

## **Tecnodiversidad y maíz. Sugerencias para la búsqueda de una cosmotécnica mesoamericana.**

## **Techno-diversity and maize. Suggestions for the search of a Mesoamerican cosmotechnics**

Victor G. García-Castañeda

candidato a Doctor en Filosofía por la Universitat Autònoma de Barcelona

### **Abstract:**

In this essay, through the concepts of cosmotechnics and technodiversity proposed by Yuk Hui, I present an exploratory sketch regarding the search for a Mesoamerican cosmotechnics from the perspective of the deep relationship that pre-Hispanic cultures have maintained with maize since ancient times. I consider that this relationship expresses a particular Mesoamerican cosmotechnics that—in Hui’s terms—manages to unify “the cosmic order and the moral order through technical activities” in these societies, even to the present day. Similarly, I argue that the biological, agricultural, and gastronomic techniques—such as the milpa, chinampas, and nixtamalization—which have historically been woven around maize are an example of technodiversity that has persisted and withstood the onslaught of the capitalist logic. Finally, I affirm that this cosmotechnics has the potential to be configured as a cosmopolitics that must first overcome the obstacles of nationalist and identity discourses that became prevalent in post-revolutionary Mexico through the indigenist turn, and that are currently configured around the defence of traditional maize against the attempts to introduce its transgenic equivalent in recent decades.

### **Keywords:**

Cosmotechnics, Technodiversity, maize, Mesoamerica.

## 1. The Triumph of the *Gestell*?

The exponential development of technology that humanity has experienced during contemporary times has become one of the main focuses of attention in the humanities and sciences. Although *technics* has always been present in the history of humanity as a condition of evolutionary co-determination—whether as technical objects that serve us as tools, as technical mediation processes or as environments in which we are immersed—it doesn't strike as an exaggeration to assert that never before in the history of mankind has reality been so severely bound to the multiplicity of effects that result from the baroque ubiquity of technical objects in our lives. It is perhaps therefore necessary to ask ourselves about the possibility of going beyond an idea of technics as an “anthropological universal”, an idea that may justify the view that technology emerges in the same way in all latitudes of the planet, with a greater or lesser degree of “advancement” or “development”, as if there really was only one way of implementing technics by the various cultures, or as if all the multiplicity of technicities in the world correspond to a single univocal evolution.

If one travels to almost any city in the world, one will find technical objects that are the same or of great similarity. This is likewise the same for industrial processes and methods that have been extended globally. This standardisation seems to be the result of an extension of modern technique that has taken place since the Industrial Revolution, the historical moment where science, technology and capital consummated a marriage that has managed to impose its logic on the multiple forms of technicity that have existed since. However, taking univocal standardisation as a cause and not as an effect of a particular sociotechnical and techno-scientific framework only reinforces the illusion that technical evolution positively obeys laws that are mounted on each other, orienting linearly towards the same historical *telos*, whether a utopian or dystopian singularity, as many accelerationists propose.<sup>1</sup>

Against this gloomy landscape that the narratives that unfold around contemporary technology have adopted in recent years, it is necessary to construct views that avoid falling into a dualism that only offers innocent optimism or schizoid pessimism as options. It is in this sense that Yuk Hui intends to go beyond the conception of technology as an anthropological universal, as was proposed by the French archaeologist André Leroi-Gourhan, parting from the following antimony:

- (1) Technics is anthropologically universal, and since it consists in the extension of somatic functions and the externalization of memory, the differences produced in different cultures

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1 See: Armen Avanessian and Maurio Reis, *Aceleracionismo. Estrategias para una transición al post-capitalismo* (Buenos Aires: Caja Negra, 2017).

can be explained according to the degree to which factual circumstances inflect the technical tendency;

(2) Technics is not anthropologically universal; technologies in different cultures are affected by the cosmological understandings of these cultures and have autonomy only within a certain cosmological setting—technics is always cosmotechnics.<sup>2</sup>

This antinomy expresses the need to think about technology beyond its modern univocal configuration, echoing the criticism that Martin Heidegger suggested in his lecture *The Question Concerning Technology*.<sup>3</sup> Heidegger refers to the concept of *Gestell*—commonly translated as “enframing”—to refer to this all-encompassing mode of unveiling of being that modern technique imposes. If pre-modern techniques, according to the German author, were capable of revealing and “bringing forth” the truth through *poiesis*, what modern technique does is to incorporate all kinds of truth-uncovering within the calculating and irreflective logic of science, and whose technological model turns nature and human beings into mere resources in standing-reserve.

The effects of the totalizing techno-capitalist impetus are experienced quite explicitly: the standardisation that results in similar technicities, the increasing automation and technological autonomization, the accelerated manufacture of products, the reduction of the human to a resource and so on. If the only notion of technics to mind is the extension of these phenomena in our lives, surely, the only result will be the acceptance that the *Gestell* has triumphed on our planet. A symptom of this hopeless resignation is illustrated in the famous—or maybe infamous—phrase referred to by Fredric Jameson and which has been repeated *ad nauseam* by impressionable students of philosophy: “It is easier to imagine the end of the world than to imagine the end of capitalism”<sup>4</sup>; a capitalism that is supported by an omnipresent technological infrastructure, a truly autonomous *système technicien* like the one that Jacques Ellul predicted many decades ago.<sup>5</sup>

But, instead of accepting the collapse with resignation, we need to persevere in spite of it. Although capitalism undoubtedly constitutes the hegemonic structural framework in urban and industrialised

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2 Yuk Hui, *The Question Concerning Technology in China. An Essay in Cosmotechnics* (Falmouth: Urbanomic, 2016), 19.

