topic of the month:
FOOD

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ISSUE
#1

LEVE DURA

August, 2021.

SCIENCE, TECHNOLOGY, AND FOOD

Levedura is a monthly magazine where experts and scholars discuss science and technology. Each edition has a main theme connecting all texts. The pieces you will find here are personal and well-researched reflections on topics that make the gears in our contributors' heads spin, even when writing on topics other than their main research or field of work. If you have a pitch for an edition or article, please reach us at levedura.blog@gmail.com

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IN THIS EDITION YOU WILL FIND

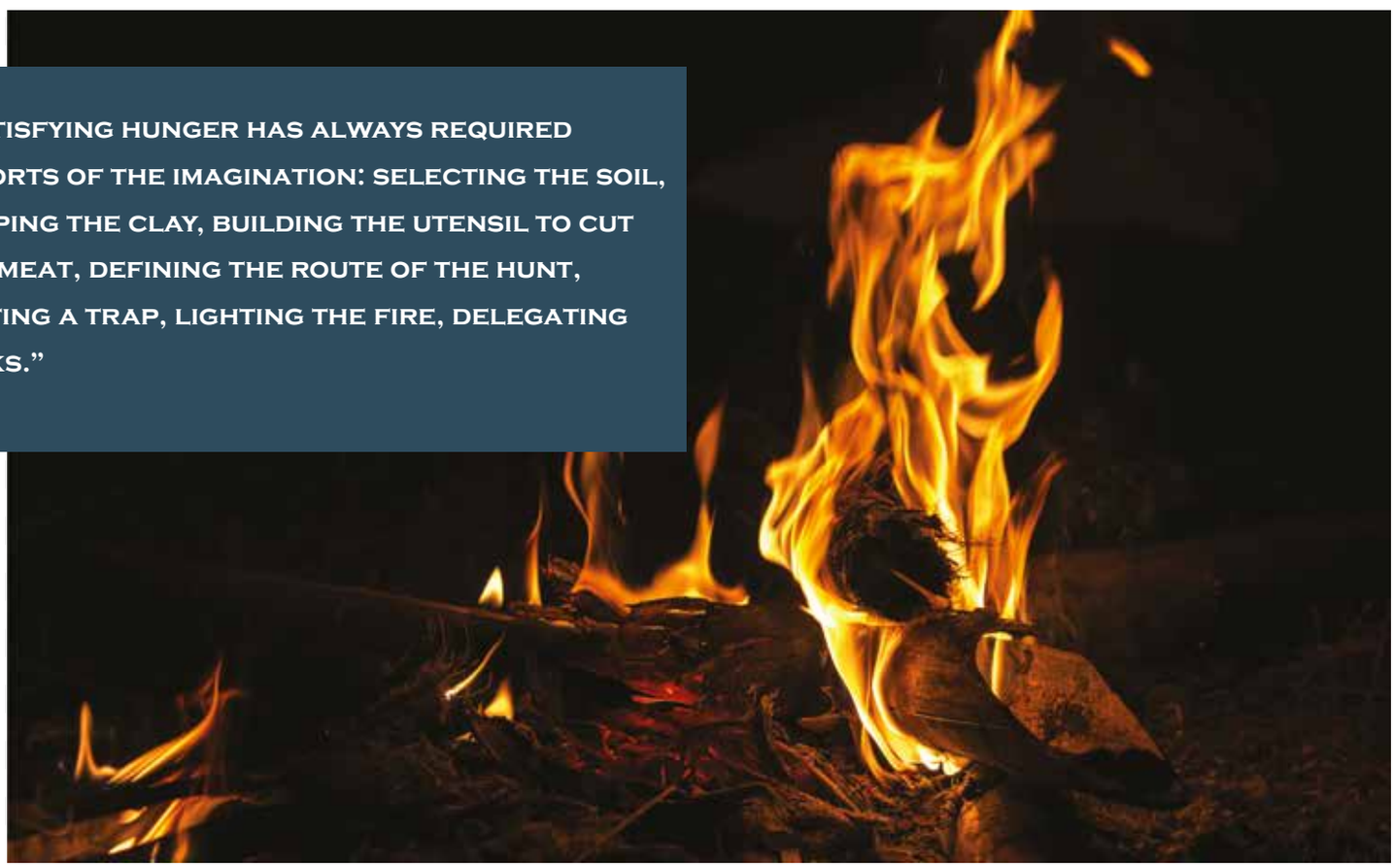
August, 2021.

