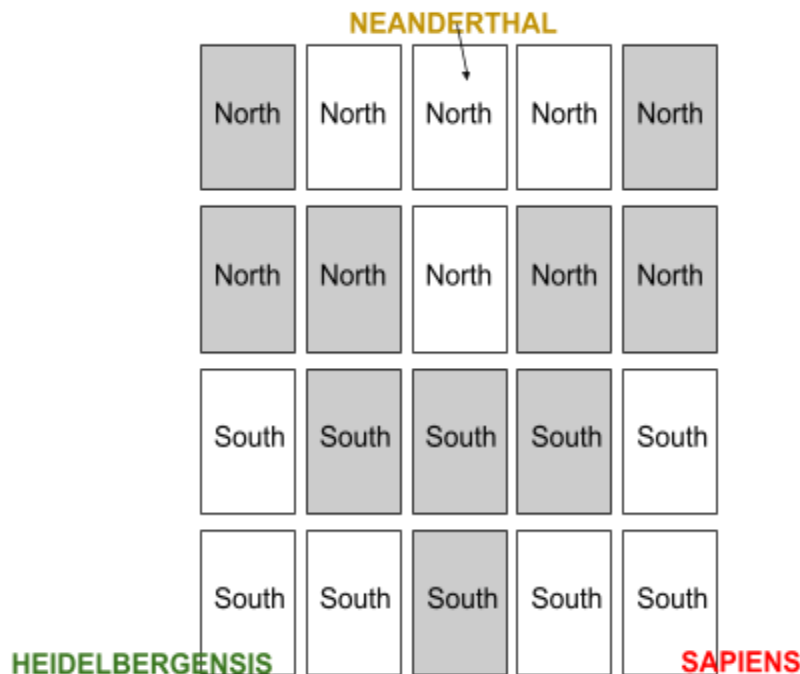
- a. **Tribesmen Setup.** 8 unassigned tribesmen, 1 immature Fire Starter (Rank 6 on placard).
- b. **Event Setup.** 8 Event/daughter cards. After these run out (i.e., in 8 turns plus any Würm Glacials **D2**), you may choose to add from 1 to 3 random event cards.
- c. **Placard Flip to Tribal.** 5 Vocabulary disks required for tribal (placard flip); this replaces the last bullet of **I1**.
- d. **5 Daughter Limit.** During Phase 1, you automatically gain the daughter of the event, up to a limit of

- 5 daughters. Once at the limit, you can replace one unmarried daughter for the new one on the event.
- e. **Chaos/Wanderlust.** If your species does not suffer unassigned tribesman loss (do not count elder loss), then add another player's (foreign) color tribesman into your unassigned pool (1 or 2 as designated).
  - f. **Foreign Suitors.** During Phase 2 the other species assigns a Suitor to each of your mature daughters not married to a foreigner. During Phase 3, your species is the first player, and the foreign Suitor attacks as a War Party.
  - g. **Victory.** If at the end of the last turn, you have (1) attained 50+ points, (2) gotten to tribal, (3) obtained 4+ trophies, and (4) all your daughters are married.

*Note: This game, greatly simplified and much shorter than the multi-player game, is intended to teach you the game mechanisms. Playing time: 0.5 to 1.5 hours.*

## L. SOLITAIRE VARIANT "Alien Intervention" (by Jon Manker)

This variant speculates that the cultural revolution of 40-50 thousand years ago may have been ignited by alien artifacts instead of the sapiens-neanderthalensis interchange. These artifacts are scattered across Europe, and your goal is to interact with as many as possible. This signals alien monitors that humans are ready for uplift.<sup>42</sup>



### L1. SETUP

Setup is per (C) except in C0.3 form a matrix of 4 rows with 5 **face down** cards in each row. These represent undiscovered biomes. Use north row cards for the top 2 rows and south row cards for the bottom 2 rows.

<sup>42</sup> TOTEMS is my preferred interpretation of the "artifacts" in this game. These are carved records that, like tombstones, serve as admonitory reminders of deceased leaders. In an era before memories were stored in lingual format, such totems could have served a mnemonic role. *Phil Eklund, 2018.*

- a. **Home Biome.** Choose a species to play. Your starting position, called your **home biome**, is shown above. Your home biome and the cards *adjacent* to your home biome are revealed. These represent neighborhoods you are familiar with.

*Note: In Variants L and M, adjacent means sharing a border, so diagonal cards are not adjacent.*

- b. **Unassigned Tribesmen.** In (C0.6) place your unassigned tribesmen on your *home biome* to start.
- c. **Difficulty.** Choose how many alien artifacts you need to activate in order to succeed: from 2 for an easy game, to 5 for a very hard game.

*Important: Treat facedown cards as undiscovered; they are not an ice cap.*

## L2. SEQUENCE OF PLAY

- a. **Events (L3) & Culture Auction (L4).**
- b. **Hunter Movement, Assignment, Discovery (L5).**
- c. **Roll For Hunt (L6).**
- d. **Domestic Animals, per standard game (H).**
- e. **Portal, Neolexia, & Elder Actions, per standard game (I).**

## L3. EVENTS

This is per (D) except the biomes effects are expanded to account for the presence of Hunters, artifacts, and unexplored biomes. In general, Hunters follow a moving biome, while artifacts remain rooted to a matrix position.

- a. **Ice Caps.** When placing an ice cap during global cooling, rotate it 90 degrees (landscape orientation) to distinguish it from an undiscovered card.
- b. **Biome movement.** An undiscovered biome is treated in events just as a discovered one. Because in these variants there are several rows, a card shifting downward can push a cascade of cards downward. Similar with upward.

