

RESEARCH PROJECT  
MASTER DEGREE IN GRAPHIC DESIGN

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# **SCIENCE AND ITS IMAGINARIES**

UNDERSTAND THE HUMAN BODY

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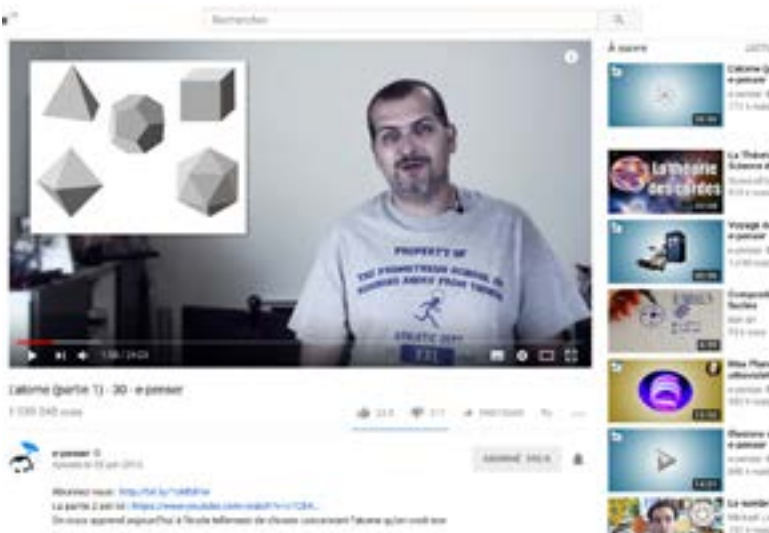


To answer these questions, I studied the indivisibility of art and science through the history of scientific images. Anatomy has been a model for the development of the spirit of scientific discoveries. As a matter of fact, the evolution of drawing, particularly Leonardo DaVinci's drawings made it possible to understand the morphology of the body. At the time, the medical representation of the body was inseparable from an artistic one. For example, the drawing of Juan Valverde de Amusco shows an *écorché* holding a knife in one hand and his skin like a sheet in his other hand. We can also find theatrical staging in the work of the anatomist Honoré Fragonard in the eighteenth century. Indeed, he used real *écorchés* covered with wax to show the morphology of the muscles, veins and joints. Strangely enough, Fragonard represented them on horseback or dancing.

Over time with a broader knowledge, art and science became disassociated. However, we can notice that artists and scientists have always been fascinated with each other. Today there are numerous collaborations between artists, designers and scientists. With these collaborations, designers and scientists can compare their different points of view and experience in order to innovate and create.

The creation of different disciplines led to a lack of scientific knowledge. It is true that we do not need complex scientific knowledge in our daily lives, whether at work or at home. Nevertheless, science is part of our lives, and citizens can have their say on scientific issues





like climate change, GMOs or medications, but they are too often discouraged by the complexity of these topics. We should all feel concerned, and it is important for all of us to understand and participate.

Popular science emerged in response to the lack of scientific knowledge. Popularization is defined as the act of making scientific knowledge understandable and attractive to the general public.

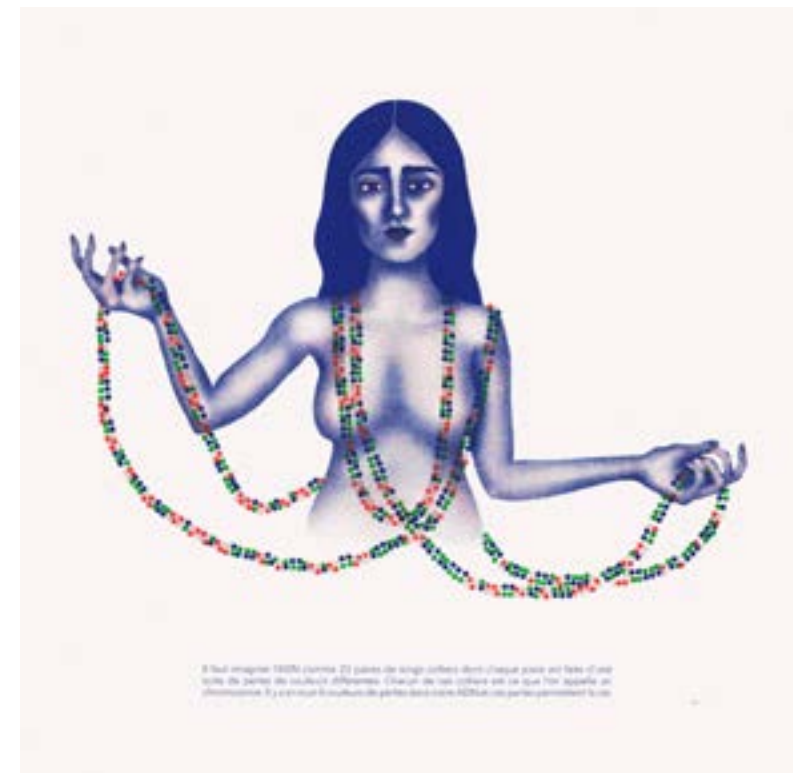
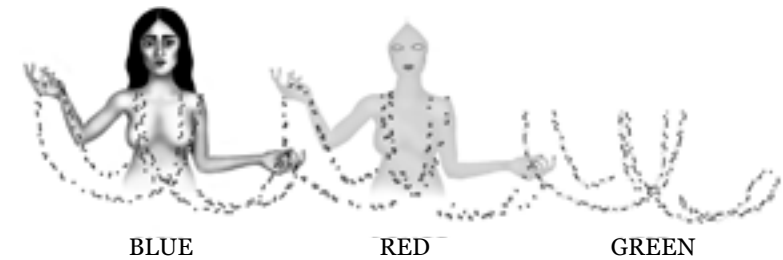
We think that popularization is quite new, but it appeared at the same time as the development of science. In the 16th century there were cabinets of curiosity which collected mysterious objects from new territories. The collectors at that time wanted to understand the creation of the world. Then, museums took over to popularize scientific knowledge. The Palais de la Découverte, created in 1937 in Paris, broke away from the traditional museum. It brought science out of laboratories in order to engage the public in scientific experiments. We can also quote the *Encyclopedia* of Diderot and D'Alembert which changed people's way of thinking and gave people the opportunity to learn by themselves.