THE CREATION OF FOOD

by Julia Garcia

What was the first story ever like? Impossible to say with certainty, but we can make some safe assumptions about the location and the topic: around a shared meal, about how our most pressing biological imperative was met that day. For all animals, food is both the reason to wake up every day (or night) and the fuel for all metabolic processes needed to live. Early on for humanity, food must have become the focus of conversations, anxieties, joys and, finally, our imagination.

"Satisfying hunger has always required efforts of the imagination: selecting the soil, shaping the clay, building the utensil to cut the meat, defining the route of the hunt, setting a trap, lighting the fire, delegating tasks."



Nature did not come with an instruction manual or cookbook: it was not always possible to anticipate what was safe to consume to maintain energy and health, nor which fruits, leaves, seeds and mushrooms were dangerous to eat. There was a time, of course, when every meal carried a great risk of death, owing to a still very incipient understanding of natural space. How to pass on to future generations the importance of processes already established to ensure the safety of everyone, such as plants that were nutritious and animals that did not pose danger? With songs and cults, with drawings and paintings, with games and rituals—and, inevitably, with the stories passed down to each new generation. These stories teach the young ones to understand the world according to the knowledge socially constructed and organized creatively. Eating habits, determinant for everyone's survival, are part of this collective construction.

THE CREATION OF FOOD

by Julia Garcia

Satisfying hunger has always required efforts of the imagination: selecting the soil, shaping the clay, building the utensil to cut the meat, defining the route of the hunt, setting a trap, lighting the fire, delegating tasks. Creative thinking may thus have been a catalyst for our ability to explore the potentials of food, both to multiply and modify it and to turn it into art in the form of illustrations or stories and thus perpetuate our affective, and intimate, relationship with food.

Artistic expression even predates agriculture by a lot: more than twenty thousand years separate the archaeological evidence for these evolutionary landmarks in our species. For oral storytelling, of course, there are no fossils or mortal remains, but adaptations have remained. Stories replicating similar elements, such as Gilgamesh's immortality fruit and the theft of fire by Prometheus, abound around the world, helping tellers and listeners work out anxieties that have undoubtedly accompanied humanity since our dawn—such as understanding that food holds both life and death, health and disease, survival and extinction. Through art and the reproduction of stories, our species has been gradually mapping its place in the world and its relationship with it—from the start, it seems, with food as the source of inspiration.

It is possible, then, to suggest a reading of our relationship with food as closely linked to the history of fiction and artistic creation—the attempt to reproduce that which does not yet exist in physical form. Cassava, for example, was privileged in the territory of present-day South America thanks to the versatility of its applications, as we can eat it boiled, fried, in pão de queijo, farofa, tucupi, sagu, boba tea, tapioca—no such list can be comprehensive. Corn, similarly, can take the shape of breads, cakes, tortillas, pamonha, tamales, curau, polenta, porridge, farofa, among many others. The first tool used to grow cassava and corn was imagination: the ability to see it before nature actually made it tangible. And each of these foods, of course, carry stories of families, cities, nations, times—they carry the teachings that have allowed the people of today to eat roots and grains tamed for the first time over fifteen thousand years ago.

It is not by chance that cassava and corn are both sacred for several Indigenous peoples: as the first humans of the continent travelled along the coast from the now submerged region of Beringia, they got to know and enhance these plants along the way. The history of the land is inextricably connected to the people's relationship with the crops consumed. Groups around the world have found in their staple foods, besides energy needed to fuel the neurological development of the Homo sapiens (whose large and heavy brain uses up many carbohydrates), the source of inspiration for myths, cults and symbolic representations of gratitude and admiration.

August, 2021.