*Example: During global warming, a discovered card moves north into an undiscovered card. Per D1, the undiscovered card is replaced with the discovered one. Had the card moved into a discovered card it would have pushed it upwards and this card in turn would have followed the movement rules. Had the card moved into an ice cap, the moving card would be discarded and the ice cap would have melted, rotated back 90 degrees, and become an undiscovered biome.*

- c. **Determining Climax.** Consult setup diagram (L1) to see which cards are in the north row, and which are in the south. Consider only the climax of revealed cards, and ignore the event if no cards are revealed. If you run out of one of the card types (north/south) draw from the other deck instead.
- d. **Tribesmen on Shifting Cards.** If a biome is shifted north or south, tribesmen follow the shifted card. If a biome is replaced, tribesmen inhabit the new card. **Unrevealed biomes are revealed at the end of movement (L5b). Do not check for this or reveal any cards during the event phase due to shifting, wait until the end of movement. (This means that shifting cards can not open up new biomes for hunt during the same turn)**
- e. **Tribesmen on Removed Biomes.** Move the tribesmen to any biome that is *adjacent* (L1a) and revealed.
- f. **Artifacts on Shifting Cards.** Unlike tribesmen, artifacts (L6a) are locked to the grid and never move as cards shift. If artifacts are frozen in ice, they become inaccessible until the biome thaws

- again.
- g. **Chaos.** All Hunters on the map count as unassigned tribesmen for the purpose of determining chaos.
- h. **Wanderlust.** This kills one Hunter.

#### L4. CULTURE AUCTION

To get a daughter you have to pay disks equal to the amount of daughters you already have +1.

The following daughters have a modified abilities:

- a. **Fashion Woman.** Do not lose a Hunter during *wanderlust* (L3h).
- b. **Totem Woman.** After making a *hunt roll* (G), you may reroll one dice.
- c. **Caring Woman.** Pay 1 disk less for auctioned daughters.
- d. **Singing Woman.** You can use any color disk when paying for a daughter.

#### L5. HUNTER MOVEMENT & DISCOVERY

First move Hunters on the map, then reveal each inverted biome *adjacent* (L1a) to your Hunters.

- a. Each Hunter has 4 movement options
  - i. **Remain** as is.
  - ii. **Move** to an *adjacent* revealed biome,
  - iii. **Migrate** to a biome where you have Hunters (including those who have just moved),
  - iv. **Assignment** as a Husband or Elder.
- b. When all movement is done, reveal unrevealed biomes that are adjacent (L1a) to any biomes with hunter on.

#### L6. ROLL FOR HUNT

Make a mandatory *hunt roll* (G) for each biome where you have Hunters.

- a. **Alien Artifact Discovery.** The first time you hunt each biome, place a disk on the biome. If the hunt is successful and at least one dice face shows a “6”, then you additionally discover an artifact! Indicate this artifact by placing an orange disk. For any other result, place a black disk on the card to indicate the site is busted and will never have an alien artifact on it. The orange or black disks to indicate alien artifact presence or non presence are taken from the general supply, not from your vocabulary.
- b. **Alien Artifact Activation & End of Game.** If you, during the same turn, successfully hunt 2 biomes which had orange disks on them at the start of the current turn, the game ends at the end of that turn. You have activated a signal to the aliens who will travel to Earth and induce uplift. But this encounter is a different story.
- c. **Predators** attack after successful big game hunts if they are on any revealed card that is *adjacent* (L1a). ~~In the co-op game (M), note that predator hunt rolls cannot assimilate a second husband.~~
- d. **Trophies.** If a biome is taken as a trophy, relocate any Hunters to a biome that is *adjacent* (L1a) and revealed. However, an artifact on the card remains in the gap, and is inaccessible until the gap is filled.
- e. **Nomads.**<sup>43</sup> All assignments are *permanent* (E4). Therefore do not return Hunters to unassigned

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<sup>43</sup> DIVISION OF LABOR. The Pleistocene hunter-gatherers were quite nomadic, but nevertheless used specific nodes in the landscape as home bases for the sharing of food. These home bases allowed for a sexual division of labor, so ubiquitous among modern hunter-gatherers. However, according to Stiner and Kuhn, the Neanderthal sites were exceptional in exhibiting no

tribesmen after a hunt, and place all Babies on the biome where they are born.

### L7. VICTORY

Win if you trigger the artifacts per **L6b** before the game ends per **(J)**. You can score per **(J)** to see how well you succeeded.

## M. 3-PLAYER CO-OP VARIANT “THE BRINK” (by Jon Manker)

Genomic data collected and analyzed by the ADNABIOARC project indicates a genetic bottleneck close to extinction in Europe before 14,500 years ago.<sup>44</sup> Instead of tribes with 500 members, the tribes were down to 20-30 individuals, with limited genetic diversity between tribes. In this variant, the players each play a small nomadic tribe during this demographic bottleneck. Their goal is not only survival, but to maintain a healthy genetic and cultural interchange of cooperation.

- a. **Scale.** Each hunter represents one family unit, and each turn is 3 years. Total game is 1 generation.
- b. **Setup.** Per **L1**.

### M1. SEQUENCE OF PLAY

- a. **Events (L3) & Culture Auction (M2).**
- b. **Hunter Movement & Discovery (M3).**
- c. **Roll For Hunt (L6c,d,e).** Hunt rolls are mandatory where there are hunters.
- d. **Domestic Animals,** per standard game **(H)**.
- e. **Portal, Neolexia, & Elder Actions,** per standard game **(I)**.

### M2. AUCTION

The players decide together who will buy the daughter. The recipient must pay disks equal to the amount of daughters he has already plus one. The disks paid are restricted to colors of the *bid media* **(D7)**.

- a. **Abilities.** Some daughters have new abilities, see **L4**.

