Lessons from Australia's rabbit plague

by Jonathan Sarfati

Rabbits might seem cute, but in Australia, they are a major pest. Australia has about 200 million rabbits, which cost about Au$200 million per year in agricultural damage.

In 2022, Francis Jiggins, a geneticist at the University of Cambridge, and his team investigated the genetics of a representative sample from around Australia. They could all be traced from a shipment of 24 rabbits that arrived from England to Melbourne, Australia, on 25 December 1859 (the year Darwin published *Origin of Species*).[1] This Christmas gift to wealthy English settler Thomas Austin proved to be the proverbial coal in the stocking for Australia as a whole.[2]

One village-atheist argument against the biblical Flood/Dispersion account is, 'How could a rabbit hop all the way across the world?' Well, 'how did a rabbit hop all the way from Melbourne to Australia's west coast?'

These were hardly the first rabbits to be introduced to Australia. Five came with the 'First Fleet', the 11 British ships that brought the first settlers (and convicts) to Australia, landing on 18–20 Jan 1788. There were about 90 other attempted rabbit introductions between them and the Austin shipment.

Why didn't the other rabbits leave more descendants? Two main reasons. First, the earlier ones were mostly domesticated, too tame to survive in the new environment. The Austin shipment had a lot of healthier wild ancestry. Second, the harsh Australian environment was partly tamed. Settlers had turned some of the outback into pasture and had hunted many predators, such as dingos.

The Australian rabbit has lessons relevant to true world history revealed in the Bible.

Exponential growth

CMI speakers are often asked: how could we get so many people in such a short time since the Ark landed (about 4,500 years)? Similarly, how could we have so many land vertebrates today if most came from a pair on the Ark (seven pairs for 'clean' animals)?

The answer is *exponential growth.* A quantity increases by a certain amount per generation or given time interval, leading to faster growth with increasing quantity. E.g., if a population doubles every generation, and we start from two, the next generation will have four, then eight, then 16. After only ten generations, there will be 1,024 (2^{10}), and after 20, 1,048,576 (2^{20}). This is an important principle for population studies, as well as compound interest and inflation. Radioactive elements undergo *exponential decay,* halving the initial amounts for every half-life.

Some mathematics

Exponential growth is expressed as $N(t) = N_0e^{rt}$. Exponential decay is the same thing with a negative: $N(t) = N_0e^{-rt}$. The superscript is called the *exponent*, which explains the meaning: r is the growth or decay rate, N(t) = number at time t, N_0 is the initial number, and e is Euler's number (≈2.718). (This was named after the great creationist mathematician Leonhard Euler (1717–1783); see creation.com/euler.)

For a rule of thumb for calculating in your head, use the 'Rule of 72'. That is, divide the percentage growth rate, r, into 72. E.g., if your investment earns 8% compounded every year, then it will double in 9 years ($^{72}/_{8}$). For the rabbit population, with continuous population growth, the formula is: doubling time = $^{100 \ln 2}/_{r}$, where ln2 is the natural logarithm of 2 (0.693). Thus a rule of 69 would be more precise, but 72 was historically chosen because more numbers divide evenly into it.

Even with slower population growth rates, populations will double every so often. Thus they can become large much more quickly than expected. This explains the rapid human population growth after the Flood.[3] Even a pair of the elephant kind from the Ark could have 8 million descendants in only 550 years.[4]

When it comes to rabbits, exponential growth was soon obvious. Only three years after the 1859 Austin shipment, there were already thousands of rabbits. Another three years later, Austin bragged to the paper that he had killed 20,000 rabbits. But by then, many more had escaped his land.

