

From Savagery to Greatness

Stair-steps to Humanity

by Scott Crosby

Charcon 2019 Class Handout

See also: Charcon.ScottCrosby.Net

The Evolutionary Transition from Genus Ardipithecus through Genus Australopithecus to Genus Homo to Species Sapiens

Note the evolution of eyebrow ridges and brain-case size and position of the brain case from behind the eyes to above the eyes.



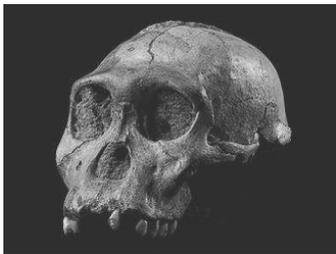
1. Ardipithecus 5.6-4.4 mya

Lived very shortly after the evolutionary divergence of hominins and chimpanzees.

Note the similarity to chimps: larger canines, small brain case, large skeletal attach points for strong jaw muscles.



2. Australopithecus anamensis 4.2-3.8 mya
earliest species of Australopithecus



3. Australopithecus sediba ~2 mya
ancestor to Homo habilis



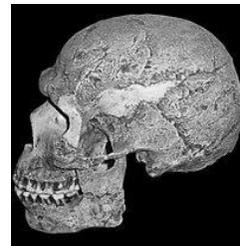
4. Homo habilis 2.3-1.5 mya
earliest species of genus Homo