### M3. HUNTER MOVEMENT & DISCOVERY

This phase is performed per **L5** with the following exceptions:

- a. **Co-Hunting.** In this cooperative game there is no fighting between players. Furthermore, you can choose to pool Hunters assigned to the same biome for a combined *hunt roll* **(G)**. The gains from a hunt (Babies, disks, I/D cards) as well as the losses can be distributed among participating players in any fashion.
- b. **Assimilating Husbands.** For each combined hunt roll a surviving Hunter from one of the participating players becomes optionally **assimilated** with a Husband (either mature or not) from another of the participating players. You are allowed to do this even as promiscuous. Indicate

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signs of a division of labor based upon gender or age! There were no pounders or grinders, no bones of small mammals and birds, and no food storage. Presumably men, women, and children all had equal tasks in hunting and gathering, and all made their own tools.

<sup>44</sup> A GENETIC BOTTLENECK is associated with the abrupt warming ending the last glacial maximum (see diagram p. 29 in *Bios: Megafauna 2*). Only *Homo sapiens* was around at this time, in two genetic clades called M and N. The M clade went extinct in Europe, while the N clade barely survived. The Younger Dryas ended in a heat wave so sudden, sea levels rose 20 meters in 500 years from glacial melt.



assimilation by placing the Hunter with the Husband as a permanent assignment on the daughter card. The two tokens are thereafter treated as a single Husband. **Predator hunt rolls (G4) cannot assimilate a second husband.**

#### M4. VICTORY

By the *end of the game (J)*, each player must have achieved the following:

- a. **Tribal.** Have become tribal with at least 1 Elder and 1 Alpha.
- b. **Assimilation.** Have at least 2 mature Husbands, one *assimilated (M3b)* with **each** other player.

## N. NEANDERTHAL SCENARIO MODULE (by Jon Manker)

These rules allow you construct your own adventures, including asymmetrical situations that benefit or disadvantage specific cultures. This can be used as a handicap system if you have large differences in knowledge between players.

### N1. THE HOMINIDS

This scenario simulates an earlier period starting at around 250 kya. Each turn is 20000 years. The climate swings are more accurately simulated.

Setup (biomes)	Normal setup but: <ul style="list-style-type: none"> <li>★ Archaic starts with no open brain portals but 12 <b>tribesmen</b></li> <li>★ Cro Magnon starts with a mature firestarter and 1 more portal disc of his choice in the brain, but only 4 tribesmen.</li> </ul>
Setup (Events)	Sort the event cards into 3 piles: one for global warming events, one for global cooling events and one for the other events. Shuffle them all facedown and draw random cards to build an event pile from bottom up with: <ul style="list-style-type: none"> <li>★ 1 global warming card</li> <li>★ 3 global cooling cards</li> <li>★ 2 global warming cards</li> <li>★ 3 global cooling cards</li> <li>★ 1 global warming card</li> </ul>
Special Rules	<ul style="list-style-type: none"> <li>★ <b>D</b> and <b>I</b> cards need 1 more dice in order to be taken to your hand.</li> <li>★ To go tribal you need 7 disks in your brain. <b>The 7th disc may be placed on any portal.</b></li> <li>★ <b>If a Würm is drawn, take a card from the other event pile.</b></li> </ul>
Win conditions	Normal win conditions with a 5 VP bonus if you go tribal.

### N2. GIANT WÜRME

A longer game encompassing an average of 25000 years of history. It starts a bit earlier, in the harsher conditions around 55000 kya. It ends around 30000 kya.

Setup (biome)	Set the game up normally, except place the 4 middle cards of the north row with the ice cap side up. Players start with only 4 unassigned tribesmen and no Elders.
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Setup (event)	Shuffle all 21 daughter cards into the event pile.
Special Rules	<ul style="list-style-type: none"> <li>★ All 5 <i>Würm</i> events (<b>D2</b>) will appear, so after the 21 daughters have been revealed, shuffle all discarded daughter cards again and draw 5 of them to form a new event deck. If any of these 5 have a Würm, take cards from the unused ones as normal.</li> <li>★ After the shuffle (previous bullet) you have entered more modern times. From here on <b>D</b> and <b>I</b> cards require 1 less dice to take domestication and invention cards into to your hand. (This is in addition to the paintress ability if you have access to that).</li> </ul>
Win conditions	As normal except domesticated animals are worth 5 VP each regardless of your sexuality.

### N3. MENTAL STRATEGY FOR YOUR FIRST TURNS

You start with one portal in your brain, and the color of this portal is crucial because it enables *neolexia* (**I2**), the only way to mature your daughters, Elders, and Alphas. Immature units are largely useless.

- a. **First Daughter.** You will need daughters to gain more portals. Bid on daughters that give you as many colors of portals as possible (**I1**). But if you bid on any daughter with any disk color other than the color of the portal in your brain, you can't mature her with *neolexia* and must use big game hunting (next bullet). If this means an opponent nabs a useful daughter, try to court her as soon as she matures (**E3**).
- b. **Big Game Hunting.** Successful hunting of large animals allows you to mature black and/or white disks (**G3**). But this is chancy unless you have many hunters and can handle the predators, so in the early game don't rely on this.
- c. **Fire-Starter.** An early goal is to mature your Fire-Starter, or reinstate him if he dies, and for this you will need a black portal. If you do not start with a black portal, get a daughter that gives you one.
- d. **First Alpha.** Once you have 3 colors of portals, a goal is to acquire an Alpha. The brain domain that holds the 3 colors determines what sort of Alpha this is (**E5**).
- e. **Flip To Tribal.** Once you get 5 colors of portals, it is time to switch from vocal to tribal (**I1d**).

