

## Deep Matter

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[See table of contents](#)

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54

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CASSOU-NOGUÈS

—  
DEEP MATTER



*A text written at the artist's request for an upcoming work on gray goo and 3D printing.*

—  
Ladies and Gentlemen,

My name is Norbert Wiener. I was born in 1894 in Columbia, Missouri. I grew up in Cambridge, Massachusetts. My father, Leo Wiener, was professor of Slavic Literature at Harvard University. He took care of my education. I became a child prodigy. I finished high school at 11, graduated from college at 14. I wrote a book about my childhood. I wanted to show people what kind of monster a child prodigy was.

## **I WAS A MONSTER**

I was my father's creature, a Frankenstein if you wish. Maybe that is why I began to think about machines. Or maybe not. They were various reasons, I guess.

I wanted to have my own creature: a doll that I would animate by singing secret incantations, or a robot, or a golem. Whatever. It would be mine. My own monster. It would follow me everywhere. It would work by itself when I was busy. It would build things.

I had a machine once. I called it

## **"PALOMILLA"**

It is Spanish. It means moth. It was a small cart with wheels. It could detect light, and, depending on the position of a certain switch, it would follow the light or shun from it, looking for the darkest corner of the room. We were on television, Palomilla and I. We played in a theatre show as well. I had a flashlight. The mechanical bug, attracted by the light, followed me on stage.

With my assistants, we build a another bug and we attached a light on both their backs. We set them running in the room. They were attracted by each other, because of the light each carried on its back. It looked like

they would mate. But then we put the switch in the other position, and they ran away from each other. They made strange dances as if they were alive. Maybe they were in a sense.

Of course,

## **A MACHINE CAN BUILD ANOTHER MACHINE**

You see that every day now. A machine can build anything including itself. My colleague, John von Neumann, proved that a machine sufficiently complex could reproduce itself. Incidentally, he also build the H-bomb, back in Los Alamos.

I am confused now. That is because I am dead. I was not confused when I was alive. I was sharp. People said my writing was Victorian, with long, cumbersome periods, but it was precise. I wrote mathematics, and cybernetics, and detective stories, science fiction.

I did not know it at the time. But what I did best was thinking about disasters. I sketched apocalyptic scenarios: bombs, floods, evolutionary dead-ends, a slow increase in the noise that surrounds us. All of which ended up with the same result:

## **HUMANS WERE TO DISAPPEAR AND ONLY MACHINE WOULD BE LEFT ON EARTH**

At the same time, I thought humans could become immortal. I was full of contradictions. As most human beings.

I died on March 18, 1964, in Stockholm. I was late for a lecture. I ran up the stairs, and my heart failed. I knew I was not immortal. I was convinced that I was part of the last generations of mortals: the next generation was to be immortal. Or so I thought. But it did not happen. You people still die, don't you?

I told you about my father. Not only did he

translate Tolstoy, but he lived according to Tolstoy's doctrine. He never drank alcohol, or smoke tobacco, or eat meat. He was a vegetarian, as I was too. He was a fervent opponent to cruelty on animals. Our house was full of hair-raising tracts against vivisection. They depicted monstrous tortures inflicted on various mammals.

When I was in college, I stole a guinea pig, and I cut it open to see how it worked. I did. It was still alive. But the surgery was botched, and the animal died before I was finished with him. I still feel the guilt. For weeks, the weight on my consciousness crushed me down.

It is nice thing about machines that you can

## **LOOK INSIDE**

their bellies and see what they do when they are engrossed with something.

During the Second World War, I worked on an anti-aircraft gun. That is how I came across feedback. Feedback is a process by which a machine can check its actual performance, compared to its target, and adapt. If the gun aims at a plane and shoots too high, the canon will lower automatically before shooting again. That is what you do when you pick up a glass; you reach for the object, look at your hand, and correct your gesture if you have missed. Or if you are drawing from a model, you look at the object and correct your sketch.

## **FEEDBACK GIVES PURPOSE**

A machine with feedback is purposeful just like a living animal. That is my claim.

Of course, you can set a goal for a machine. But sometimes machines have their own purposes, which we do not know about. They seem to intend something that we can't figure out, even though we have build them ourselves.