Overpopulation doom-mongers' blunders

Just before Darwin, English clergyman and economist Thomas Robert Malthus (1766–1834) advocated checks on population growth. He argued that population increases geometrically, i.e., exponentially, while food increases only arithmetically (e.g., 1,2,3, … 10 … etc.). So after lots of population doublings, there would be a catastrophic imbalance between the number of people and the amount of food.[5,6]

Various population doom-mongers such as Paul Ralph Ehrlich (b. 1932) thus advocated coercive population control measures such as abortion. Eric Pianka (1937–2022) was applauded when he supported a virus that would exterminate 90% of the world's population.[7]

Max Roser based on World Bank and Bourguignon and Morrisson (2002), Wikimedia Commons

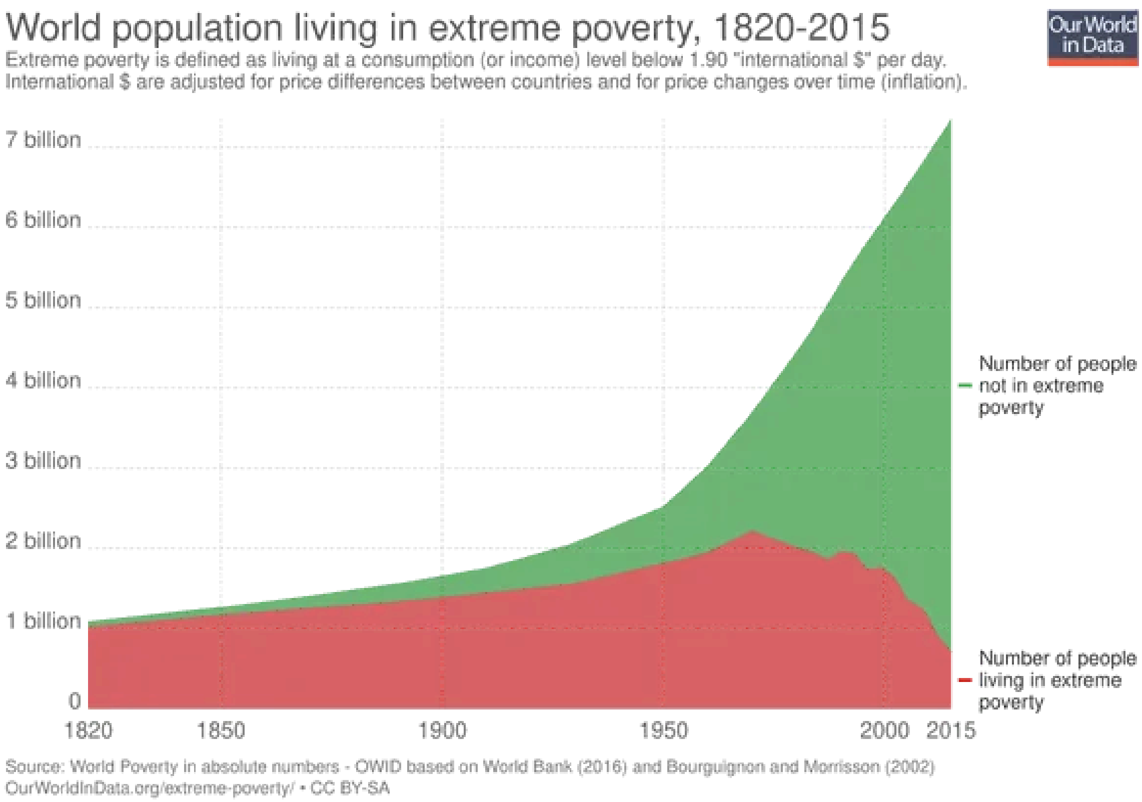

Figure 1. As world population has skyrocketed, extreme poverty has plummeted, contrary to over-population scaremongering.

But in reality, the world's population has skyrocketed in the last few decades, to over 8 billion. But the numbers in extreme poverty have plummeted—in absolute numbers, not just relative to the larger population (see Figure 1, right side). Furthermore, Malthus' starting premise was wrong. Our food is mainly composed of living creatures, which can also grow exponentially.

Another problem is that the Belgian mathematician Pierre Verhulst (1804–1849) read Malthus and proved that he was mistaken. Real populations will eventually limit themselves. They will follow the *logistic function,* i.e. an S-shaped *(sigmoid)* growth. So even the Aussie rabbits will reach a limit. The same was true for the human population in Malthus' time (see graph, left side).