Today, popularization is on TV and radio programs, in magazines, in YouTube podcasts, but also on Wikis where people can share their knowledge. Thanks to popularization, citizens are aware of the evolution of science. It awakens their critical sense, it improves the work of researchers, it improves teaching, creates vocations and above all, it entertains people.

As I said before, popularization, and especially popularization with illustrations sometimes lack sensibility. Indeed, some drawings and images do not awaken the sense of wonder and do not necessarily convey the passion for science. Images more creative than the traditional ones can bring new visions and perspectives. Creativity is the ability to change our perception, the ability to see things differently. Steve Jobs explored lots of new and different things in his life like calligraphy, meditation, which that is probably the reason why he had so many bright ideas. Louis Pasteur discovered molecular chirality probably because he practised the art of lithography when he was a student. Thanks to his artistic experience he made his first scientific discovery. Sometimes, we have to change the way we work, our habits and the images that we use to open ourselves to new ways of seeing, of designing and creating.

During my internship, I had the chance to print a personal project on a risograph. I decided to illustrate DNA in a poetic way to understand it better. I represented a woman holding numerous necklaces and I wrote the following caption below: "Imagine DNA as 23 pairs of long necklaces. Each pair is made of a series of different color pearls. Each of these necklaces is a chromosome. There are four colors in our DNA and these pearls make life possible."

I then showed this image to scientists to know its qualities and flaws. I contacted Guillaume Verdy, a medicine student and Vincent Bonhomme, a doctor in biology and a popularizer. Their feedback were quite negative as they







noticed a lack of accuracy. According to them, my drawing may raise curiosity about the DNA but cannot provide any real scientific knowledge.

This feedback made me realize the difficulty of popularizing especially when we are not experts. Can I, as a non-scientist, be able to popularize science ? Do I really have the right to ? According to Vincent Bonhomme, we can popularize any subject that we know a little. According to the astrophysicist Roland Lehoucq, it is not necessarily the specialist who speaks best of a particular field. He says that a sincere and humble person who works on a particular subject can popularize it in a good way.

One of my favorite illustrator is Marion Montaigne not only for the way she draws, but also for her originality. In 2008, she created a blog named *Tu mourras moins bête, mais tu mourras quand même* which consists in popularizing science through a character named Professeur Moustache. The illustrations of her blog have been adapted into comics and recently into a cartoon on Arte TV channel. I really like this illustrator because she perfectly mixes scientific accuracy with a humorous tone. These drawings erase the clichés of mad scientists. Indeed, scientists are like you and I, with their own sensitivity, doubts, mistakes. Marion Montaigne's career is interesting because at the beginning of her blog she made research on subjects that she did not know at all. Then, scientists contacted her to collaborate as it was very important for them to have someone talk about their research. Indeed, most scientists's work

remain unknown to people though they sometimes work several years on a particular subject. Scientists often have difficulties in popularizing their discoveries. Indeed, they use a lot of precise words, and they have difficulty in explaining with simpler words. Marion Montaigne is not a scientist, so she does not mind using some simple and common words and images to speak about a scientific topic.