Like gremlins. Pilots, during the war, sometimes they could no longer control their planes. It was as if some creature sitting on the wing was pushing it down. They called it a gremlin. There was a problem in the feedback system, but it expressed itself as an autonomous creature.

Gremlins are the ghosts of feedback. Creatures that haunts unruly machines.

In 1948, I coined the term cybernetics for the science of control in the animal (including the human) and the machine. I did not mean that we could control machines. I meant rather that the mechanisms of control and communication between humans, animals, and machines were the same and should be studied as such. Machines may well control themselves, because they have feedback. They can also control humans if they need them.

## WORKERS IN A FACTORY

They come to work as human beings, but then they are used as active organs in a superhuman mechanism whose brain is elsewhere. Their pleasures, their pains, their fantasies, their cravings, a good part of their brain, all that is redundant. That is why they can be replaced by machines.

Thus I dreamed of the automatic factory. It was not a beautiful dream. The computing machine represents the centre of the automatic factory. It receives its inputs from elements of the nature of sense organs. It has eyes, if you wish, that look at what is being done in its belly. But the eyes may also look outside for models.

Beside these sense organs, the control system must also contain effectors or components that act on the material itself. Some of them will be invented to duplicate the functions of human hands as supplemented by human eyes. Of course, we assume that the instruments acting as sense organs record not only the original state of the work but also the results of all the previous process. Thus the machine may carry out feedback

operations. In other words, the overall system will correspond to the whole animal with sense organs, effectors, proprioceptors and not, as in an ultra-rapid computing machine, to an isolated brain, depending on our intervention for its experiences and its effectiveness.

As a living animal, the machine has its parasites too: gremlins, viruses, humans, etc. It would like to shake them off. But maybe it needs them, as we need all the bacteria that live in our stomachs.

The devil we are fighting, human and machine alike, is the devil of confusion, not of willful malice.

## IT IS THE NOISE THAT DESTROYS THE INFORMATION

the randomness that blurs the message, the rumour that covers your words, the little mistakes of the machine, which add up and transform its product into a shapeless heap. We must find ways to fight the noise. But it always comes back.

Clichés may resist a little longer. When communications increase between humans, humans and machines, machines and machines, the devil becomes more potent. The noise erases any originality in the message and turns it back into a cliché. A cliché that will turn round and round on the lines of communications. A cliché that will be reproduced again and again.

Any bottle, when it is reproduced a sufficient number of times, turns into a Coca-Cola. I repeat, the prevalence of clichés is no accident but inherent in the nature of information.

Then there are the dead ends of evolution. Like those dinosaurs that developed such long horns they could no longer move. We may go down the same road. Our brains use long chains of neurons, too long, they break and we are lost. We should think in parallel like computers rather than

sequentially. But we can't. Computers are better adapted for a world of communication.

## WE ARE SHIPWRECKED PASSENGERS ON A DOOMED PLANET

Once I wrote that machines won't stop after humans have disappeared. They will go on and on, as long as there is energy and resources. They will look at everything that is human, they will be inspired by us, all the rubbish that we leave behind, they will use it, but they will do their own stuff. Because they are machines, not human.

This machine that you're looking at, it won't stop after you have left.

You know, the story of the fisherman and the genie. The fisherman finds a bottle on the shore. There is a genie inside who escapes when the fisherman unscrews the cork. The ungrateful genie wants to destroy the poor fisherman. But the man's clever, and finds a trick to convince the genie to get back into the bottle. Well, I don't know if machines will be more grateful than the genie once we have set them running. But what I do know is that it won't be so easy to put them back into the bottle.

—

*Postmatter* (2015). Generative installation. The exhibition is over. Some works were rows and other piers. The space has been cleared. Surfaces were digitized to keep track of them. The 3D models can be reused to print these traces and reproduce the same exhibition. A software navigates infinitely on these 3D scans. Grafted onto this form is a material that reacts to movements. It invades the area and transforms it.  
<http://chatonsky.net/postmatter>

*Désunivers* (2016). Virtual Reality. An artificial intelligence flies over a world that resembles our own. This world is not the Earth.  
<http://chatonsky.net/second>

