Second Reflection:
Becoming The Creator of Life

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For today's reflection I wanted to talk about Theo Jansen a phenomenal artist and engineer whose work has absolutely blown my mind. I have never been such in awe in front of an artwork than when I saw his creatures. So in brief, Mr. Jansen decided in 1990 to replicate evolution by creating a new form of life called "the Strandbeest". Over the years, he kept adjusting his models and improving it, bit by bit, sometimes reusing mechanisms from older creatures to create the new one. By doing this, he was indeed recreating the concept of natural selection. He made creatures, saw their flaws, kept all the parts and muscles that worked in his creature, dissembled the rest and created a new life form based on his adjustment. And over 10, 20 years of this, he ended up with machines that can walk on their own (with a bit of the wind's help), retain energy, have reflexes and nerves systems that allows them to take decisions based on their environments and, as his last specimen shows it, even fly. It is fascinating to see how he recreated the evolution of a life-form with mechanics and calculations. As Theo Jansen says himself: "By developing this evolution, I hope to become wiser in the understanding of existing nature by encountering myself the problems of the real Creator". I think this is a powerful because as you go through his body of works you realize that that is exactly what he did, becoming the Creator itself by replicating life. It goes further beyond the concept of artificial intelligence or consciousness as his works focus more on the physical aspect of life and how the theory of the survival of the fittest can concretely be applied to make a body adapt to its environment, so that it can live in such a harsh climate. It is also important to note that all his machines operate or "live" on the beach, adding a level of difficulty to his craft as sand can easily clog joints and make the whole construction fail.

As his work is all interconnected, it was difficult to find a specific creature or "period of creatures (as they are all separated by periods of evolution) to focus on. That is why I decided to focus on the components he added, which defined each periods of his work (first he added legs, then muscles, then nerve cells, etc). After much reflection, I decided to expand on the beginning of all, the "legs" of his specimens, because the way he used programming to find the perfect proportions of the legs is fascinating. So to explain briefly, each of his creature contains a backbone and all the legs are attached to it by a joint that moves in a circular motion. And when each of these joints would move, the whole leg would move around and it's tip (we can think of it as the foot) would follow a specific curved based on the proportions of the tubes that constructs the leg. And

1. Theo Jansen, *Strandbeest*, accessed April 10, 2025, https://www.strandbeest.com/.

to construct the perfect leg, Mr. Jansen needed to find a the perfect proportions of length for each tube that would create a foot that follows a curve with a flat bottom. So here are all the attempts he had to make in order to find it. Firstly, he created an ATARI computer program who generated hundreds of thousands of curves with a given proportions of leg. But this created way too many possibilities and it would have taken the program approximately a hundred thousand years to find the perfect match, which is ridiculous. So he instead secondly relied on the theory of evolution to find a suitable solution by keeping only the most appropriate proportions of each tube (that created the legs) and allowing the program to render new generations and possibilities using the “fittest” length of tubes determined in the previous rendering. That way he was able, by letting the program run without stopping for month, to find the perfect length of each of the tubes that created the leg so that it creates a curve with a flat bottom, allowing his creatures to move forward. Isn’t that fascinating?! He created a program and then applied a Nature Law (evolution) to his program to be able to find the best solution a million times faster than it would have taken the regular program to do. As a prior student in biology, I am fascinated by the correlation between Programming, Engineering and Biology that Theo Jansen creates, which I did not even knew existed before discovering his work!

Bibliography

Jansen, Theo. *Strandbeest*. Accessed April 10, 2025. https://www.strandbeest.com/.