3 Martin Heidegger, “The Question Concerning Technology” in *The Question Concerning Technology and Other Essays* (New York: Garland Publishing, 1977).

4 Fredric Jameson, “Future City”, *New Left Review*, no. 21, (May/June 2003). Retrieved on 15/02/2022 from: <https://newleftreview.org/issues/ii21/articles/fredric-jameson-future-city>.

5 Jacques Ellul, *The Technological System* (New York: The Continuum Publishing Company, 1980).

societies, it does not necessarily follow that its halo effectively covers everything. It certainly doesn't cover the past. If we pay attention to the permanence in daily life of multiple practices and techniques linked to millennial cosmological visions, which are patently materialised in activities as basic as agriculture or food, we will realise that the pre-capitalist past continues to resist and persist to the onslaught of the univocal, linear, mono-technological and colonising *Gestell*.

An alternative notion of technics can be outlined based on the Mesoamerican techniques that were developed around the cultivation of maize. Through these techniques a different understanding of the concept of technology may be achieved, one that successfully escapes the monotecnological vision. This is the purpose of this work: to show, as a first suggestive sketch, the deep relationship that Mesoamerican cultures have with maize, which expresses a particular cosmotechnics that—in Hui's terms—manages to unify “the cosmic order and the moral order through technical activities”<sup>6</sup> in these societies, even up to the present; second, that the biological, agricultural and gastronomic techniques that have historically been woven around maize are an example of *technodiversity* that has persisted and relatively resisted the onslaught of capitalist logic; and, third, that this cosmotechnics has the potential to be configured as a cosmopolitics that revolves around the defence of native maize against the introduction of its transgenic equivalent, particularly if it manages to escape from identity politics and nationalist discourses.

## **2. On the Cosmological Importance of Maize in the Mesoamerican Peoples.**

Millenary sources of nutrients that have supported countless generations, and as an agglutinating symbol of the cosmological and socioeconomic orders in their different societies, maize could not have a greater fundamental and constitutive importance in Mesoamerican culture. As has been reflected in the vestiges found in the current territories of southern Mexico and Central America, maize was not only the basis of their diet and the centre of their economy, but it was also associated with a multiplicity of deities and rituals that functioned to order their worlds.<sup>7</sup> Despite the fact that maize began to be domesticated 9,000 years ago by pioneer emigrants from Asia, who arrived in the American continent during the Paleo-Indian period,<sup>8</sup> the first records that account for the cosmological importance

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6 Hui, *The Question Concerning Technology in China*, 20.

7 See: José Echeverría A. and Cristina Muñoz G., *Maíz: Regalo de los dioses* (Otavalo: Instituto Otavaleño de Antropología, 1988), especially Chapter 2; Michael Blake, *Maize for the Gods: Unearthing the 9,000-year history of corn* (Oakland: University of California Press: 2015), 36.

8 Yoshimiro Matsuoka *et al*, “A Single Domestication for Maize Shown by Multilocus Microsatellite Genotyping,” *Proceedings of the National Academy of Sciences* 99, no. 9 (April 2002): 1; Michelle C. Stitzer

of maize did not appear until the settlement of the Olmec culture in south-central Mexico more than 3,000 years ago through stone, wood and ceramic objects that were sculpted with discernible images of maize, from simple representations of ears of maize, to images that consisted of “much more abstract and powerful” representations of the Olmec maize god.<sup>9</sup>

The Olmec culture, credited with being the “mother culture” of the region, was not the only culture to represent maize in their utensils and attribute to it important religious symbolism. It would also not be the first Mesoamerican culture to create and worship a god represented by maize. The existence of a maize god in Mesoamerican cultures should, therefore, come as no surprise: maize was the source of meaning in Mesoamerica since, as the main food source of the region, it stood as the very principle of life and the basis of all social order.

This cosmology would also be reflected in those of the cultures that appeared later, such as the Maya and the Mexica, where the representations of maize multiplied and deepened in the course of subsequent centuries.

The maize plant was closely related to the structure of the universe and the four colours of the cereal were associated with the four cosmic directions. As early as the Olmec era (1200–400 bc), maize was deified at the various stages of the civilization’s development, and it has become integral to the Mesoamerican supernatural world. Iconographically in Olmec art, the maize god is represented with a spigot projecting from a hole in his front. Among the Classic Maya (250–900 ad), the rulers emphasized their relationships with this cereal and its supernatural personification, wearing an extremely long head coming out of corn leaves, in a reference to the shape of the corncob. The glyph *kan*, or corn grain, was often integrated into the head (Taube 1985, 1996, 2000). Finally, among the Mexica there were three deities associated with the plant: Xilonen (the goddess of sweetcorn), Cinteotl (the god of mature corn) and Chicomecóatl (Cinteotl’s female counterpart), also linked to the last stage of the development of cereal, as well as all other human maintenance foods, for example, beans, peppers and squash.<sup>10</sup>

Perhaps the most famous case that exemplifies the cosmogonic importance of maize is that of the Mayan culture, which makes this relationship explicit through a manuscript in the *Popol Wuj* or

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and Jeffrey Ross-Ibarra, “Maize domestication and gene interaction”, *New Phytologist*, no. 220 (2018): 396, doi: <https://doi.org/10.1111/nph.15350>.

