Second Reflection:
Becoming The Creator of Life

Simon Duchaine Morneau 40319302

Concordia University

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Sabine Rosenberg

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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 buy plastic tubes and replicate evolution by creating a new form of life called "the Strandbeest" with them. 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 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."[1] I think this is a powerful quote because, as you go through his body of works, you realize that it is exactly what he did, becoming the Creator 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. 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 is difficult to find a specific creature or "period" of creatures (because all of his specimens are separated by periods of evolution) to focus on. That is why I'm going to focus on the components he added, which defined each periods of his work (first he added legs, then muscles, then nerve cells, etc.). More specifically, I will expand on the beginning of all, the creation of the "legs" of his specimens. I choose to talk about them because the way he used programming to find the accurate legs' proportions is fascinating. In short, each of his creatures 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 move, the whole leg move around and it's tip (we can think of it as the foot) follows a specific curved based on the proportions of the tubes that

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

construct the leg. So in order to construct the perfect leg, Mr. Jansen needed to find the perfect proportions of length for each tube that would allow the foot to follow a curve with a flat bottom (in order for the creature to move consistently on a flat surface). So firstly, he created an ATARI computer program that generated hundreds of thousands of curves with a given proportions of leg. But this method created way too many possibilities. It created so many in fact that 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 possibilities using the "fittest" length of tubes determined in the previous rendering. We can imagine it as if the program took the fittest babies of each render and reproduced them to find the perfect genes. Doing it that way and by letting the program run without stopping for month, Mr. Jansen was able to find the perfect length of each of the tubes that created the legs of his creatures, which allowed them to walk properly. Isn't that fascinating?! He created a program and then applied a Nature's Theory (evolution) to it to be able to find the best solution a million times faster than if he let the program running on his own. 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! Fabulous stuff, I am still in awe by the genius of this man.

Bibliography

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