THE CREATION OF FOOD

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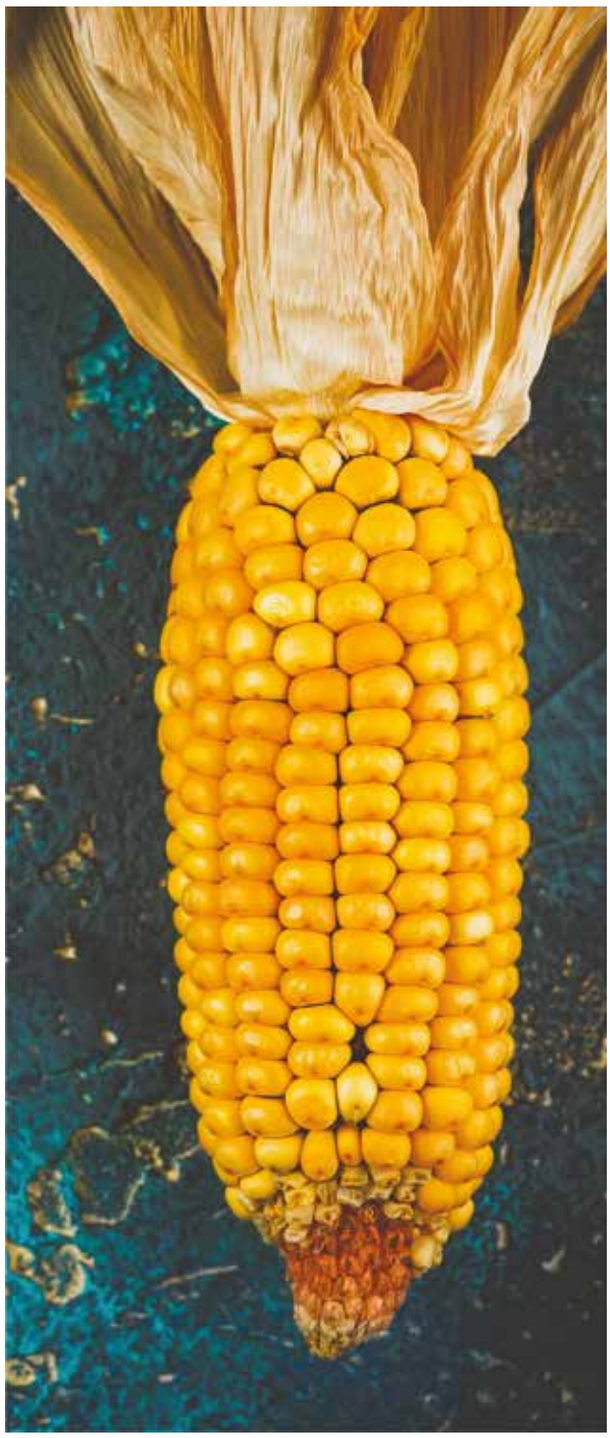

Across various religions and beliefs, there are gods, saints, spirits, forces of nature representing the ability to get food from working the soil, hunting, fishing or domesticating animals—such as the story of Persephone, the daughter of Demeter kidnapped by Hades and trapped in the underworld for six months every year. This myth mirrors the cycles in agriculture and contextualizes the scarcity during the winter; it shows that there will be abundance again, if you grow food when Persephone is out. In our point of view, so far removed, it could seem that the myth of the queen of the underworld is a poor substitute for systematized knowledge of nature; however, as Michael Austin argues in **Useful Fictions**, the evolutionary advantage of storytelling is due not to the richness of factual details in communicating truth, but rather to the possibilities the narrative proposes to guarantee our survival. Among the examples, the author imagines a human being from tens of thousands of years ago who, upon hearing a noise in a bush, decides to flee, afraid of being found by predator. For the surviving group, who will later explain why they moved, it doesn't matter whether there really was something dangerous behind the bush—the story will have to account for the ominous possibilities of noise, the woods, the consequences of fear and dispersion. And it will undoubtedly teach valuable lessons about the land where these humans built their lives.

THE CREATION OF FOOD

by Julia Garcia

Scientific knowledge is, in this sense, an ingredient of culinary and cultural stories, as is the case of the Mayan creation myth in which the first human beings were made from maize paste: in fact, maize became a staple since Indigenous peoples in Central America developed nixtamalization (a process that makes corn more nutritious), and naturally the people associated the food with the source of human life. Similarly, although the Persephone myth does not go into specifics of the stages of growing food, it helps to understand the laws of nature as non-negotiable. Food is what it is—part of a cycle of fertility and death—and this is essential knowledge to peacefully exist in the natural space.

Thus, we can imagine that storytelling came about as a result of the human experience of producing our own food, either through the cooperation needed to feed everyone, whether during the act of sharing a meal together and wanting to complement the event with conversation. There must have been talks between the group that mastered local plants and cooked the ingredients to make them more flavourful and nutritionally dense; there must have been excited conversations between the people who walked back home with fresh game. The stories that came out of these encounters with food perpetuate recipes and cooking methods, too. Ancient agricultural techniques practiced by Indigenous nations around the world have been passed on orally for thousands of years. Similarly, items like cheese, tofu, extra virgin olive oil, palm oil, and fermented beverages have survived across millennia, and these complex chemical processes are passed down generation to generation, as part of family traditions.