*J'apprends* magazine also inspired me a lot. It is a French magazine about science created by Sophie Gendron et Daphné Geisler in 2017. These graphic designers impose themselves some unusual rules in order to make their magazine. For example, it is forbidden to study the subject of an article before final printing. It is also forbidden to resort to an external source other than their own knowledge, that is to say no books, no internet or calls to a friends. According to them, communication and communication errors are human characteristics. Their magazine contains a mix of well-known notions and theories as well as personal interpretations and inventions. The pages mix patterns and texts with poetic and delicate illustrations. This magazine has a controversial and disconcerting principle but the content is not really misinformation because there are no lies, but truthful statements with a large part of fantasy. The aim is not to make a spoof magazine but a poetic one.

For my final project, I decided to follow the same direction. I really wanted to deal with science and make people





feel more at ease. I did not necessarily want people to understand everything. I wanted them to feel interested in science, and more precisely in anatomy. The goal of my project was to stimulate wonder, to arouse a scientific interest. I thus worked on several projects.

In the first one, I aimed at representing the chemical formula of the molecule the lily of the valley in three D because I love its perfume. To my mind the representations of the molecules used in chemistry and their structures are particularly interesting as their shape and their geometry create patterns. With my representation in volume, I made a pattern invisible to the naked eye, though present, visible. I highlighted the smell making it palpable and visible in space. The structure represents the flower atomically because the goal is to be as objective as possible in order to have a scientific perception of reality. I then moved away from the scientific aspect in adding floral elements that express my poetic vision of the perfume. These flowers rise in the air, spread in space like a fragrance. With these elements, I gradually moved away from the concrete, real aspects to reach an imaginary world.

In the second project, I represented a human heart cuts in white paper. With Arduino software, I created a code to create a light emitting diode chaser. The LEDs light up one after the other to follow the path of the blood in the heart. The green LEDs represent the oxygen-poor blood entering the heart while the red LEDs illustrate the trajectory of oxygen-rich blood coming out of the organ. I played with a



reversal effect because the wet and bloody heart becomes white and dry. The heart is seen as machinery as it is made of electrical impulses, tangled wires and an electronic board.

In the third project, I used body painting technique to represent the digestive system. My purpose is to have a glimpse of the inside of the body without opening it. My idea is to move away from the explanatory diagrams present in educational books or on the internet, but also to avoid the repulsive effect we can feel when dissecting. The plant elements sewn on the photograph reminds us of sutures and also of a forest. As the medical student and writer Giulia Enders says, the gut is "a huge jungle inhabited by the most amazing creatures."

In my final project, I worked on the importance of drawings in the understanding of the body. We only vaguely know how our digestive system works that is why I worked on the book *Gut : The Inside Story of Our Body's Most Underrated Organ* written by Giulia Enders. This book explains the functioning of the digestive system, allergies, the influence of the intestine on the brain, the immune system and bacteria, etc. with humor and relevant metaphors. I made eight illustrations which represent the path food follows in our body. These illustrations are like diagrams because there is no background, all the elements are isolated, they are only outlined. Diagrams makes it easier to believe in scientific information. In this project, I questioned whether the drawings could be of





any scientific value. In people's minds there is a break as diagrams belong to the scientific field and paintings to the artistic field. That is the reason why I combined both in this project.

These illustrations show two trajectories. I show the circulation of food while dealing with the flow of knowledge. Indeed, I am a graphic designer who knows little about science, and explains it in a rough way. These images are meant to be looked at by non-scientists, and they are meant to be bought by scientists. I imagine these posters could be bought by nutritionists or general practitioners to be placed in waiting rooms. Waiting rooms are places where people do not know what to do, they are on their phones, they read magazines. They can take the time to look at the images placed on the walls. These images can be landscape photographs, prevention posters, paintings on canvas, etc. They can be related to the medical field or not. While waiting, people have the time to look at my posters and think about their meaning. These images, which bring a new vision of how the body works, can trigger a lot of things in people's minds.

My work is controversial. Some people think that they are not scientific images because they are wrong images, others find them valuable. We need this kind of images to imagine science in another way, to feel more concerned by science.

I sincerely thank Chrisitine Orsola for helping me write this essay. Thank you for your precious time.

## Images

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- p. 05 : Juan VALVERDE DE AMUSCO, *Anatomia del corpo humano*, 1650, Edition : Antonio Salamanca and Antonio Lafreri
- p. 06 : Ole WORM's cabinet of curiosities, Frontispice from *Musei Wormiani Historia*, 1655, Biblioteca Estense, Modena, Italy | Bruce BENAMRAN speaking popular science in YouTube channel E-penser, 2015
- p. 10 : Marion MONTAIGNE, *Tu mourras moins bête, mais tu mourras quand même*, 2011
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