

# Human Origins and Humanity's Future: Past, Present, and Future of the Anthropocene

## Glossary

**Agriculture:** A subsistence strategy that relies on **domesticated** species and is in contrast to **hunting and gathering**.

**Agricultural revolution:** The transition from **hunting and gathering** to settled **agriculture** starting ~12,000 years ago in Mesopotamia. The development of and transition to agrarian life ways and technology was piecemeal in different places and at different times instead of a full blown "revolution".

**Anthropocene:** The proposed geologic epoch defined by human influence on the Earth. There is yet to be consensus for when the anthropocene began with suggestions ranging from the start of the agricultural revolution to the first atomic explosion.

**Bacteria:** A type of prokaryotic microorganism. Unlike eukaryotes, bacterial cells do not contain a nucleus and rarely harbour membrane-bound organelles. Bacteria were among the first life forms to evolve on Earth, and can be found in most every habitat, including soil, water, acidic hot springs, radioactive waste, the deep biosphere of the earth's crust, and in and on other living organisms as symbionts and parasites. Bacteria can be beneficial, such as those comprising the gut flora, or pathogenic and cause infectious disease. However, the vast majority of the bacteria in the body are rendered harmless by the protective effects of the immune system.

**Climate change:** Long-term shifts in temperatures and weather patterns induced by natural phenomena or human activity.

**Cooperative breeding:** A social system in which parents and other individuals within the group provide care for offspring.

**COVID-19:** An **infectious** disease caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) that was first identified in December 2019 in Wuhan, China, and then spread globally, resulting in a **pandemic**. Common symptoms include fever, cough, fatigue, shortness of breath, loss of appetite, sputum production, and muscle and joint pains, and loss of smell and taste. Severe cases may progress to acute respiratory distress syndrome (ARDS), multi-organ failure, septic shock, and blood clots. Spread of the virus occurs between people during close contact, most often via small droplets produced by coughing, sneezing, and talking. Less commonly, people may become infected by touching a contaminated surface and then touching their face

**Domestication:** The process of artificial selection by humans for desired traits of plants, animals, fungi, and microorganisms.

**Epidemic:** The rapid spread of a disease to a significant percent of a given population.

**Foraging:** Searching for wild food or provisions as opposed to cultivating food crops or breeding livestock.

**Grandmother hypothesis:** An explanation of the post-menopausal life stage of human females whereby the existence of grandmothers serves as a biological and social adaptive advantage for humans. Post-reproductive life stages are non-existent among non-human primates, so it is hypothesized that humans evolved to have grandmothers and grandmothers to have individuals who are free to invest their energy into the offspring of their children. This off-loads the

reproductive cost of parenting through social kin-networking, and off-set the resource cost of brain- building as parents are freed to provision resources. Increased resource procurement may reduce the **inter-birth interval** by allowing for earlier weaning, which in turn increases offspring production potential, passes down generational knowledge, and increase social networks. In doing so, the grandmother ensures the survival of her genes in subsequent generations. The extended post-reproduction life stage of grandmothers likely had the added output of producing grandfathers, who also provide benefits to the extended family, as well as their own extended reproductive time line that competes with subsequent generations.

**Greenhouse effect:** The entrapment of heat close to Earth's surface by **greenhouse gases**.

**Greenhouse gas emissions:** The release of polluting gasses resulting from human activity, such as burning fossil fuels that contribute to **greenhouse effect**.

**Grey ceiling effect:** The proposed boundary of maximum brain size in hominins that can be supported by an ape-like lifestyle that was crossed by genus *Homo* through the adoption of cooperative breeding. Described by Isler and van Schaik (2011).

**Hominin:** A classification of **species** comprising humans and our extinct relatives following the split with the common ancestor with chimpanzees.

**Homo sapiens:** The **hominin** species comprising all living humans. Meaning "wise man" in Latin, the name was introduced by Carl Linnaeus in 1758. The earliest fossil evidence of *Homo sapiens* appears in Africa around 300 kya (see *Jebel Irhoud Hominins*).

**Hunting and gathering:** A subsistence strategy in which most or all food is obtained by **foraging** and is in contrast to **agriculture**, which rely mainly on domesticated species.

**Industrial revolution:** The transition from agrarian and handcraft manufacture of goods to large scale industrial production starting 1760 in Great Britain and the United States.

**Invasive species:** A non-indigenous organism that can destabilize ecosystems when introduced.

**Inter-birth intervals:** The time span between live births.

**Mass extinction:** The widespread and rapid loss of biodiversity.

**Pandemic:** An **epidemic** that has spread across regions, including multiple continents or worldwide.

**Species:** A biological population whose individuals can mate with one another to produce viable and fertile offspring. This is a debated definition and the concept is problematic for extinct fossil organisms for which DNA is not available.

**Virus:** A submicroscopic infectious agent 10 million times smaller than a human that relies on a living host cell for metabolic processes and replication. Like living organisms, viruses possess genes and evolve by natural selection. Unlike living organisms, viruses lack cellular structure, do not have their own metabolism, instead relying on a living host cell for production of materials, and replication through self-assembly inside a host cell.