9 Blake, *Maize for the Gods*, 193.

10 Natalia Moragas Segura and Elena Mazzetto, “Contexts of Offerings and Ritual Maize in the Pictographic Record in Central Mexico”, *Scripta Instituti Donneriano Aboensis* 26, (2015): 87–88.

*Popol Vuh*<sup>11</sup> [“Book of the Community”],<sup>12</sup> which narrates the founding myth of the K’iche’ people. This cosmogonical story narrates the creation of the Earth and of the human being, where maize plays a very important role. This story states that the Earth, animals and human beings were created by a group of gods after one night they joined “their words and their thoughts”. They first created the Earth, with its mountains, trees, and rivers; then they created the animals, ordered them to take care of the Earth and multiply, but they failed to make them speak and worship them, so they condemned them to become food. Therefore, they decided to try now to create “obedient, respectful beings that sustain and feed us”: human beings. The first human was created from earth, but they noticed that his body was soft and crumbling, they had no movement or strength, their vision was “veiled, he couldn’t see back,” and also, they could not walk or multiply. Then humans were created of wood, but they did not think or worship the gods, so the gods launched a flood to exterminate them. Finally, after an entire epic comparable to the ones narrated in Greek mythology, where the twin heroes Hunahpú and Ixbalanqué must descend into the underworld [Xibalbá] and overcome a series of tests, human beings were finally created from maize.

Maize certainly earns its place at the centre of the Mayan cosmology due to its nutritional importance. It was believed that the maize god was beheaded at the beginning of each harvesting season and then revived the following season. In this sense, the maize god represented fertility and seasonal cycles, which were also associated with human life cycles.<sup>13</sup> In this sense, human beings are conceived as descendants of maize.

Something similar happens in the Mexica cosmology, a society that settled in central Mexico in the 14<sup>th</sup> century, a couple of centuries before the arrival of the European conquerors, who also worshipped maize and even had gods that were identified with different stages of development of the plant.

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11 Anonymous, *Popol Vuh. Las Antiguas Historias del Quiché de Guatemala* (Bogotá: Panamericana Editorial, 1994).

12 According to Allen J. Christenson, the version that we know today of the *Popol Vuh* was written in latinized K’iche’ language by literate authors of the Mayan nobility in the 16<sup>th</sup> century, which was “discovered” 150 years later by the Dominican father Francisco Ximénez, who translated it into Spanish. There are those who question the accuracy of this translation because of the emphasis placed on the parallels with the Old Testament book of Genesis, as well as its possible use for evangelization. Although there are certainly archeological clues that confirm the stories of the *Popol Vuh*, Ximénez’s interference in the translation only shows the level of colonial penetration that even this type of texts holds today. See Allen J. Christenson, *Popol Vuh. Sacred Book of the Quiché Maya People* (Norman: University of Oklahoma Press, 2003) (Translator notes); and Gudrun Lenkersdorf, “El *Popol Vuh*: Algunas Consideraciones Históricas”, *Estudios de Cultura Maya* 24 (2003): 47–60.

13 See: Karl Andreas Taube, *Studies in Ancient Mesoamerican Art and Architecture. Volume 1* (San Francisco: Precolumbia Mesoweb Press, 2018).

The Mesoamerican cosmology was built for millennia around the plant par excellence: maize, which was often planted together with beans. The rhythms and the actors of the myths are interwoven with the agricultural cycle of maize. The same sacred calendar seems to be governed by the development of the plant, subjected in turn to the periods of nature, regulated by the earth's movement, which under the geocentric vision of primitive cultures is interpreted as a movement of the stars. Each stage in the life cycle of maize is governed by a different god: Tlaloc and Chalchiuhtlicue dominate the time to prepare the fields for planting, Xilonen is the goddess of the tender cob; Chicomecoatl, the god of ripe maize; Centeotl, Centeocihuatl or Imatecuhli are gods of the dry seed, and Tezcatlipoca, of the harvest.<sup>14</sup>

Mesoamerican religion organised the cosmos through maize, which served as a union on Earth of the underworld and heavenly dimensions. As Rubén Morante states, “stories like the *Legend of the Suns* [Mexica] and the *Popol Vuh* [Mayan] narrate the way in which the maize plant becomes the axis of the universe by linking its three planes and its four directions.”<sup>15</sup> But this religiosity around maize was not only a mythological story, but it also translated into daily food rituals or special occasions, such as offerings to the gods.

Many Mayan and Mixe-Zoquean rituals involve maize, whether as offerings, as instruments of divination, or as the ritual's objective. Rituals attending childbirth, planting, harvest, rain petitions, curing, new house construction, prayers for relatives, community renewals, death, and so on, are often called *costumbre* in Spanish. These rituals are invariably accompanied by formulaic discourse that we might label prayers, invocations, and incantations, and are frequently performed by specialists. Maize in the form of tortillas, tamales, or cornmeal is a frequent sacrificial offering on altars, in caves, on bodies of water, or at the foot of trailside crosses or shrines, for these are the places that can become portals to the other world where those to whom the petitions are made reside.<sup>16</sup>

As in any other culture, religion fulfils social and political functions and is expressed in rituals that order society and its values. Exchange was one of these rituals where maize enjoyed prominence. Maize offerings, as an exchange activity with the gods, embodies fundamental concepts of communal obligation and interaction.<sup>17</sup> Enrique Florescano explains, speaking about another Mesoamerican culture, the

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14 Rubén B. Morante López, “El Universo Mesoamericano. Conceptos Integradores”, *Desacatos*, no. 5 (Winter, 2000): 40. My translation.