5. Homo ergaster and Homo erectus
1.9-1.4 mya 2 mya - 70 kya
H. ergaster (Africa)
= earlier form of H. erectus (Asia)?



6. Homo rhodesiensis
800-200 kya
predecessor to Homo sapiens



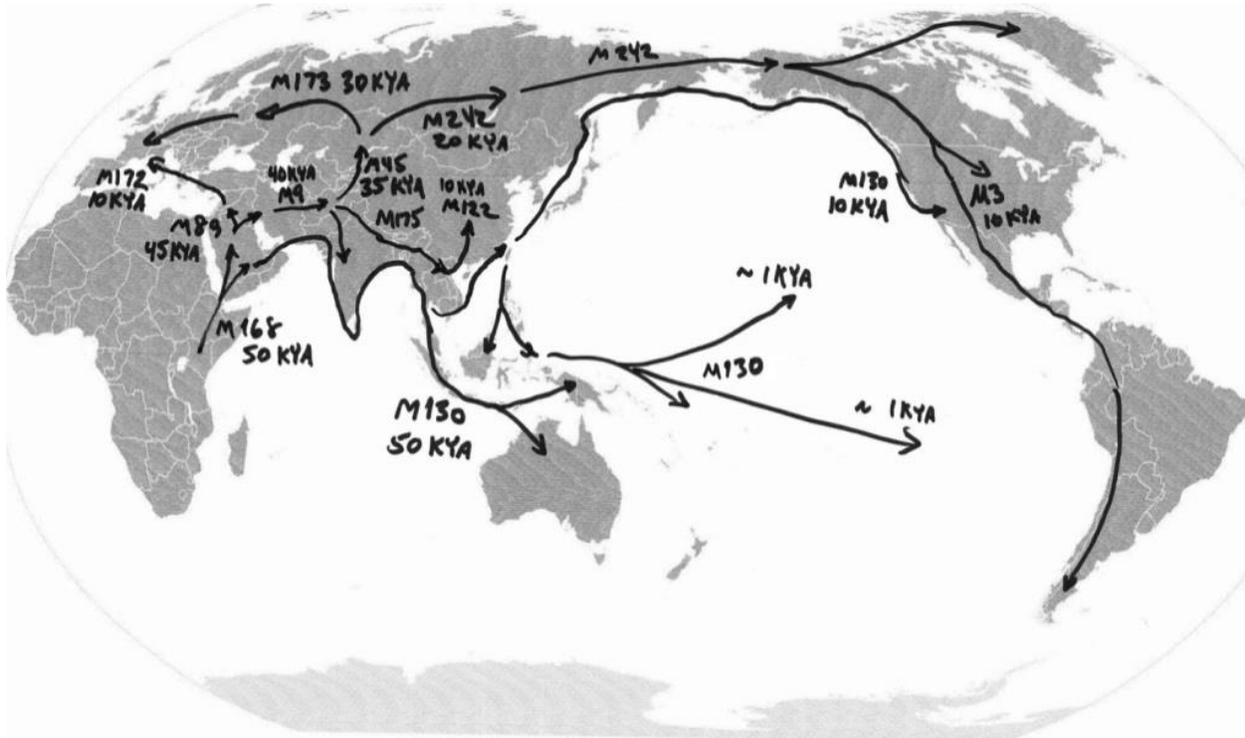
7. Homo sapiens - since 300 kya

Map of Homo Sapiens' Paths of Migration

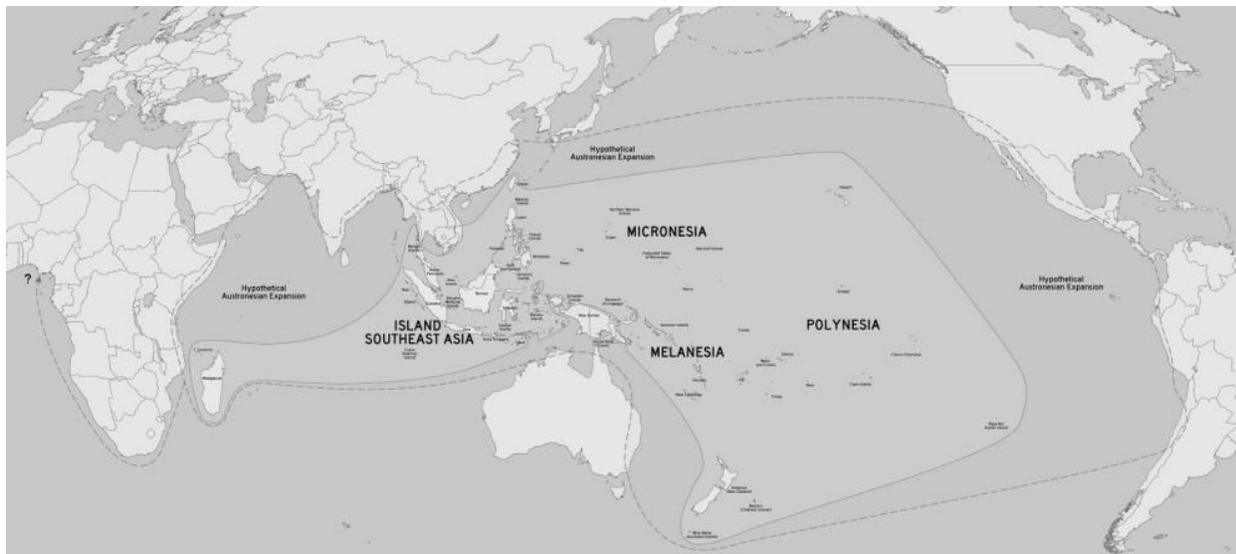
Migrations and genetic markers from *The Journey of Man – A Genetic Odyssey*, by Spencer Wells.

M-codes indicate genetic markers.

KYA indicates thousands of years ago.



Oceanic Journeys of M130s, the first Oceanic Navigators



Note that the hypothetical journeys were no longer than some actual journeys

Rome's first interaction with the Greeks (colonies) – 700s-800s BC



Timeline of Relevant Events

Key:

KYA thousands of years ago; multiply the given number by 1,000.
As much as possible, all dates are given in KYA, to maintain a single perspectiv.

MYA millions of years ago; multiply the given number by 1,000,000.

BYA billions of years ago; multiply the given number by 1,000,000,000.

M-numbers

denote genetic markers which can be used to identify specific populations.