The ability to modify food survives in our species thanks to the same creative machinery in our brain that allows us to play, invent, and build. Creative thinking allowed solving problems such as low durability, risk of food poisoning, and bad taste through the formulation and testing of hypotheses, such as placing the hunted animal on fire until its meat changed colour and texture and combining different herbs to flavour the food, in addition to keeping it edible for longer. Molding clay into the shape of a bowl allowed to cook a mixture of different ingredients at the same time, saving critical resources. Large bowls used for millennia to boil water suggest the timely invention of soup, the original one-pot dish that can feed a whole family at once. With the need to store and contain grains and dried fruits, the containers take on new forms: jars with lids, plates, and cups. Soon, they were all be decorated to indicate their content or use—the birth of design—and, perhaps above all, for pleasure. The containers express on the outside the fact that they carry the most beautiful thing we own on their inside: something that can stop hunger. Simple as that: food.

August, 2021.

THE CREATION OF FOOD

by Julia Garcia

Around food, throughout our history on Earth, we have developed both science and music, singing, literature, religion, philosophy and architecture. In fact, cooking shares a certain contempt for pure utilitarianism with art. The distance between **ingredients** and a **meal** is the act of rearranging food with attention and affection. The pleasure and affects provoked by the act of eating make up our frame of reference early in life and inevitably influence our tastes, desires, dreams. A trip to another country necessarily involves a tour of local foods. All our main celebrations assume typical dishes, sometimes the same for impressive stretches of thousands of kilometers. All classic cuisines were born out of the act of members of each family coming together to produce food for everyone; all the scientific knowledge we currently have about production, handling and distribution of food is based on the lessons shared between nations and generations.

We are as much made up of corn as we are made up of the stories we tell about corn. The first story, I would have to guess, has got to have been about food.

THE BREAD RUSH

by Larissa Costa Duarte

translated by Julia Garcia

As apparently was the case for many people, my relationship with food underwent several transformations throughout the COVID-19 pandemic, particularly in the initial months of isolation. I think the first time the pandemic got me thinking about food was in the early days of the first lockdown in the city I lived in, in early 2020. At that time, I went to the market with my wife, as I did weekly, and chanced upon something that I hadn't seen in years: entire aisles with completely empty shelves. It made me think of when I was a child and I went with grocery shopping with my mother the day after "special deals day." She always laughed as we walked in the deserted corridors, saying, "It looks as though a hurricane made landfall here."

On that day in March 2020, I had that same feeling of walking over rubble. In the bakery section, only a few scruffy and beaten bags remained in the space previously filled with dozens of colorful packages by different brands. In the baking aisle, not even that. No bags of flour in sight—no yeast. In the days to come, these everyday products, now suddenly scarce, mobilized the formation of small solidarity networks in our small immigrant community. If someone found flour in some obscure market, everyone else was immediately notified on social or WhatsApp. If someone had some leftover yeast, the neighbors would soon organize a drive to share it.

THE BREAD RUSH

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This bread rush, so to speak, made me think a lot about food and culture, and about how food is one of the central elements around which societies are organized. In retrospect, it seems to me that we were looking for some kind of autonomy and—why not—a sense of control in the face of such a frightening and unfamiliar situation. By making our own bread, we would necessarily reduce our trips to the market and other establishments. Having flour at home, we would have a range of food possibilities always at hand, for all main meals. But it wasn't just that, I'm sure. Making their own bread seemed to have become a kind of collective catharsis and therapeutic activity for many people.

In my network of friends and acquaintances, homemade bread became one of the main topics of exchange and engagement on social media. Suddenly, it seemed like everyone was sharing recipes, baking things, making sourdough starters, sharing memes about the process. Of course, as is the nature of the internet, the subject wore off after a few weeks. Also, the shelves were re-stocked, and we learned some sanitary strategies to get to the market and other places with some safety. On the other hand, many people seem to have developed an appreciation for the particular flavors of homemade bread, or even for the process of gathering the ingredients, activating the yeast, kneading the dough, and all the other laborious but engaging steps.

"Technology comes up when the first group of people apply their knowledge to solve problems and improve their daily activities."

Thinking of this collective and spontaneous interest in baking reminded me of a publication by physicist Seamus Blackley. Blackley is best known for his work in the video game industry, but in this post I'm referring to, he was talking about how he brought two of his greatest passions—cooking and archeology—together in one incredible experiment. His Twitter thread chronicled his endeavor to make homemade bread using natural yeast produced from dormant yeasts from ceramic pots that had been buried in ancient Egypt for over four thousand years.