15 López, “El Universo Mesoamericano,” 40.

16 Brian Stross, “Maize in Word and Image in Southeastern Meosamerica”, in *Histories of Maize*, ed. John Staller, Robert Tykot and Bruce Benz (San Diego: Elsevier, 2006), 586.

17 Christopher Morehart and Noah Butler, “Ritual exchange and the fourth obligation: ancient Maya

Mayan, how the agriculture and processing of maize implied a communal task linked to the cycles of nature and its religious significance:

The theogony, myths, rites, religious imagery, public art, and politics of the Mayans came together to make the god of maize a mirror of the people's virtues. He was the generator god of human existence, the founder of the sedentary town and the benefactor of the arts and sciences. He had the status of the ever-young god whose body turned green every spring. He was a symbol of eternal life, and therefore the death and annual rebirth of the plant became a metaphor for the imperishable continuity of dynastic power.

The cultivation of maize was the task that united the diverse settlers in an enterprise of common survival. It involved collective work, unity, discipline, planning, and community collaboration. He originated the division of labor in the family cell and ordered the activities of the peasant community around the annual cycle of production and the agricultural calendar, which defined the main rites and ceremonies.<sup>18</sup>

Following Florescano, this religious and nutritional importance of maize also served as a symbol of legitimacy for the Olmec and Mayan rulers, as well as their cycles in power.

In Olmec sculpture, painting, and pottery, the ruler is the supreme manipulator and articulator of the forces of the cosmos and his image is joined or confused with that of god. When the grain, the cob or the symbols of the maize god appeared linked to the figure of the ruler, it meant that the ruler possessed the most valued riches and that he himself had become a precious being. The Mayans also transferred the germinal virtues of maize to their political leaders and linked the agricultural cycle with the symbols of the succession of power: just as the god of maize dies at harvest and is reborn at each sowing, royal blood was interpreted as the precious seed that linked the dead kings with their successors, ensuring the continuity of the royal lineage.<sup>19</sup>

This somewhat generalised view of Mesoamerican culture, as developed in this section, definitely does not do justice to the multiplicity of cosmologies that, although stemming from the same root, gradually

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food offering and the flexible materiality of ritual”, *The Journal of the Royal Anthropological Institute* 16, no. 3 (September 2010): 600.

18 Enrique Florescano, “Imágenes y Significados del Dios del Maíz”, in *Sin Maíz No Hay País*, ed. Gustavo Esteva and Catherine Marielle (Mexico City: Conaculta, 2003), 52; 53.

19 Florescano, “Imágenes y Significados del Dios del Maíz”, 54.

differentiated with the passage of time. In addition, its technical thinking, as well as its pre-Hispanic and post-Hispanic mutations, would have to be identified and traced among all these ancient cultures in order to define in a profound sense its implications. Having said that, the outline given above is perhaps enough to recognize that maize was a fundamental element of cultures that ordered both their cosmogonies and cosmologies, as well as their social, economic, and political implications. After the Spanish conquest, many of these beliefs and rituals disappeared or mutated. However, some continue to be present despite the establishment of the European-Christian culture in Mesoamerica. The same could also be said of the agricultural and gastronomic techniques related to maize that will be addressed in the next section.

### **3. From the Agricultural Techno-diversity of Maize to the Colonial Imposition of a Mono-technological Culture.**

Agriculture is one of the primary activities found at the origin and development of every civilization thanks to its ability to generate a surplus of food that allowed humans to form increasingly complex and stratified societies. The invention of agriculture can be explained, in the terms of Leroi-Gourhan,<sup>20</sup> as a *technical tendency* that universally developed independently in different regions. Mesoamerica was one of these regions, where it emerged thanks to the domestication and cultivation of endemic plants such as maize, beans and squash. Following the French archaeologist, the agricultural techniques that were invented in the region could be considered *technical facts* that emerged thanks to the natural and cultural constraints of the region. This distinction helps explain why certain types of tools and techniques were invented in some societies, and while they were not necessary in others. However, as Hui warns, we must go beyond that vision of univocal temporality that judges technological development in terms of progress or lethargy. Proof of the above is that some techniques that are considered modern had actually already existed, although in a rudimentary way, in the past. The same thing happens the other way around: technical progress is not linear, and many inventions that at one time are considered obsolete, can resurface, and be reinserted once again into societies.

The maize plant [*Zea Mays L*] that we know today comes from the domestication of another plant called *teosinte* [*teōcintli* or “grain of God” in Nahuatl]. Some researchers, such as Salvador Miranda Colín,<sup>21</sup> support the idea that the plant was domesticated independently in different areas of the region; in contrast, others, like Yoshihiro Matsuoka,<sup>22</sup> consider that domestication occurred uniquely in southern

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20 André Leroi-Gourhan, *Evolución y Técnica I. El Hombre y la Materia* (Madrid: Taurus, 1988), 24.

21 Salvador Miranda Colín, “El Origen Genético y Geográfico del Maíz (*Zea mays L*)”, in *Centli-Maíz*, ed. Abel Muñoz Orozco (Chapingo: Colegio de Postgraduados/UAM, 2003).

