

Paul Kammerer was born in Vienna on August 17, 1880. When he reached adulthood, he enrolled in the Vienna Academy to study music. The piano was his instrument of choice. Yet, somehow, he ended up graduating from the university with a degree in biology.



Almost all of Kammerer's experiments involved forcing various amphibians to breed in environments that were radically different from their native habitat.

In his first series of experiments, he dealt with two different types of salamanders. The first, the black *Salamandra atra*, lived in the Alps and gave birth on land to two large, fully formed babies. The second, the spotted *Salamandra maculosa*, inhabited the lowlands and gave birth to ten to fifty larvae in water. These larvae had tadpole attributes and would eventually metamorphose into salamanders.

Kammerer forced each salamander to live and breed in opposing environments. The spotted valley salamander, raised in the cold and dry Alpine environment, eventually gave birth to two fully developed salamanders (there were several abortive litters of tadpoles prior to this success). The black Alpine salamander, raised in the hot and moist lowland climate, eventually gave birth to tadpoles in water. With each litter, the Alpine salamander gave birth to a greater number of tadpoles.

The next step was to take these offspring, born under abnormal conditions, and raise them to adulthood. Kammerer then attempted to breed them and found that they all showed (to varying degrees) the same reversal of reproductive method as the parents.

I know what you're thinking. That's nice, but it's no big, fat, hairy deal.

Well, it was a big deal to Kammerer and many other members of the science community. Kammerer claimed that these experiments demonstrated Lamarckian inheritance.

Lamarckian what?

Lamarckian inheritance. This is the idea that what one acquires during one's lifetime is passed on to that person's offspring. If you play guitar all day long, then your children will have nimble fingers. If you lift heavy weights all of the time, then your offspring will have larger muscles. Each generation builds upon the past and continues to

improve. Sounds a bit bizarre, but just remember that at one time you could be killed for suggesting that the Earth revolves around the Sun.

Are you still pondering that thought that this is no big, fat, hairy deal? Well, just think of the ultimate consequence: If Lamarkian inheritance can be proven, then we can easily develop a race of super human beings.

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Kammerer was studying yet another amphibian, the midwife toad, *Alytes obstetricians*. It is called the midwife toad because when mating occurs, the male carries the fertilized eggs around his hind legs until they hatch. Unlike most other toads and frogs that mate in water, the midwife toad breeds on dry land.

You can see where this is going...

Kammerer decided to force the midwife toad to copulate in water. He was able to breed six generations of the toad until the lineage died out.

Even more surprising was that the midwife toad had developed *nuptial pads*. Nuptial pads are black calluses containing very minute spikes that develop on the male during mating season. This allows the male to hold on tight while breeding takes place in the slippery water. Since the midwife toad breeds on dry land, it does not need or possess these pads.

With each generation, the nuptial pads became more prevalent. Kammerer suggested that, once again, this provided evidence that inheritance of acquired characteristics had taken place.

Almost instantly Kammerer found himself in the middle of a worldwide controversy. Many scientists sided with him, while others thought that his findings were ludicrous.

At the same time, Kammerer found himself in a bind. World War I had devastated his Austrian homeland and the onset of the great depression had left him very poor. He was forced to abandon his research and preserved his last few specimens in jars of alcohol.

As a result of the lack of funding, Kammerer was forced to step down from his university position and embark on the profitable lecture circuit. One of his stops was at Cambridge in England in 1923. He brought with him his last remaining specimen of the midwife toad (the rest were lost during the war) - a fifth generation male. A large number of scientists attending the conference examined this specimen. The nuptial pad was clearly visible (the other had been removed to prepare biological sections), and no one questioned its authenticity.

So far, so good.

Kammerer continued to tour the United States in an effort to earn money. He was a sensation. Newspapers exaggerated his claims, and he created ever increasing sensation.

That was until August 7, 1926. On this date, an article appeared in the British journal *Nature*. The author, Dr. G. K. Noble, Curator of Reptiles at the American Museum of Natural History, claimed that the nuptial pads on the midwife frog were faked. They were, with almost complete certainty, India ink! The nuptial spines could not be located, either.

Shortly thereafter, on September 23, 1926, Kammerer took a walk in the Theresien hills of Austria and chose to end it all. He put a bullet through his head.