

# the End of Evolution

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For the past 4.3 billion years, life has evolved on Earth according to the principles of evolution (random genetic variation, survival of the fittest) first detailed by Charles Darwin and Alfred Russel Wallace, with some refinements due to more recent biologists. These principles tend to improve the various aspects and functions of the individuals in each species, at least in a reproductive or survival sense. But not always. Some members of a species of fish may find themselves trapped in a cave. They may thrive, and produce new generations of fish. But their eyes are not useful in the dark, so natural selection does not select better vision, and the vision of subsequent generations of the species gets worse. Bats found caves to be good places to hang out, they developed sonar, and their eyes became less important, and the vision of subsequent generations got worse.

Human evolution has produced us. Human evolution continues, although the pace of evolution is too slow to be observed by any individual. We are not “perfect”; we are not an end-product. Our environment changes, and those changes may put evolutionary pressure on us to adapt. But there are recent developments that may radically affect the course of our evolution, and may even put an end to our evolution.

When the human population first spread out across Earth's continents from one to two million years ago, the various geographic groups began to evolve separately, and that's how the different human races were formed. These human races were on their way to becoming distinct species, just as the hominid population ten million years ago split into the apes, the gorillas, the monkeys, the orangutans, the chimpanzees, the bonobos, and the humans. But the speciation of humans has been halted because humans now travel a lot, and the races have mixed together. Interracial reproduction used to be socially and religiously and even legally unacceptable, but it is now perfectly acceptable in most of the world, and is becoming more frequent.

The same thing has happened to language, at a much faster pace. Two thousand years ago, Latin was spoken all over the Roman Empire. The various geographic groups began to evolve their languages separately, first into dialects of Latin, and then into the separate languages of Italian, French, Spanish, Portuguese, Romanian, and Romansh. The various English dialects of Yorkshire, Scottish, Irish, American, Australian, South African, Jamaican, and so on, have different accents, and different vocabulary, and they were on their way to becoming distinct languages. But modern communications have put a halt to that. Now, when an English language movie is made in one place, it is shown all over the English speaking world. Now, when a new word pops up in one place, within a few days it is heard all over the English speaking world. The English speakers have to know the variety of their language, not just their own dialect, and that stops language speciation.

Modern medicine can heal the sick. Since smallpox and polio have been eradicated, immunity to these diseases is no longer a survival advantage. A whole array of diseases can be treated (cured or controlled) by modern medicines and vaccines, so those diseases no longer put evolutionary pressure on us.

Modern surgery can replace faulty body parts. A genetically weak heart and genetically bad lungs don't have to limit one's reproductive abilities, nor diminish one's nurturing abilities.

Modern society has developed laws and law enforcement that prevent the strong among us from victimizing the weak among us. In time, this will have a profound effect on our evolution. Strength, speed, and agility are no longer so important to survival.

Even cleverness is no longer a reproductive or survival advantage. As our civilization and society advances, we care for those who cannot care for themselves, with social services and support.

Modern medicine, laws, and social services are at most a few hundred years old, which is generally not long enough to observe evolutionary consequences. But there is one modern development whose effect has been so dramatic that I think it can be seen and measured: eye glasses. In 700 years they have gone from nonexistent to 60% of people wearing glasses. I don't know if there are reliable data to say whether human eyesight has deteriorated in that time, but I think it is probable. Other prosthetics, such as hearing aids, may have the same effect in future.

There is one more modern invention that could quickly change everything: genetic engineering. It can, if we allow it, change genetics in any direction we choose. Someone might say that genetic engineering is not the end of evolution, but just a change in the course of evolution. It is certainly not Darwin's evolution. It seems possible that evolution as we know it will end, and be replaced by genetic engineering. We will design our successors.

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