## GLOSSARY OF TRIBESMEN ROLES

Each Meeple-token is a **tribesman**, who assumes a role depending upon where the token is located! The "PA" icon means *permanent assignment* (**E4**).

**Alpha** (large tribesman) - anywhere (**E5**), but with an Elder mentor can have small game, big game, and/or club special powers.

**Baby** - Unassigned tribesman added from the deadpile by successful hunting, gathering, or domestic animal (**A1.4**).

**Chief** (PA) - Rank 1 tribal Elder, prevents *chaos* (**D4**) as the tribe grows larger, and allows *negotiations* (**F1**).

**Dependent** - Each Elder, unmarried daughter, and domestic animal in your tableau. Each must be supported in a *blizzard* (**D5**).

**Elder** (PA) - Any tribesman on a Placard. They are *ranked* from 1 to 6 (**A1.6**).

**Fire Starter** (PA) - Rank 6 Elder, prevents loss of Elders during chaos, frostbite, and allows cost-free Elder promotions (**C0.6**).

**Gatherer** - Any Hunter on a biome with the *basket icon* (**F3**). This adds a Baby if promiscuous or has a gathering wife/daughter.

**Hunter** - Any tribesman (including Alpha) that makes a *hunt roll* (G), either assigned to the north or south row, or to a daughter as a Suitor.

**Husband** (PA) - In the *husband box* (G1) of a daughter. Obtains her abilities if mature. Makes an *attack roll* (F2) vs. Suitors.

**Knapper** (PA) - Rank 3 Elder, enables your Alpha for auto-roll vs. big game. If tribal, invents “I” hand cards using *tool-making* (I3).

**Placard** - The square card where Elders are stored (E2). Can be vocal or tribal.

**Shaman** (PA) - Rank 2 tribal Elder, able to *domesticate* “D” hand cards (I3). Shaman is also the name of 1 of the 3 *portals* (II).

**Suitor** - Any Hunter on a daughter card outside the husband box (E3), regardless if the daughter is married, immature, foreign, or promiscuous.

**Trapper** (PA) - Rank 5 Elder, enables your Alpha for auto-roll vs. small game. If tribal, invents I hand cards using *tool-making* (I3).

**Wanderluster** - Unassigned tribesman of a foreign color (D6). He must be chaperoned.

**Warrior** (PA) - Rank 4 Elder, enables your Alpha for auto-roll in club biomes, decides the *first player* (A2), and doubles kills in *attacks* (F2).

**War Party** - If you have a Warrior Elder, all your tribesmen in *attacks* (F2) kill on each “1” or “2”.

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### TEXT ON BACK OF BOX:

The first words. The first art. The first bad jokes.

It’s 43,000 BC in Ice Age Europe. You are one of three species: Archaic, Neanderthal, or Cro-Magnon.

Assign your males to hunt Pleistocene megafauna while avoiding predators. Assign women to gather or teach children new words. Specialize Elders for fire, inventions, or animal domestications. Choose between promiscuous, harems, or pair bonding mating systems. You may merge this game into a game of *Greenland*.

First Edition Cover art by Phil Eklund (foreground) and Mauricio Antón (background). A Neanderthal father teaches his mulatto son to hunt. Genetic studies indicate that Neanderthals interbred with modern humans freshly arrived from Africa 45 kya. This hybridization somehow sparked the invention of art and culture in both species. Waves of innovation obsoleted tools used without change for 200,000 years such as the handaxes and Levallois thrusting spears shown.

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## A WORD IS WORTH A THOUSAND PICTURES

An essay using words, not pictures, by Phil Eklund

Are you a visual person, or a phonetic one? Do you think better in images or words? Most would insist the former. But most are wrong.

A MODERN HUNTER-GATHERER. Introspect on one of your thoughts. Pick a simple one, perhaps “I should go to the market today”. A string of 7 words, with grammar and syntax. For phonetic person, this is a few bytes in

temporary memory, enabling a life-sustaining decision within a fraction of a second. How would a visual person express this thought and come to a decision without words? Perhaps with a video of herself walking to the market. This would take megabytes of memory and a minute of time.

THE PRONOUN PROBLEM. But this is only the beginning of difficulties for the visual person. A simple video of a walking person in no way expresses the pronoun “I” as an analog for oneself. Animals do not recognize or identify with pictures or movies made of themselves. The very concept of a pronoun can’t be expressed in images, perhaps the reason why primitive tongues, for instance in the pre-Columbian New World, do not have the pronoun concept.

UNIT FORMATION. Other words in our sample thought that cannot be translated into pictures include the modal verb “should”, the preposition “to”, and the adverb “today”. Yet all are vital for the proper decision-making enactment of this thought. The verb “go” can be expressed in a movie, but only in an excessively concrete-bound fashion. For instance, a sequence showing a walking person excludes the possibility of alternatives such as a bike or car. But for a phonetic person, the verb “go” expresses the action *without specifying the means*. This “unit-formation” is very much like algebra, where “X” is a *unit* of any unspecified value. *Unit economy* enables human cognition to reduce a vast amount of sense information to a minimal number of units, and the unit becomes the link between mathematics and reality.

MEASUREMENT. A standard named as a word automatically becomes a unit appropriate for the first measurements of time or distance beyond the perceptual level. For instance, “X” days, or “X” feet. The first archeological evidence for measurements are tally sticks dating to more than 20,000 years ago (20 kya).