“M-number to M-number”

indicates that a migration began from an area where the first M-number lived, but which later had a specific genetic change to the “to” M-number, which can be used to uniquely identify the migrating population.

| KYA | other references | event |
|--------------------|-------------------------|---|
| | 13.7 bya | Big Bang creation of the current universe with its laws of physics |
| | 4.55 bya | Creation of Earth complete |
| | 4 bya | First life on Earth |
| | 2.4 bya | oxygen atmosphere on Earth |
| 670,000 | 670 mya | first animals |
| 850,000 to 630,000 | 850-630 mya | "Snowball Earth" - Earth's worst Ice Age Note: lasted for 220 million years - longer than duration of the dinosaurs |
| 440,000 | 440 mya | extinction event - most species perish Ice Age caused by asteroid dust? |
| 395,000 | 395 mya | first insects on land |
| 365,000 | 365 mya | extinction event - 70% |
| 313,000 | 313 mya | first reptiles |
| 300,000 | 300 mya | first mammals - from mammal-like reptile - "pelycosaur" |
| 290,000 | 290 mya | extinction event - 90% |
| 235,000 | 235 mya | first dinosaurs, flowers |
| 160,000 | 160 mya | first placental mammals |
| 150,000 | 150 mya | first birds |
| 140,000 | 140 mya | split of South America away from Africa |
| 114,000 | 114 mya | first modern mammals; global cooling |

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| KYA | other references | event |
|-------------|-------------------------|--|
| 100,000 | 100 mya | split of Australia (including New Guinea, Tasmania, New Zealand, Antarctica) away from Asia |
| | | Antarctica marsupial fossils match Australia |
| | | result: indigenous mammals are marsupial pre-placental (platypus, kangaroo, etc.) only; also, no primates |
| 65,500 | 65.5 mya | extinction event - 50% - end of most dinosaurs (birds are dinosaurs) and all animals over 55 pounds |
| | | due to meteor impact on the Yucatan peninsula |
| | | rise of placental mammals |
| 50-55,000 | 50-55 mya | first primates |
| 50,000 | 50 mya | India begins to collide with Asia, forming Himalayan Mountains |
| 35,000 | < 35 mya | monkey migration to South America tailed monkeys; eg, spider monkeys vs. Old World "tailless" monkeys |
| 30,000 | 30 mya | Antarctica split away from Australia |
| 24,000 | 24 mya | Global cooling Antarctica covered with ice |
| 20,000 | | Rift Valley (in eastern Africa) active for the last 20 million years = constant change which facilitates constant evolution |
| | | static jungles have little change in species; no need to adapt |
| 15-23,000 | 15-23 mya | first apes (typically ground-dwelling) ancestors of chimpanzees, gorillas, orangutans, man |
| | | during relatively short global heat wave |
| 9,000 | 9 mya | gorilla split from human-ancestral line of apes |
| 5,650 | 5.65 mya | chimpanzee split from human-ancestral line of apes |
| 5,600-4,400 | 5.65-4.4 mya | Ardipithecus post-split, pre-Australopithecines; ancestral to Man |
| 5,000 | 5 mya | very dry, less forest, more savannah |
| | | drove tree-dweller primates out of trees |
| | | the need to hunt drove brain changes |
| | | changing environment requires adapt or perish |
| 5,000 | 5 mya | creation of Mediterranean Sea (inflow from Atlantic Ocean at Strait of Gibraltar) |