THE BREAD RUSH

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The yeast culture used in Blackley's project was provided by two museums in Boston, directly from their archaeological collections. Due to the practically infinite nature of yeast, which can multiply and renew indefinitely with the right precautions, it was possible for institutions to produce several samples of the levain for laboratory study and grant one of them for Blackley's personal project.

Naturally, the extraction of the material and the entire process of reviving the yeast were monitored by experts. Archaeologist Serena Love and microbiologist Richard Bowman helped to ensure that no artifacts were damaged in the extraction, and that the culture reproduced without contamination. The three of them were careful to feed the yeast with a species of wheat genetically identical to the one grown when the ceramic pots were buried 4,500 years earlier, and which is significantly different from the wheat we consume today.

Genetic tests carried out on the culture sample showed that the yeast came from a yeast strain that had existed for at least 700 years before being placed inside the excavated ceramic pots used in the experiment I describe here. But we know from archeological remains that humans had been making bread long before that, at least 10,000 years ago. It is interesting to mention that, for a long time, the creation of bread was credited with making our species transition from largely nomad to farmers—it made sense to think, after all, that bread would have been created after we had mastered the cultivation of wheat. But a discovery made by archaeologist Amaia Arranz-Oteagui in Jordan in 2018 called into question the prevailing theory.

Arranz-Oteagui found traces of bread dating back to 14,000 years ago. The discovery opened two new possibilities for scholars in the area: the first, that the Natufiana gatherers, and not the Egyptians, would have created the bread; the second, endorsed by researcher Lara Gonzales Carretero, an archaeologist specializing in prehistoric food traces, was that bread would have inspired the development of planting and encouraged the development of agricultural techniques that would allow the emergence of sedentarism as a way of life. Contrary to what was believed until then, agriculture could have been developed after humans started making bread.

In any case, there have certainly been developments in the production of this food since we started producing it. Part of the Gaulish people, for example, developed the use of beer foam as a leavening agent, which produced a lighter bread with a milder taste than the one made from levain, and which became popular with the French. The Gauls actually developed very sophisticated technologies in relation to bread, from wheel-driven harvesters to underground silos capable of preserving and hiding the grain.

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THE BREAD RUSH

by Larissa Costa Duarte

translated by Julia Garcia

So, what always brings my thoughts back to the history of bread made with some four-thousand-year-old yeast is a certain fascination with the idea that science and technology derive directly from our species' relationship with food, and with the different demands that the food brings to a community. Food needs to be safe, and for that to happen, a large part of food requires some kind of intervention, whether in the form of heat or sterilization. Food needs to be durable, and that's why amazing conservation technologies such as pickling and dehydration have been invented all over the world, just to name a few. Food needs to be strategically reproduced to feed as many people as possible in the shortest possible time.

Finally, food is a primordial necessity, and for this reason, it is likely that it was the main catalyst for the first technoscientific practices and experiments of our species—many of which so sophisticated that they survive to this day, some almost unchanged. This makes me think that we often need to remind ourselves: technology and innovation didn't arise during modernity, with our factories, super vehicles and subsequent digital revolution. Technology comes up when the first group of people apply their knowledge to solve problems and improve their daily activities.

So, while the yeast I use doesn't come from the bottom of a historical artifact buried in the desert, its technology somehow connects me to these ancestral bakers, the first men and women to test interactions between a specific set of fungi and ground wheat. Even before writing allowed for systematization and communication of knowledge throughout eons in different places around the planet, yeast made it possible for us to transmit a technology forward for at least 14,000 years. This technology has travelled from nomadic gatherers in the Middle East, through the millenary empire of the Nile peoples, through navigators in the Gaul region—besides the dozens of other civilizations that developed other versions of this food across time and space.

I find it very interesting, therefore, that many of us, at a time of crisis and uncertainty as profound as the COVID-19 pandemic has been, have revisited our relationship with bread and yeast. Some things have changed in the last 14,000 years, it's true; for example, we have made it a habit to record and share the results of our culinary experiences through our small high-end smartphones. On the other hand, this food still carries an ancient history of cooperation and victory over scarcity. It is, above all, a fundamental milestone in the production and multiplication of knowledge.