WORDS VERSUS CONCRETES. This “algebraic” flexibility of a word encapsulates the essence of something, while leaving unnecessary concretes out. A photo isn’t and can’t. Further, a word has enormous flexibility in input/output. It can be spoken, thought, gestured (as in sign language), written, grammatically combined with other words, or stored with very little memory. A photo can’t. Words are altered by syntax and grammatical endings. A photo can’t, other than the temporal sequence in which a series of photos are viewed. As Aristotle proved in the *Organon*, words can be logically combined into propositions, arguments, premises, and conclusions. Finally, a word can be metaphoric, thus opening up mental “portals” and integrating elements through induction. A photo can’t.

For instance, the phonetic person uses the noun “market” as a placeholder for any market, leaving the decision for *which* market for a later thought. But the concrete-bound visual person must picture a specific market. Imagine what this means if she actually tried to come to a decision without using any words. She would have to run a video in her head of every possible means of transport going to each possible destination. If there are three ways to travel, and three possible destinations, she would have to watch nine films, recall the details of each one, and then choose among them. Making all the decisions *at the same time*. Add just a few more variables, and the human head would run out of memory space (video is a memory hog). But a phonetic person would think: “I should go to the market today. Maybe that new one I haven’t tried yet. But I’ll take the car, since the forecast is for snow.” This leads to three reasoned decisions, made *one after the other*, with almost unlimited syntactic variability! This is because every word is an economy of thought worth a thousand pictures.

Aristotle realized that words for qualities or essences rather than concretes, such as “market” and “go”, were the common ground between the objective and subjective worlds. Between reality and our metaphors for reality. In this he disagreed with his teacher Plato, who maintained that qualities were in a higher plane of reality, of which we only experience the shadows. Today neo-Platonism is the dominant philosophy, although there are still a few Aristotelians such as myself.

SELF-COMMUNICATION. Notice that the primary use of words is *communicating with yourself*, not with others!

The key is that a phonetic person is capable of unit-formation, defining “unit” as “a concrete regarded as a separate member of a group of multiple similar members.” For instance, various specific markets are units subsumed under the concept “market.” The ability to regard entities as units is distinctive to modern lingual humans. This is why animals and pre-lingual babies are unable to count beyond the number of concrete objects they can subitize (i.e. metaphysically perceive, up to about seven objects).

THE VERB PROBLEM. Koko and Kanzi, the famed primates able to communicate using American Sign Language, are quite adept with adjectives and nouns, but seem unable to formulate verbs or sentences. What is the problem with verbs? Because every action needs an actor, a verb cannot be pictorially visualized without a noun. And this bonds the verb to a specific actor: “I go to the market”. But unlike a picture, the word “go” divorces the action from the actor, as well as from specific means of going. Koko and Kanzi seem to be able to use gestural words with others, but not as a unit of thought.

VERBAL HALLUCINATIONS. 99% of your thoughts are *verbal* hallucinations. You imagine hearing the spoken word rather than seeing the written word. Try counting in your head from, say, 10 to 20. Introspect. You mentally *heard* the words “ten”, “eleven”, “twelve”, etc. in your preferred language. Now try again, appending images of the Arabic numbers “10”, “11”, “12”, etc. to the spoken words. This slows down your counting, but with practice it can be done. Now try imaging the “10”, “11”, “12”, etc. *without* hearing the words. You will find it impossible. Purely notational icons such as Arabic numerals, punctuation marks, arrows, stop signs, etc. are useful only in their written form. Only icons you can “hear” can be retrieved and processed as verbal hallucinations, which is why you can speak before you can read.

Much of this “aha” cognition takes place below our verbal stream of consciousness, including judgments, reasoning, induction, pattern recognition, and learning. Oceans of information are automatically processed this way using ancient pathways, as revealed in the Marbe experiments at the Würzburg school. I do not call these cognitions “subconscious”, reserving this term for the daily routines we consciously program ourselves to perform automatically.

THE BIG USELESS BRAIN MYSTERY. The human and Neanderthal brains reached their modern size 200 kya, yet the archeological record shows no advances in tools or behavior until 45 kya. What were they doing in all that time with their huge brains? Perhaps building up a social vocabulary, used for courtship, dominance, and status games. Perhaps to verbally express who dominates who, and who belongs to who. These vocalisms, like all animal communication such as warning cries, birdsong, and snarls, are expressions of behavior, but play no internal role on how behavior is decided. But one day, the first *word* was uttered, defining “word” as a vocalization that can be both spoken and used as a cognitive unit.

THE FIRST WORD. What was this first word? Perhaps someone’s name! Names associated with rank or class may have been used for millennia, and imitated through the generations. But on one fertile day around 45 kya, someone used a verbal hallucination of a name as a cognitive placeholder, perhaps to untangle a social problem. This was the first word, and the first verbal thought, as well as the most momentous invention in human experience. She was not conscious of her thought, as consciousness was still thousands of years in the future. But sharing spoken and mental concepts was an effective means to mentally manipulate the named person. And the spread of words from the social domain to the brain domains associated with technical and natural history knowledge allowed explosive progress in tools and food storage.

Many young birds and mammals use an “imprinting” algorithm to recognize their mother and others of their species. This mechanism, quite distinct from associative learning, occurs in the brief period after the beginning of locomotion and before the onset of fear. It’s very speculative, but perhaps the communicative sound of the word

“mama” in a prehistoric family became imprinted on a child, who was able to use this sound in her thoughts as an icon for her mother. If so, the very first word may have been the first word of most children: “mama”.

VERBAL MEMORIES. The use of words allowed human memories to be stored in the new verbal format. The few exceptions seem to be sensations such as tastes, smells, and touch. But what about remembered and imagined images anyone can form in one’s head? Today’s brain has the remarkable ability to retrieve strings of words out of storage, and use them to create a manipulatable image in a special mindspace, sometimes called the *tabula rasa* (blank slate). By making these verbally-formed images dance in this mindspace, we can use narratization to compare alternatives and come to a decision.