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| KYA | other references | event |
|-------------|-------------------------|--|
| 4,500-1,977 | 4.5-1.977 mya | Australopithecines – ancestral to man |
| 4,000 | 4 mya | earliest bipedal (i.e., 2my prior to large brains) |
| 3,390 | 3.39 mya | earliest tool-making - by Australopithecines (possibly also Paranthropus?) |
| | | implies abstract conceptualization |
| 3,000 | 3 mya | begin of period of coldest average temperatures ever (except for 330-250 mya) |
| | | last time average temperatures were as warm as currently |
| | | formation of ice year-round at the North Pole |
| 3,000-12 | | average temperatures colder than currently except for four brief spikes |
| 2,700 | 2.7 mya | first species of Genus Homo Habilis / Ergaster (debated) |
| 2,600 | 2.6 mya | extinction event (33%) due to radiation from super nova 150 light-years away |
| 2,500 | 2.5 mya | beginning of repeated glaciation - Ice Ages |
| 2,100-1,500 | | H. Habilis (should be A. Habilis?) |
| 2,100 | -1,500 kya | H. Erectus (Asia) / H. Ergaster (Africa) - same ?? |
| 2,000 | -700 kya | H. Erectus in Asia (extinct before occurrence of H. Sapiens) |
| 1,900 | - 1,400 kya | H. Ergaster in Africa |
| 1,800 | 1.8 mya | H. Habilis / Erectus migration from Africa to Asia "Java Man", "Peking Man" |
| | | first Genus Homo out of Africa |
| 1,500 | 1.5 mya | earliest use of fire |
| 1,200-800 | 1 mya | H. Antecessor ??? (theorized) between H. Ergaster / Erectus and H. Rhodesiensis |
| 700-500 | | common ancestor of H. Sapiens and H. Heidelbergensis, H. Neanderthal, H. Denisovan |
| 800-400 | | H. Heidelbergensis in Africa |
| 700-200 | | H. Heidelbergensis in Eurasia |
| 650 | | H. Denesova / H. Neanderthalis migration from Africa |
| 440-40 | | H. Neanderthals in Eurasia |
| 800-120 | | H. Rhodesiensis in Africa predecessor to H. Sapiens) |
| 200? 400? | | first H. Sapiens fossils in Omo Kibish, Ethiopia |
| 150 | | "Eve" - common female genetic source |
| 125 | | similar tool-making techniques whole east coast of Africa; coastal culture |
| | | "garbage" dumps - "surf & turf": clams, oysters, rhinos, elephants; stone tools |

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| <u>KYA</u> | <u>other references</u> | <u>event</u> |
|-------------|--|--|
| 110 | | start of last ice age |
| | | large-scale drying of Africa during last ice age - reduced food sources; innovate or migrate |
| 100 | | last H. Erectus in Asia could not adapt to cold? |
| 100 | 194-177 kya? | H. Sapiens in Israel (Levant) |
| | | Levant (Mid-East) part of the range of H. Sapiens prior to 60 kya |
| 100-80 | | Sahara less desert; H. Sapiens lived there |
| | | lower temperatures - Sahara expands |
| | | higher temperatures - Sahara contracts |
| 80 | | not true migration; died out or returned to Africa |
| | | replaced by cold-adapted H. Neanderthals |
| after 80 | | average temperature dropped 10°C / 18°F |
| | | disappearance of Sahara species |
| 70-50 | | climate getting colder - forest shrinking replaced by savannah, steppes |
| | | greater tracking, hunting skills required |
| | | more complex tool-making, social skills |
| | | population reduction to 3,000-10,000 individuals - near extinction |
| after 70-50 | | population expansion |
| 70-50 | occurrence of undocumented genetic change <i>maybe</i> "Adam"? | transition to "Upper Paleolithic" or "Late Stone Age" tools |
| | | radical improvement of H. Sapiens tools vs. H. Erectus, H. Neanderthal tools |
| | | first appearance of Art, more efficient food harvesting, improved language, communication |
| | | setting aside resources - requires planning - evolved from basic abstract conceptualization |
| | | i.e., two steps to epistemology - basic and advanced abstract conceptualization |
| 60 | | start of H. Sapiens migration out of Africa - Djibouti to Yemen |
| 59 | M168 | "Adam" - common male genetic source; 79-31 kya |
| 50 | | Sea levels 300 feet lower due to water in Ice Age glaciers |
| | | coastal migration routes used, which are now underwater |
| 50 | M168 to M130 | first H. Sapiens migration from Africa to Asia - coastal dwellers |
| | | extension of same coastal culture as in Africa since 125 kya; same resources, techniques |
| | | less emphasis on hunter-gatherer techniques |
| | | India, Sri Lanka, Malaysia, Indonesia) coastline, Australia |