Only recently has the population skyrocketed. It wasn't because people started 'breeding like Australian rabbits.' Rather, babies and children stopped dying like flies to diseases now preventable by vaccines and sanitation. Also, scientists developed new ways of increasing food yields. Ehrlich and Pianka essentially taught that more people just means more mouths to feed. But in reality, more people mean more brains to invent things, more hands to work, and more hearts to love.[8]

Spreading over large areas

By 1890, only three decades after their release, the Austin rabbits' descendants had covered an area of over 1 million km^2 (400,000 square miles). Two decades later, the rabbits' descendants had reached the coast of Western Australia, right across the continent.[9]

One village-atheist argument against the biblical Flood/Dispersion account is, 'How could a rabbit hop all the way across the world?' The answer is one rabbit didn't need to. It would have happened over several generations. One might just as well say, 'how did a rabbit hop all the way from Melbourne to Australia's west coast?'

For animals reaching Australia from the Ararat mountains, some could have travelled with humans, like the rabbit. Also, the Genesis Flood caused a single Ice Age, which transferred warm ocean water (via evaporation, clouds, and snow) to massive ice sheets on land. This means ocean levels were lower, so land bridges were exposed. In particular, almost all of the route from Ararat to Australia was land. Furthermore, the Australian continent (unlike New Zealand's South Island) and the route did *not* have ice sheets. When the Ice Age ended after about 700 years, the sea levels rose to cover the route and isolate Australia.[10]

What about inbreeding?

Many biblioskeptics argue that the human population coming from just Adam and Eve would be horribly inbred. The same goes for land vertebrates coming from one pair per kind on the Ark. In general, the issue is a *population bottleneck*. The term 'bottleneck' refers to a graph of the population size that is originally wide with many people, then narrowing sharply like the neck of a bottle.

However, the very small population of 24 rabbits has clearly left a thriving population of hundreds of millions of descendants. In fact, 10 years before the 2022 study,[1] CMI used the Australian rabbits to show that small populations are not *necessarily* a bad starting point.[11] In fact, the Chatham Island Black Robin population was brought back from near extinction with just a single breeding pair![12] There are two main concepts to understand.

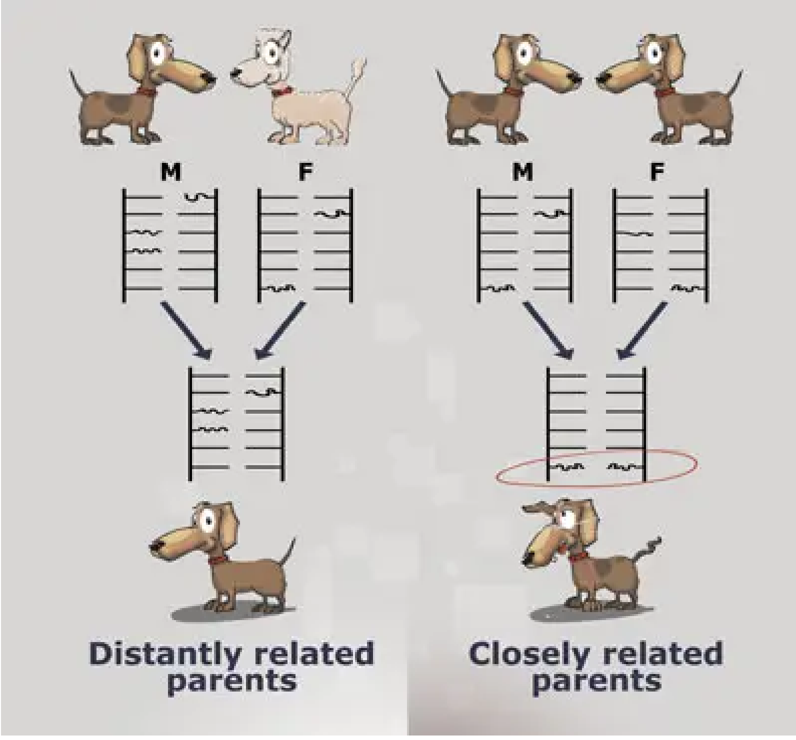

Figure 2. Inbreeding depression in a mutated population. **Left:** for every mutation inherited from one parent, the other distantly related parent has the backup copy. Thus its harms are mitigated or eliminated. **Right:** the offspring can inherit the same mutation from closely related parents. Thus the offspring will express the harmful change.