If a person is asked to give details on a particularly vivid memory, it becomes quickly clear he is not examining a mental photograph accurately retrieved pixel by pixel. A simple question: “What is the shape of the frame of your memory?” turns out to have no answer. The image has no frame, no boundary, exactly as if its elements were conjured up from words rather than a certain number of rows of pixels. If the memory is a dynamic one, and the person is asked at what point does the film stop and replay, again there is no basis for an answer. Nor can the person give a consistent response to the spatial relationship between remembered elements. Every policeman knows that eyewitness accounts are valid only for certain notable elements. As if they were reconstructing the visual crime scene from a description in a book. The gaps are filled logically, using general data the brain has stored about the category. “Why of course the perp had five fingers on his hand officer, every hand has five fingers.” If memory was like a surveillance tape, one could in theory run the tape backwards to a certain day when one was looking out a window, stop the film, then write down the license number of a car going by. But the verbal data compression of memory is far more parsimonious than that.

Memories stored as sentences explain why you can’t recall scenes from infancy, before you had the vocabulary to reconstruct images. Infants are able to learn, just as a flatworm in a T-maze can learn. But learning to turn left in a T-maze is distinct from remembering to “straight-left-straight”, a process that requires mastering the verbal concepts of “straight” and “right” and “left”.<sup>45</sup>

“Memory artist” savants, such as Franco Magnani and Stephen Wiltshire, have the remarkable capacity to paint detailed scenes from childhood memories, or from seeing a landscape just once. Comparing their work to photographs is stunning. But the distortions are revealing: depicting scenes from a perspective the painter could not have attained, combining elements from different points of view, shifting spatial relationships, exaggerating some features, and introducing anachronisms. Exactly the distortions you would expect if the image was constructed from a rich set of verbal instructions. This is not “photographic memory”.

Are memories verbal or visual? A simple experiment anyone can perform gets to the truth of the matter. Go to your library, and open any book to a random page. Look at it for a few seconds, enough to get a mental image. Now try to reconstruct the page from memory. If the page were stored as a picture, you should have a blurred photograph in your mind’s eye. Maybe a few letters would be recognizable, and you should be able to count the lines of text, even if too blurry to read. And you should be able to see on this photo which line of text each of the letters you can recognize are located. Of course, a real remembered reconstruction is vastly different. A few snippets of phrases are remembered. But their position on the page is unknown. This is because the memory is stored verbally.

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<sup>45</sup> People normally can’t store memories in picture form, but most can “reconstruct” a crude mental image from sentences stored in long term memory. However, 2016 it was discovered that many cannot perform this reconstruction, and yet live normal lives. They enjoy novels more than movies, remember faces from describable features, and have some trouble finding their cars in the parking places, see: <http://www.bbc.com/future/story/20160524-this-man-had-no-idea-his-mind-is-blind-until-last-week?>



Incidentally, in this experiment, for 999 times out of 1000, the random page you open will contain far more information in verbal format than in picture format. This is because all book writers know that it is far easier to express any significant idea with words than pictures, and each word is worth a thousand pictures. And because the printed word resonates with the hallucinated spoken words we all think with, it's unlikely the humble book will ever be supplanted by audio-visual gizmos.

A variation of this experiment was performed in 2013 at the Kyoto University's Primate Research Center. The Arabic numbers 1 to 9 arrayed in a random pattern were flashed for less than one second on a monitor. Chimpanzees performed far better than humans in pointing to where the numerals had been on the screen in the correct numerical sequence. This is strong evidence that the chimp short term memory is far more visual than human memory. See the video here <http://www.independent.co.uk/news/science/video-chimpanzees-have-faster-working-memory-than-humans-according-to-study-8496034.html>

PERCEPTS. It is unknown how animals and pre-lingual humans process percepts, which is the name for concepts formed by direct perception, without the use of words or unit-formation. A baboon, for instance, might see only the tail of a lion, prompting an integration plunking the percept "lion" into its flight or fight algorithm. There is evidence that percepts are formed in the "processing" right side of the animal brain, and enacted in the "executive" left half. Communication between the halves encrypts these percepts in a proto-word format, but is unable to categorize them into units. But the new verbal format surmounted this limitation.

COGNITIVE FLUIDITY. For almost their entire history, neither Neanderthals or modern humans showed any trace of what we would call "culture", such as art or religion. According to Leda Cosmides and John Tooby, this was because the ancient human brain was compartmentalized into social, technical, and natural history domains. Information from one domain seemed unable to be utilized in other domains. For instance, a human adept with knapping was puzzlingly unwilling to whittle antler or bone, perhaps because stone was mentally processed in the technology domain, while bones were processed in the "natural history" domain. Cognitive fluidity in self-communication was achieved only when the new verbal format surmounted this software incompatibility.

As words from one domain got entrained in the context of another, the crosstalk sparked the "cultural revolution" of 40 kya, when the first carved bone and antlers points, cave paintings, figurines, flutes, burials, and other cultural artifacts appear. By mixing domains, humans for the first time could express multicomponent tools made from materials other than sticks and stones (the first technology), elders able to be referred to after they died (the first proper names and grave goods), female statues acting as the authority for actions (the first idols), and anthropomorphic animals that could walk and talk (the first jokes).

THE CRUCIAL PRONOUN. The discovery that the famous cave paintings had been continually retouched for thousands of years suggests they were used as blackboards, perhaps to reinforce the neural pathways used in "blank slate" formation, visually and tactilely reinforcing the neural pathways used to form pictures from words and to regard animals as units. This didactic purpose explains why the paintings were so eerily similar throughout the inhabited world. The handprint stencils found on so many may have been the first attempts to articulate the pronoun "I", a crucial concept on the road to consciousness.