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| KYA | other references | Event |
|------------|-------------------------|--|
| 50-35 | | eventually coastal China including Formosa/Taiwan, southern China; also Mongolia |
| 45 | M168 to M89 | second (and last) H. Sapiens migration from Africa to Mid-East migration ended due to expansion of Sahara |
| after 45 | | deteriorating conditions ended migration routes |
| 40 | M89 to M9 | Mid-East to Iran migration - hunter-gatherer culture |
| | | colder than today |
| 40-20 | | Sahara driest |
| 35 | M9 to M45 | migration from northern Iran to central Asian steppes |
| | | steppes from Gulf of Aqaba to northern Iran, Central Asia - following game |
| 35-30 | M9 to M20 | migration from northern Iran to India |
| | | M20 men took M130 wives, driving away / killing M130 males |
| 35-30 | M45 to M173 | migration from Asian steppes to westward to Europe |
| 35-32 | M173 | cave art in Italy, France |
| | | abrupt change of skills vs. previous similarity to Neanderthals, others |
| 30-25 | | last H. Neanderthals |
| | | no sites of battles, butchery |
| | | H. Neanderthals brute force vs. H. Sapiens innovation |
| | | H. Neanderthal dispersed culture vs. H. Sapiens complex culture |
| | | H. Sapiens reliance on teaching, learning (vs. instinct in H. Neanderthals?) |
| | M173 | H. Sapiens adapted to Steppes hunting |
| 20 | M45 to M242 | migration from Asian steppes eastward across southern Siberia, Mongolia |
| | | H. Sapiens first (and only) hominid to learn how to adapt to extreme cold (-50°C / -58°F) / harsh environments |
| | | also into northern China |
| 35 | | M130 met incoming M242 in China (note time discrepancy) |
| 20 | | Ice Age glacial maximum |
| | | lowest sea levels (due to Ice Age) |
| 20-12 | M242 to M3 | first migration from northern Siberia to Americas |
| | | using Siberia-Alaska land bridge – isthmus |
| | | only possible due to adaption to extreme cold |
| | | hunters of large mammals (mammoths, walrus, seals) (Grizzly bear, other animals also migrating) |
| | | same "Microlith" arrowheads Siberia, Americas |
| | | finely-crafted microlith tools, portable dwellings, clothing to withstand cold |
| | | "Amerind" languages |

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|------------|-------------------------|---|
| 15 | | Glaciers begin to melt |
| | | allows access from far-north southward to American plains - buffalo |
| 14 | Americas migration | Meadowcroft, Pennsylvania |
| 13 | | Monte Verde, Chile |
| 11 | | Clovis, New Mexico |
| | 1,000 years | to reach southern tip of South America |
| 13 | M89 - Levant | Agriculture / farming, villages / cities, complex social organization in Levant – world's first |
| | | prior: hunter-gatherers (universally) |
| | | start of "Neolithic" period of Stone Age |
| 12.97 | 10,950 BC | comet fragments impact in Austria and North America during Wisconsin glaciation; see Gobekli Tepe carving |
| | | effect on transition from hunter-gatherers to agriculture |
| | | https://www.telegraph.co.uk/science/2017/04/21/ancient-stone-carvings-confirm-comet-struck-earth-10950bc-wiping/ |
| | | see also "Clovis culture demise", "Clovis comet", "Younger Dryas impact" and https://www.sciencedaily.com/releases/2012/09/120918111320.htm |
| | 1,300 years | Duration of resultant period of cooling |
| 10 | M173 to M17 | migration from Poland area to area north of Caspian Sea, Ural Sea |
| 10 | M89 to M172 | migration from Mid-East westward along Mediterranean coast - Greece, Italy, Iberia |
| | | affected by meteor impact's climate change? |
| | | introduced agriculture to hunter-gatherer Europeans M173 |
| 10 | M9 to M175 | migration from Iran to Southeast Asia |
| 10 | M175 to M122 | migration from Southeast Asia to southern China |
| | | pushing out coastal M130 populations |
| 10 | M130 | second migration from Asia to North America |
| | | coastal by boat, not overland |
| | | "Na-Dene" languages - western Canada, southwest U.S. - Navajo |
| 10 | started 50 kya | H. Sapiens on every continent except Antarctica |
| 9 | 7,000 BC | agriculture - millet - northern China |
| 7 | 5,000 BC | agriculture - rice - southern China |
| 7 | -6 kya? | Sumerians migrate into Mesopotamia (Iraq / west Iran); M45s? |
| 5.5 | 3500 BC | agriculture in M130 Taiwan |
| 5.4-5.3 | Sumer | first writing - end of Mesopotamia's "prehistoric" era; world's beginning of "historic" era |
| 5.0 | Egypt | writing (derived from / influenced by Sumerian) |
| 5-3 | M130 | migrations from Taiwan to islands of Philippines, Indonesia |