22 Matsuoka *et al*, “A Single Domestication for Maize,” 6083.

Mexico. Despite the above, there is consensus that maize is itself the result of a technical process of artificial selection, a cultigen, which could well be considered the product of an ancestral biotechnological process. This is one of the main arguments in the book *Disrupting Maize* by the Mexican philosopher Gabriela Méndez Cota,<sup>23</sup> who contrasts this selection process as a pioneering example of biotechnology that resulted in the individuation of maize with contemporary discourses around transgenics and biotechnology.

In addition to its cosmological importance, the farmers' relationship with maize is so deeply symbiotic in character that maize cannot even be reproduced without human assistance. As Yolotl González states: "Due to its peculiar conformation, maize cannot reproduce by itself: the female inflorescences, which when fertilised by pollen form the ears, are surrounded by a set of *bracts* (corn leaves) and prevent that the grain detaches from the *rachis* (cob), therefore it is not possible for the wind to scatter its seeds."<sup>24</sup>

The domestication of maize from the teosinte plant could be understood as an artificialization process that makes maize an abstract object. In *On the Mode of Existence of Technical Objects*,<sup>25</sup> Gilbert Simondon defines the evolution of technicity as a process that begins with a genesis and develops in a course that goes from abstraction to concretion. An abstract technical object is one in which its internal structures and processes do not intervene on each other but are independent of each other. On the other hand, a concrete technical object is an evolved object that tends "toward internal coherence, toward a closure of the system of causes and effects that exert themselves in a circular fashion within its bounds, and it moreover incorporates a part of the natural world that intervenes as a condition of functioning and is thus part of the system of causes and effects."<sup>26</sup>

While an abstract technical object constantly requires the hand of human beings in order to continue to exist, the concrete technical object resembles a natural object in the sense that it enjoys a certain autonomy with its environment and a resonance that causally contains its internal relationships. In concrete technical objects, each structure, process and effect supposes the others in a causal relationship where "each important item is so well connected to the others via reciprocal exchanges of energy

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23 Gabriela Méndez Cota, *Disrupting Maize: Food, Biotechnology and Nationalism in Contemporary Mexico* (Maryland: Rowman & Littlefield, 2016).

24 Yolotl González Torres, "Notas Sobre el Maíz entre los Indígenas Mesoamericanos Antiguos y Modernos", *Dimensión Antropológica* 41, no.14 (September/December 2007): 50. My translation.

25 Gilbert Simondon, *On the Mode of Existence of Technical Objects* (Minneapolis: Univocal, 2017).

26 Simondon, *On the Mode of Existence of Technical Objects*, 49.

that it cannot be anything other than what it is.”<sup>27</sup> What distinguishes these two types of objects is the degree of artificiality they possess: “the essential artificiality of an object resides in the fact that man must intervene to maintain the existence of this object by protecting it against the natural world, giving it a status of existence that stands apart.”<sup>28</sup> The abstract technical object has a greater degree of artificiality, while the concrete loses it as its autonomy increases.

Natural objects, such as the maize plant, can undergo a process of abstraction when they are artificialized, as happens with a flower that comes from a greenhouse:

Artificiality is not a characteristic denoting the fabricated origin of the object in opposition to spontaneous production in nature: artificiality is that which is internal to man’s artificializing action, whether this action intervenes on a natural object or on an entirely fabricated one; a flower, grown in a greenhouse, which yields only petals (a double flower) without being able to engender fruit, is the flower of an artificialized plant: man diverted the functions of this plant from their coherent fulfillment, to such an extent that it can no longer reproduce except through procedures such as grafting, requiring human intervention. Rendering a natural object artificial leads to the opposite results to that of technical concretization: the artificialized plant can only exist in a laboratory for plants, the greenhouse, with its complex system of thermal and hydraulic regulations. Its system of primitively coherent biological functions has opened up into functions that are independent of one another, and only become attached to one another through the gardeners’ care; its flowering has become a pure flowering, detached, anomic; the plant flowers until it is exhausted, without producing seeds. It loses its initial capacity of resistance against cold, drought, and sun; the regulations of the primitively natural object become the artificial regulations of the greenhouse. Artificialization is a process of abstraction within the artificialized object.<sup>29</sup>

This artificiality should not necessarily be understood as a deficiency of its being, nor the result of the unethical manipulation of a human being who believes himself to be the owner of nature. As already shown in the previous section, maize has a predominant role in Mesoamerican societies that at the same time manages to unite human beings in communion with their ecological and cosmological environments. In addition, this artificial abstraction of maize is complemented by the invention of concrete techniques and assemblages that allow its persistence. An example of the above is the *milpa*, an agroecosystem invented by Mesoamerican farmers in which maize is planted together with other plants

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27 Simondon, *On the Mode of Existence of Technical Objects*, 26.

28 Simondon, *On the Mode of Existence of Technical Objects*, 49.

29 Simondon, *On the Mode of Existence of Technical Objects*, 49.

such as beans and squash, thus generating a balanced and sustainable relationship of food production and where each element is inserted within the technical assembly influences the others symbiotically.