1. Why is inbreeding often bad?

God designed sexual reproduction partly to increase genetic diversity, and also to shield us from the effect of harmful mutations. Both parents pass on half of their genes to each child. Thus all children have about half their DNA from the mother and half from the father. Because we live over 6,000 years after the Fall, from sin, we all have lots of harmful mutations. But if a couple is not closely related, they will usually have different mutations. So when one spouse passes on a broken gene, the other spouse provides the 'backup copy'. Thus the effects of the mutation are lessened or even eliminated for the child. But if the couple is closely related, they will sometimes pass on the same mutation. Then the child will suffer its bad effects (and the same is true of animals, e.g. purebred dogs—see Figure 2).[13] This harm is called *inbreeding depression*.

Inbreeding depression is a non-issue without harmful mutations—such as offspring of creatures created "very good" in Creation Week.

The key point is **inbreeding depression is a non-issue without harmful mutations.** E.g., Adam and Eve had lots of sons and daughters (Genesis 5:4), thus brothers married their sisters. But since they were one generation from the "very good" original (Genesis 1:31), there were hardly any harmful mutations. So there was no *inbreeding depression*.

The same was likely true of the Ark animals. After all, God selected and brought the animals to Noah (Genesis 6:20), so He likely chose specimens with few mutations.

We have a biblical clue about when inbreeding depression started becoming a problem, at least for humans. It was probably not even a problem by the time of Abraham, c. 2000 BC. He married his half-sister Sarah (Genesis 20:12). God clearly blessed this marriage because the Abrahamic Covenant of Genesis 12:3 was fulfilled through Sarah, not through his two other wives. Abraham and Sarah became the ancestors of the thriving Jewish/Israelite nation. This is the people through whom both Scripture was written (Romans 3:2) and the Messiah came. Rather, only in the time of Moses (c. 1450 BC) did God impose a new law for our protection against marrying close relatives (Leviticus 18:6–18).[14]

2. Recovery from a *short* bottleneck

But the Australian rabbits and Chatham Island Black Robin were long after Leviticus. So wouldn't they have lots of mutations? For sure! One reason to use these examples was an *a fortiori* (how much more) argument to support Scripture.[15] That is, since even highly mutated small populations can sometimes quickly expand, *how much more* can the initial human population and the Ark animals' descendants?

The answer is that population geneticists have long known that inbreeding depression is not such a problem if the bottleneck is short.

But why could these small populations expand despite inbreeding depression? The answer is that population geneticists have long known that it's not such a problem if the bottleneck is *short*. As the population expands rapidly, there are many descendants. That means enough will survive that don't have two mutations in one spot. Those suffering from that problem will be eliminated by natural selection—a process discovered by creationists before Darwin—that removes less fit specimens.[16] Thus bottlenecks on the biblical timescale are not too bad. Thus, even the eight people who survived the Flood would probably have retained about 75% of the human genetic diversity.[17]

However, the main evolutionary theory for early humanity, the 'Out of Africa' model, postulates an African bottleneck. In this bottleneck, *Homo erectus* evolved into *Homo sapiens*. (CMI thinks both are varieties of humans, descendants of Adam and Eve.)

Evolutionists were surprised to find that humans have relatively low genetic diversity—something predicted from our descent from just eight on the Ark (1 Peter 3:20). So evolutionists explained the low diversity by a bottleneck of about 10,000 people for maybe 10,000 years or more—with their larger population, they have to extend the timeframe.

However, such a long bottleneck would have been terrible for the human population. The inbreeding depression probably would have made us extinct.[18]

Summary

- Australian rabbits are a good example of exponential population growth—just like human and animal populations after the Flood.
- Australian rabbits show how populations can spread out over huge areas over many generations —just like after the Flood.
- Australian rabbits show that small populations don't always become extinct through inbreeding— as long as the population grows quickly.

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