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|------------|-------------------------|---|
| 5 | | copper smelting (end of Stone Age after 3.4 million years) |
| 4 | 2,000 BC | agriculture - taro root in M130 Borneo, Sumatra |
| | | agriculture required for island-hopping Polynesians |
| | | hunter-gatherer culture cannot island-hop |
| 4 | China | writing (independent?) |
| 4 | Mid-East | Bronze Age |
| 4 | M242 | Aleut-Eskimos from Siberia to Canada, Greenland |
| 3 | Greece Levant | Iron Age |
| 4-3.1 | | influx of pre-Greeks (Ionians, Aeolians, Dorian) to Greek peninsula |
| 3 | M130 | migration to Polynesia |
| 2.8 | | Greeks adopt Phoenician alphabet, adding vowels - to record Homer's <i>Iliad</i> and <i>Odyssey</i> ? |
| 2.8-2.3 | | Classical Greece era - Athens democracy - first non-strong-man rule |
| after 2.8 | | Greek colonies in Italy influenced Roman culture |
| after 2.7 | | influence of Greece (via Roman Republic and Empire, Christianity) on Europe |
| 2.6-2.05 | 605 BC – 49 BC | Roman Republic; Senate - non-strong-man rule |
| 2.35 | ~350 BC | first water wheel |
| 2.34 | 338 BC | conquest of Greece by Phillip II of Macedon - end of Athens democracy Error! Bookmark not defined. |
| | 88 BC | first civil war in Roman Republic |
| | | Marius introduced soldiers loyal not to the Republic but to their commanders |
| 2.3 | Meso-America | writing (independently; no Old World - New World contact) |
| 2.1 | 82 BC | Sulla dictator (strong-man rule) of Rome permanently destabilized Roman politics and set the precedent for subsequent rulers |
| 2.07 | 49 BC - 44 BC | Julius Caesar dictator (strong-man rule) of Rome |
| 2.05 | 31 BC | last civil war of the Roman Republic – battle of Actium |
| 2.04 | 27 BC | first Roman Emperor - permanent return of strong-man rule |
| 2 | | introduction of Christian ethics |
| 1.6-0.2 | ~400 AD-1797 | Republic of Venice - longest-lived country in history; trade-based no strong-man rule, no revolts, no invasions until Napoleon |
| 1.6 | 410 AD | first sack of city of Rome since 310 BC |
| 1.5 | 476 AD | end of Western Roman Empire |
| 1 | 1025-1120 AD | migration to Hawaii |
| 1.1 | 900 AD | migration to Easter Island |
| 0.5 | 500 AD | Hawaii estuaries and fishponds constructed? as early as 124 AD? |
| | | DNA shows Andes sweet potato in Hawaii ca. 1100, showing (Polynesian?) contact with South Americans |

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|-------------|-------------------------|---|
| 1.2 | 1205 sack | decline of Eastern Roman Empire / Byzantine Empire |
| 0.8-1.2 | 786-1258 | end of short Islamic Renaissance |
| | 1205 | Magna Carta in England first "Rights" (of nobles) |
| 0.54 | 1483 AD | End of Eastern Roman Empire / Byzantine Empire |
| 0.4-0.25 | 1607-1776 | British American colonial period |
| 0.25 | | Start of Industrial Revolution – Scotland, England |
| 0.25 | 1789 - present | American republic with constitutionally -defined and limited government non-strong-man rule |
| | | constitutionally-protected rights |
| | | first classless, non-nobility culture |
| 0.15 | 1865 | end of legal slavery in America |
| present-day | | oppression in some form (imposed govt, social classes, castes, slavery) world-wide except in America |

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