In the milpa each plant fulfills an ecological function. The maize-bean association is complementary, since the bean is a nitrogen-fixing plant that provides this nutrient to maize, and the maize stalk provides support to the bean that becomes entangled in it to support and grow. They are also complementary due to the nutrients they provide, particularly in terms of amino acids, which when combined in the traditional diet provide a fairly balanced diet. Squash planted in the plot between maize and beans limits weed development; with the shade of their large leaves attached to the ground they help to keep moisture. The consumption of the seeds, guides, flowers and tender or ripe fruits of the pumpkin provides carbohydrates, proteins, fat, vitamins and fiber. The chili, which is often sown in the cornfield, allows a better use of the space between plants, repels certain insects and provides many vitamins. In the Yucatecan milpas, certain areas within the milpa, with special soil, are chosen to plant tubers, vegetables, melon or watermelon.<sup>30</sup>

According to Jasmin Aguilar, Caterina Illsley and Catherine Marielle, the *milpa* is a sustainable model that manages to respect the diversity of species and its varieties; one that allows symbiotic interactions between plants, where “some provide support, others store soil moisture, some provide shade and control weeds, others serve as hosts for beneficial insects, others are repellent”,<sup>31</sup> where the growing space is optimally used vertically and horizontally and serves as a method that is beneficial to avoid pests and other risks to the climate.<sup>32</sup>

Thus seen, the *milpa* operates as a technical assembly, where different natural objects are related in a symbiotic ecosystem. Indeed, its importance was so great to Mesoamerican culture that, as Armando Bartra maintains, perhaps Mesoamericans, more than children of maize, are, in fact, “people of the milpa”.<sup>33</sup> In this sense, it is also an example of natural and ontologically rooted techno-diversity since it is a practice that unites the orders of the underworld and the celestial world on the Earth plane as well as their social, economic, and nutritional demands.

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30 Jasmin Aguilar, Catarina Illsley and Catherine Marielle, “Los Sistemas Agrícolas de Maíz y sus Procesos Técnicos”, in *Sin maíz no hay país* 85 (2003). My translation.

31 Aguilar, Illsley and Marielle “Los Sistemas Agrícolas de Maíz,” 85.

32 Aguilar, Illsley and Marielle, “Los Sistemas Agrícolas de Maíz,” 85; 86.

33 Armando Bartra, “Hacer milpa”, *Ciencias*, no. 92 (October-March 2009). Retrieved on 24/01/2021 from: <https://www.revistacienciasunam.com/es/41-revistas/revista-ciencias-92-93/214-hacer-milpa.html>, I take the quote from Méndez Cota, *Disrupting Maize*, 40.

Another example of Mesoamerican techno-diversity is the *chinampa*: a kind of floating garden where maize and other plants are grown. Shortly before the conquest, the Mexica had already refined the agricultural techniques of maize by inventing these new irrigation and cultivation mechanisms. It is said that, when the Spaniards arrived in Mexico, Lake Xochimilco was covered with chinampas. This rudimentary method of hydroponic cultivation made it possible to make maize production more efficient so as to supply food to one of the most populated societies of its time worldwide.

It has been estimated that upon the arrival of the Spaniards, the chinampas of the Valley of Mexico supplied one and a half million people, the largest human concentration in the world at that time. There is evidence that the chinampas produced four to five tons of maize per hectare. The chinampas were maintained through an efficient nutrient recycling and irrigation technique and were connected by a network of drainage, irrigation and navigation channels. A system of dams, dikes and aqueducts controlled the level of the lake, preventing floods, desiccation and salinization.<sup>34</sup>

The *chinampas* played an important role in Mexica society given their cultivation capacity, but they also maintained an order in the division of family labour that even persists to this day, although clearly in a minimal fraction of the territory that was previously used for it.

A great potential of the ancestral wisdom of the inhabitants of the area is recognized in the chinampas system, which is reflected in the forms of work organization, agricultural production practices and their relationship with their religious customs. In addition, it is considered that the chinampas show the complexity of relationships implicit in agricultural practices to take advantage of water, soil, organic waste and, with this, introduce polyculture of endemic species as a whole, to become a viability of local development and in a natural space that mitigates the effects of flood pollution in the southern part of the Federal District [Mexico City], since the chinampas system in Xochimilco represents an example of endemic, agricultural, and natural and cultural heritage biodiversity. However, it runs the risk of disappearing due to urban pressure.<sup>35</sup>

An important aspect that has not yet been mentioned is that maize cannot be consumed on its own, but

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34 Aguilar, Illsley and Marielle, “Los Sistemas Agrícolas de Maíz,” 90.

35 Emma González Carmona and Cynthia Itzel Torres Valladares, “La Sustentabilidad Agrícola de las Chinampas en el Valle De México: Caso Xochimilco”, *Revista Mexicana de Administración Agropecuaria* 24, (January–June 2014): 700.

must go through a *nixtamalization* process, which involves immersing it in an alkaline solution to eliminate its contaminants and make it edible and more nutritious. Although modern nixtamalization processes now use industrial machinery that allows large-scale production this alkaline solution process continues to be used today, under relatively the same ancestral principle, in the creation of tortillas and other dishes that continue to feed Mesoamericans (perhaps this constitutes the technical process that has most resisted the monotecnological attacks of capitalism). This can be demonstrated by taking a walk through the streets of Mexico, especially in the centre and south of the country, where maize, its gastronomical derivatives and its associated techniques, is present in the daily life of Mesoamericans: tortillas, tacos, quesadillas, esquites, tamales, pambazos, tlacoyos, pozol, tejuino, atole. All of these dishes continue to serve as a nutritional support for the majority of Mexicans, even despite the spread of wheat after the conquest.