FEED YOUR SELF

by Ana Maria Bercht

Cooking has been a work overwhelmingly done by women. According to Douglas Bowers, in 1900 time spent in domestic work was equivalent to that of the paid labor force in the United States: 44 hours a week. This unpaid labor was done by women and most of the work hours involved activities related to the preparation of meals. Marriage, as the basis of a heterosexual relationship contract, and the lack of ways for women to avoid or control pregnancies, meant large families that had to be cared and cooked for. The close entanglement of the roles of motherhood and being a wife, which can also be considered forms of labor, did not spare women that additionally occupied a space in the paid working force in the public sphere from being attributed the work of providing meals for the rest of the family. Moreover, during pregnancy and postpartum we could think of a woman's body itself as a sort of a food source, generating the nutrients necessary to the development of the fetus and afterwards, the baby.

"FEMININITY TEACHES US, LITERALLY AND SYMBOLICALLY, TO OCCUPY LESS SPACE, TO FEED OTHERS RATHER THAN OURSELVES."

At the same time, we have an increase in psychopathologies that involve eating. In fact, anorexia, one's deprivation from the act of consuming food, was a common manifestation of what was named by male physicians in the beginning of 1900 as hysteria. Hysteria was a disease that can be understood as women, well... **being sick** of having to be women in a context where male power dictated most aspects of life. With the establishment of medical and health specialties, such as psychiatry and psychology, a particular attention started to be paid, specially in 1980, to the fact that most of those developing mental health problems such as nervous anorexia and bulimia were of the female sex.

FEED YOUR SELF

by Ana Maria Bercht

While some health experts and researchers, notably men, understood this in an essentialist manner, trying to locate what exactly in women's biology could be the cause for such a disparity, female psychotherapists such as Susie Orbach took another route. Working with a feminist framework makes it clear that the social conditions and the power structures that shape womanhood have a big part in the development of these maladies, just as they have in other highly gendered disorders. This explanation goes in a direction that points out that culture (from the norms of femininity to how families are usually organized) not only exacerbates a condition of problematic food consumption, but effectively **produces** it. Not only that, but what we call a pathology, in this case, can actually be understood as just an extreme in a spectrum (or as Orbach says, a "continuum") of normative female suffering.

Femininity teaches us, literally and symbolically, to occupy less space, to feed others rather than ourselves. When this is done in a "proper" amount, that is to say, in a manner that serves the purposes of patriarchy while keeping women functioning and playing their roles, it is considered normal. When it becomes so extreme that it creates a psychological problem with a high death rate, as is the case of anorexia, it becomes a pathology. Here lies the importance of understanding psychopathologies not only individually, but as collective manifestations that can point to oppressive structures of power.

When I say that girls and women are taught to feed others rather than themselves, to put others' needs ahead of their own, the word "self" comes to play in multiple ways. Objectification Theory, developed by Barbara Fredrickson and Tomi-Ann Roberts, was created as a framework to explain why pathologies such as depression, eating disorders and sexual dysfunctions disproportionately affect women in comparison to men. Cultures where women and girls value are extremely based on their appearance, how they look and how they can serve others can end up creating a phenomena called self objectification. The concept of "self" has more than one meaning in psychology, but can roughly be interpreted as the subjective experience that we have of ourselves, which includes how we see and treat our bodies. Self objectification happens when we internalize a third person perspective as a primary vision of our own body, in a way where we end up treating ourselves as objects to be looked at.

August, 2021.

FEED YOUR SELF

by Ana Maria Bercht

With the rise of social media, we are being more and more flooded by images. Actually, not flooded: **fed**. And it's not just propaganda anymore, that comes from an outer source. It is we that feed these networks with pictures of us: the famous "selfies". Getting positive feedback (in the form of "likes") in the virtual world includes having a "good" body, which in turn, especially for women, means looking as thin as possible, no matter what. In order to post beautiful **selfies**, a lot of girls are developing prejudicial forms of selves, spending energy and efforts constantly thinking of how others are seeing and evaluating their appearance. Body image problems, a frequent symptom of anorexia and bulimia, are becoming increasingly common. How are we feeding our bodies and our senses of **self** in a virtual era based on photos?

From 1900 to now, things have definitely changed. We are certainly no longer taught femininity through handbooks on social etiquette that said a polite woman cooks all meals, but eats little and delicately. But we are still learning what being (and looking like) a "good woman" entails through other, more technological and better disguised manuals. Female hunger is still an issue; hunger not only for food, but for power. For a world where we are valued (and treated) as human beings, not objects. A world where our identities are not centered on being pretty.

I don't know if this happens in other countries, but in Brazil dish towels are usually ornamented with hand painted drawings and quotes, usually about religious themes. As this is an object for kitchen use, you can imagine how happy I was when I found one that said: "You can't fight the patriarchy if you are hungry". Touché, dish towel, touché.

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The Bread Rush

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Feed Your Self

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