THE PORTAL THEORY OF JOKES. In the animal kingdom, humans are the only ones to laugh and tell jokes. What's so funny? What is a joke, and what possible survival value can come from privately laughing at it? A joke is an incongruity of language, such that a word created for one context has an unexpected connotation when used in a different context. Laughter is an audible sign that one recognizes this scope creep of the concept, bridging two areas as a form of inductive logic. This is simulated in the game by placing an inductive portal.

## MY STRUGGLE TO INCLUDE CULTURE IN NEANDERTHAL & GREENLAND

ART VS. DARWIN. I remember a restless morning in Colorado being bothered by the explanation and categorization of the Anasazi artifacts we had uncovered the previous day. Labeling them objects of worship or art, or means to attain the afterlife or to ward off evil spirits seemed facile, given that all irrational beliefs have no survival value by definition and that no other animal exhibited behavior so contrary to its own survival and that of its descendants.

CAUSES OF CULTURE. Science is an affirmation of the law of causality, the idea that everything has a natural cause. (By "natural" I mean anything that can be understood by the study of the Laws that govern its properties and behavior.) What bothered me was that the archeologists were faced with a novel phenomena unprecedented in the animal kingdom, yet seemed uninterested in including its cause in its definition. Causes are particularly important for a game-maker, who must either provide a rule, or else tell the players to roll the dice. Nothing can be left undefined or acausal.

MODERN FANTASIES. But it is not just archeologists. If you ask someone why they decorate their homes or offices, listen to music on the way to work, tell jokes, or daydream about sex or love, they look at you strangely. Too immersed in something to realize how bizarre it is. If we can't explain our own motivations, how much more difficult is it to describe its origins in pre-literate peoples?

DECISION-MAKING. Animals make decisions based upon mental states called emotions, set by internal and external cues. My thesis is that culture is an alternative authorisation for decisions that superseded (to some extent) the emotional ones. Culture is stored in memory in the new-fangled lingual format unique to humans, although it is intertwined with little understood ancient formats. Like remembering "earworm" jingles, both the words and the artistic music/beat are important. This would ignite both free will and consciousness, previously defined as decision-making modes based upon the software of language.

CULTURE SCALE. The two types of software associated with the evolution of culture makes it possible to define one's conscious identity as a measure of art versus ideology. This allows a game-maker to set a scale that can distinguish the culture of society A from society B. In Greenland, the now extinct Tunit left behind far more art than the Thule or Norse, such as intricate ivory carvings. Perhaps they used these as portable tactile icons to help them remember important concepts, lacking the words to put these concepts into thought. Perhaps their limited language, now lost, is related to their pacifism. The Viking Greenlanders, a literate culture with a sophisticated lexicon, left a more enduring legacy with their sagas and stone churches.

MODERN CULTURES. Modern cultures are defined by ideology, the power of ideas and concepts to identify the way the universe works. Humans and their moralities are defined by their specific nature, a nature defined by the origins and causes of consciousness This was discovered during the Enlightenment, and cemented by Darwin's discovery that humans are animals. Ideology is at the root of the famed Viking raiding mentality and for their lesser appreciated mercantile economy. It is even more true for the Nazis, who unambiguously proclaimed what they stood for and then walked the talk. Nobody can accuse the Nazis of half-heartedly applying their statist philosophy.

FUNDAMENTALS. In order to learn from history, or to make a game about history, one must distill ideas and events to their fundamentals. I am puzzled by those who insist I use politically correct terms, such as "European" instead of "Viking" or "German" instead of "Nazi". Using euphemisms obscures the essential differences between right and wrong, civilization and savagery. For understanding as in gaming, clear definitions are essential.

**PLAYTESTING STATUS: CLOSED REV C1.2**

The published rules version is C1.2 (Apr 22 2015)

The published cards version is C1.2 (Feb 20 2015)