However, not all techniques managed to persist in the same way. The arrival of the Spanish and the introduction of their agricultural techniques—which, in the words of María del Carmen Meza, stem from a “cosmology of the dry”<sup>36</sup>— radically transformed the dynamics of indigenous farming in the region. The new plants introduced by the Spanish, such as the aforementioned wheat, had no place in the cornfields, so ancestral cultivation of maize began to be displaced by European techniques. A clear example of this change was the introduction of plough animals. Since these species did not exist in Mesoamerica, there was no need for the wheel be invented,<sup>37</sup> a phenomenon that could also serve as a counterexample to Leroi-Gourhan’s concept of technical tendency. With the introduction of the plough, plants began to be placed individually in a cultivation system similar to horticulture. This also presented a new problem: grazing radically changed their environments, even completely destroying some ecosystems.<sup>38</sup>

Indiscriminate overgrazing wiped out vegetation, exposing the soil to erosion and disrupting the ecosystem and hydrological systems. In many cases, extensive cattle ranching forced the cornfields to move to land that livestock could not reach, such as the slopes, or to build fences around the cornfields. The effects of livestock farming are still felt today.<sup>39</sup>

As we see, during the history of the peoples of Mesoamerica, there have been particular agricultural

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36 See: María del Carmen Meza Aguilar, “El Ahuejote en la Restauración del Paisaje de Xochimilco”, *Bitácora Arquitectura*, no. 18 (2008): 51.

37 This does not mean that the abstract idea of the wheel did not exist, however, it only appears in Mesoamerica in figures that were apparently used as toys, but never as a technology used for agriculture.

38 Aguilar, Illsley and Marielle, “Los Sistemas Agrícolas de Maíz,” 96.

39 Aguilar, Illsley and Marielle, “Los Sistemas Agrícolas de Maíz,” 96; 97.

and gastronomic techniques that establish a relationship of continuity between nature–cosmos–technology–culture, a continuity disarticulated by the Christian-European worldview established since the conquest. Some of these techniques have survived to the present day, however, this does not mean that we should romantically advocate a return to an innocent primitive state, nor insert them into the identity policies and nationalist ideologies of the present. Instead, it is a matter of recognizing and reformulating these technical meanings in relation to their cosmologies in order to imagine and invent new worlds alien to the tendency of homogenization of modern technology.

#### **4. A Cosmotechinics of Maize beyond Nationalistic Discourses**

Yuk Hui proposes the concept of cosmotechnics to understand the scientific and technical thought that emerges under cosmological conditions that are expressed in the concrete relationships that human beings maintain with their environment.<sup>40</sup> If cosmotechnics, in Hui's words, unites the cosmic and moral orders through technical activities, then politics should always be understood within that same condition. There is no politics—or moral order—that escapes technics, and there is no technique that escapes a particular cosmology. In this sense, as Hui affirms in one of his articles, cosmopolitics must be understood as cosmotechnics.<sup>41</sup>

Evidently, Hui speaks from the Chinese perspective, which differs remarkably from the Mesoamerican in that the latter suffered a violent and forced process of cultural and cosmological hybridization after the Spanish colonisation that left a social and psychological trauma that lasts to this day. This forced dispossession, rather than identitarian or national, is ontological since it prevents us from identifying only pre-Hispanic Mesoamerican cultures as the sole origin of contemporary Mesoamerican societies and recognizing also the inescapable Spanish influence in our contemporary culture.

This trauma has served as a political flag to create an identity and national unity, at least in Mexico. In Mexico, the introduction of transgenic maize has been a subject of deep debate. Méndez Cota notes that the antagonism against biotechnology in Mexico is commonly expressed through the rejection of the genetic “contamination” of transgenic maize with Mexican species.<sup>42</sup> This is the position that the actual Mexican government holds, as stated by the current director of the National Council of Science and Technology, the biologist María Elena Álvarez-Buylla, who considers that transgenic corn hybrids

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40 Hui, *The Question Concerning Technology in China*, 18.

41 Hui, “Cosmotécnica como cosmopolítica”, in *Fragmentar el futuro*, (Buenos Aires: Caja Negra, 2020), 41–64. Also published before as “Cosmotechinics as Cosmopolitics”, *e-flux*, no. 86 (November 2017).

42 Gabriela Méndez Cota, *Disrupting Maize*, 1.

could threaten the delicate harmonic balance of their environments, generating weeds resistant to pests or due to the possibility:

that the genes of the bioreactor maize escape that express inedible substances such as anticoagulants, drugs and other types of industrial chemicals that, if they penetrate the productive and nutritional network of maize, would cancel their vocation and could not eat more. This is plausible because there is a risk of gene flow from the experimental open field crops of these developments to the maize stocks exported by the US to our country.<sup>43</sup>

The transgenic modification of maize in recent decades not only abstracts the plant as a natural object, preventing its own reproduction, but also creates seeds that expire after a few generations and result in the privatisation of plant life. However, this privatisation of the maize plant, a product of modern biotechnology framed within capitalist utilitarian logic, has effects that go beyond the biological realm and that also disrupts a relationship of profound social importance related to the cosmological status of the plant.

This contamination is also a cultural ghost that points to the history of miscegenation in the country and to the “indigenistic” turn that, encouraged by identity and nationalist discourses, wove post-revolutionary Mexico after centuries of stigma around maize. Méndez Cota summarises this story in the first chapter of her book:

Since the defeat of the Aztec Empire by the Spaniards (1519–1521), throughout the colonial centuries of New Spain (1535–1821), and for most of Mexico’s national history (1821–present), maize bore a stigma of defeat. As the European staple, wheat, became a sign of superior status in New Spain, Catholic evangelization of indigenous people included constant encouragement to replace maize with wheat, the only authorized grain for the holy communion, and wheat farms employing forced labor served in fact as the foundation for colonial usurpation of indigenous lands in Mesoamerica. After the first colonial century, nine out of every ten people in New Spain had died due to the negative impact of the conquest on the indigenous population’s capacity to produce its own food. Those who survived did so largely because, by contrast with European wheat agriculture and stockbreeding, maize cultivation and consumption does not require complex equipment or too much space. Following independence from Spain in 1821, Mexican Creole elites defined national culture in strictly European terms. All maize products were

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43 Patricia Muñetón Pérez, “La Importancia de Proteger al Maíz como un Bien Común. Entrevista con la Dra. Elena Álvarez-Buylla Rocas, Jefa del Departamento de Ecología Funcional del Instituto de Ecología de la UNAM”, *Revista Digital Universitaria* 10, no. 4, (April 2009): 4.

excluded from the national cuisine, reflecting the continuing exclusion of the lower classes, particularly individuals of indigenous descent, from citizenship. Such an association of maize with racialized poverty was rearticulated toward the end of the nineteenth century in response to the troubling developments in European scientific discourse. Against social Darwinism, which postulated a biological inferiority of non-European populations, nationalist intellectuals argued that the real cause of Mexican “backwardness” was nutritional rather than hereditary and stemmed from the population’s consumption of maize.<sup>27</sup> Taking heed of these ideas, dictator Porfirio Díaz (1876–1911) launched a series of campaigns to educate poor women about the importance, for national progress, of eating wheat bread instead of maize tortillas. Maize thus became a target for modern state biopolitics, a scientifically oriented regime that seeks to exert “a positive influence on life, that endeavors to administer, optimize, and multiply it, subjecting it to precise controls and comprehensive regulations.”<sup>28</sup> The biopolitical attempt to replace maize with wheat lasted well beyond the Mexican Revolution (1910–1921), a bloody civil war that put an end to Díaz’s regime. The winning factions of this war set out to rebuild the Mexican nation around a cultural politics called “revolutionary nationalism.” Revolutionary elites used cultural nationalism as a way to create consensus around an imperative to modernize through industrialization and urbanization, neither of which could be achieved if the vast majority of the people lived and worked in small, isolated communities.<sup>44</sup>

The result of this history was the adoption of nationalism as a political method of modernization in rural areas of the country. The modern unilateral development discourse was thus embedded in the logic of the Mexican rulers, the majority coming from a single party that, on the one hand, defended a form of nationalist protectionism, and, on the other, began to adopt neoliberal policies and globalised market opening at the second half of the past century, up to the adoption of the first Free Trade Agreement between the North American countries in the nineties that opened the doors for the United States to export its maize to Mexico. Despite being the historical centre of this plant, Mexico currently imports almost half of the maize consumed.

But nationalist and identity discourses run the risk of obscuring, on the one hand, ancestral biotechnological practices that became maize and that reflect the possibility of generating cosmologically rooted biotechnologies; and, on the other hand, they ignore the complex state, inescapably globalised, where maize production is inserted at the present time.

Scholars have examined biotechnology debates in Mexico from a variety of social science

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44 Méndez Cota, *Disrupting Maize*, 22; 23.

perspectives; yet the cultural politics of such debates often appears underanalyzed, either taken for granted or mystified. “Culture” only makes itself present in assertions about a particular identity, as in “Mexicans are a people of corn,” implying that corn, like cultural identity, is a sort of possession that must be kept and celebrated as it faces outside threats such as modern biotechnology. As in “culturalist” anthropology, the defense of maize frequently presents Mexico as a unity made up of different civilizatory orders, which is problematic from several points of view.<sup>45</sup>

In the future, perhaps not too far away, it will be necessary to introduce methods and techniques that allow the production of the corn necessary to feed the growing Mesoamerican population. But the problem is certainly not reduced to biotechnological innovations, nor to the threat of a transgenic “monster” that must certainly be examined very carefully, but to the modern monotecnological framework that imposes a homogeneous and standardised way of deploying technics that subordinates scientific knowledge to capital and that, furthermore, ends up economically benefiting only a few private hands at the cost of eliminating the cosmological relations of the human being with his environment.

The search for a Mesoamerican cosmotechnics does not mean a naive and romanticised return to ancestral techniques, something that would surely be impossible given the current natural, social, and economic conditions of the region. Nor does it mean reducing the necessary defence of maize and its derived cosmological orders within the nationalist discourses that, at least in Mexico, were used to legitimise a hegemonic party that would come to govern for more than 70 years. Similarly, identity politics that use maize as a symbol of unity only serve to configure a Europeanized politics where, in Schmittian terms, anything Other is constructed as an enemy. On the other hand, the political dimension of the concept of cosmotechnics helps us escape from the synchronous temporal linearity marked by modernity, where we all experience the same homogeneous way of practising the technique, and it allows us to draw up a multiplicity of alternatives where it is possible to re-appropriate modern techniques from a position that eliminates the discontinuity between nature, culture, cosmology, and technology. Each cosmology, each metaphysics rooted in a culture, each imagination that is projected into the future is capable of constructing worlds, forms of knowledge, and ways of exerting technicity that do not necessarily have to be embedded in the monotecnological enframing of the univocal *telos* of the *Gestell*. We must prevent capitalism from also subduing the past. On the contrary: to escape the apparent apocalypse of the present, it is necessary to rescue the past as a cosmological source of future technological innovation.

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45 Méndez Cota, *Disrupting Maize*, 40; 41.

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