D1.0	Added Troubadour option. Changes in green font are errata to published first edition.
C1.2	Graphics and icon overhaul by Karim, all cards and Placards. Small changes to Negotiations. May now court your own married daughters. Published as first edition.
C1.1	Added sultan's exception (E4), and made jealous husbands into War Parties. The minimum bid is one disk at all times. E3 and G1 changed to allow contests of married daughters, and also allow the winners of such contests to begin mature. Removed "rape" as a game term. Cylinder instead of figurine,
C1.0	Wanderlust revised to drop the limbo concept. Removed grooming and bone marrow scavenging from the game. Revised sexuality cards to remove the Vocal Limits, MPI rating, and Fecundity rating, and to make promiscuous a grazing species. The two types of "I" cards merged into one "I" card. Revised the special ability of most every daughter. Removed ability to avoid predator attacks by assigning one Hunter to it per G4. Changed solitaire game per Juan's recommendations. Change player order, the second star now indicates the color of the second player. In D6, Wanderlust rewritten so as only one per eye icon is lost, and it retains player color even in service in foreign tableaux. You are safe from chaos if the number of Hunters is less than or equal to your vocabulary (B3). Victory Points: Hunter Cubes: 1 (PB), 1 (HH), 2 (P), Alpha: 2 (PB), 1 (HH), 1 (P), husbands: 3 (PB), 1 (HH), 1 (P), daughters: 1 (PB), 2 (HH), 1 (P), trophies 2 (PB), 4 (HH), 3 (P), D cards: 4 (all sexualities), inventions: 3 (all sexualities), disks: 1 (all sexualities). SOP changed to add gathering to the end of Phase 3, and to immediately discarding down to hand size rather than at end of Phase 6. 12 biomes modified to add "Gathering". You now need two Hunters to support each dependant during blizzards. Added courtship, rapes, homosexuality, and eusocial "human hive". Conversion to Tribal occurs with 5 instead of 6 portals in the 3-player game. The Fire Starter given the ability to cost-free promote elders, and the Chief given the ability for cost-free elder actions.
B1.3	Tribal players disallowed from participating in the culture auction! Exception: Tribal players with harem-holding sexuality can bid, but their bid counts half (rounding up). If promiscuous, Trophies, domestic animals, and inventions count as 2 VP. Husbands, elders, daughters, and disks are worthless. Changed big game and predator biome cards to make black disks less preconditional and more accessible.
B1.2	Changes: A. The three Vocal Alphas played as elders with 3 preconditional portals. B. Asymmetry in Brain, started with one portal (red = Cro-Magnon, black = Neanderthal, white = Archaic) C. Removed cards from rows leave a gap, and Row cards are NOT shifted (G1). D. Require 6 Portals to go tribal. (i.e. 2 disks on each portal). Require 3 portals (1 of each color) to gain an alpha ability. E. Added Vocal Actions to Phase 6, so that Neolexia and Portal actions occur each turn. This means elimination of Speech Balloon Event. F. Reduced elder death frequency. G. Portals do not count towards preconditions. H. Increase MPI in all sexualities one step. J. Alpha is not a starting piece, and can be brought in only after its corresponding alpha is installed. K. Promiscuous are not allowed to place husbands, but may attack foreign husbands in their tableau. M. If you are harem-holding, you need only 5 portals instead of all to convert to tribalism. N. Neolexia changed to an optional Phase 6 action that does not need a daughter. P. All daughters now have a Portal Action.
B1.1	In D7, per a suggestion of Chuck Parrot, half of the wanderlust Hunters of all players wander to other players. Previously it was only the player with the most lost Hunters whose Hunters wandered to other tribes. As a small rule change, I am making the Vengeful husband rule in F2 effective only for Harem and Pair bonding Sexualities. Card changes: Flint mines changed, conjugal woman replaced by flutist, Joking woman and Scheherazade have additional text for what happens if they are married, the front side of brain maps corrected the flip to Tribal conditions from Phase 6 to Phase 1. New B1.1 Vassal created by Stefano.
B1.0	Removed from game Starting Portals, Flint Rule, Survivalist Game, Sexual Arena Auction, Travois, Travel Costs, Snowflake Icon, Upkeep, Exchanging disks for value, homeland. Monogamy re-instituted. Married daughters are always faceup. Wanderlust Event added. Vocal players can now attack. Both Portals and Neolexia changed to be an event. Neolexia changed to allow a disk from any domain. SOP changed to remove Portals from Phase 6, add gathering to Phase 5. Hand Limit is now # of elders. SOP changed to add discarding down to hand size at end of Phase 6.

	<p>Added MPI (Male Parental Investment) to the game in D5.  Cards displaced during global cooling or warming now automatically knock-out the cards they displace to.  Vocal Limits changed.  Players start with two of each disk.  If you are promiscuous, then you count your unmarried daughters as unassigned tribesmen during chaos.  Hand size = # of elders.</p> <p>CARD CHANGES: MPI each ♀ is 3  Changed the back of the daughter cards, replace procreation with gathering.  Changed daughter cards from Cold Cards to Warm cards, allowing higher success for Sabine raids.  Changed domestic animals to remove the travois &amp; snowflake icons, and to allow accumulation of disks.  Marrow Scavenging and Grooming added to about a dozen of each biome, as "consolation prizes".  Predators changed from "big game" to "club" biomes.  Sexuality changed from one-sided Public Card to two-sided Starting Card.  Fire Starter no longer spends wood for its anti-chaos action.  Predators have increased climax.  Completely changed sexuality cards &amp; victory conditions to be sexuality dependant.</p>
<p>A1.0</p>	<ol style="list-style-type: none"> <li>1. Populations are running too low. <del>Solution 1: I am going to try adding an "expend 1 energy, gain 2 Babies" function to the Fire Starter.</del> Solution 2: Add one more Baby to most of the hunting successes. Solution 3: Added 2 more small game, birds. <del>Solution 4: Reduce chaos?</del></li> <li>2. Acquisition of women avalanches to "harem" style victories, with the number of women far outnumbering the Hunters. The basic problem is that women grant you the vocabulary to acquire more women.  Solution 1: Change the snowflake icon into a dependents icon, whereupon you pay disks if you have more dependents than Hunters + husbands. (Dependents are elders, women, and domestic animals). <del>Solution 2: Have population count double at game end if you have at least as many Hunters + husbands as dependents.</del></li> <li>3. The game is a bit too short. The polytheism is barely getting started at games end.  Solution: <del>Not sure if should start with 2 more events, or</del> add one more Würm glacials.</li> <li>4. Polytheism is too big of a disadvantage at first, because it scrubs the disk victory condition. Solution: Allow Polytheism to use either disks or trophies as victory, whichever greater.</li> <li>5. Problems with order of play in Phase 6. Solution: Add "Portal" action right after Neolexia and before Elder Actions.</li> <li>6. Predators are too flexible, not allowing strategies for avoiding them. <del>Solution: Change rules so predators attack the closest only, or the first player if more than one equally close.</del> Solution 2: Special rule that predators can't cross glaciers.</li> <li>7. Asymmetrical starting, each species gets 1 portal to start,</li> <li>8. Added human sexuality event, and public deck to auction. The idea is to have players have more interesting decisions with daughter assignment, a bit like the demography in the Origins Game. Sexuality auction and Procreation added to the Sexuality Event.</li> <li>9. The Fire Starter seems weak. I have not done anything about this however.</li> <li>10. Increased trophy points by 25%.</li> </ol>