

July: Maize

La Guelaguetza, Mexico

MAIZE...Source of life or weapon of destruction?

On two consecutive Mondays at the end of this month, in the Mexican state of Oaxaca, thousands of people will take part in a celebration that honours the plant that has nourished Mexicans for many thousand of years.

The Festival of Guelaguetza is today a colourful pageant of dancing, singing and music in which participants from the seven different regions of Oaxaca gather in the capital (of the same name) and in nearby villages, to perform in traditional dress, present & exchange regional foods and crafts and at the end of the dancing throw offerings from each region (from straw hats to pineapples) into the waiting crowd. (1,2)

The best known indigenous gathering of its kind in Mexico, the festival has become (since its reorganization in the 1920s into a state-wide event) a major tourist attraction, but it still has deep cultural significance to Oaxaca's large and hugely diverse indigenous population.(3)

The plant that lies at the heart of the festival is maize (corn), but the event is about more than just this plant. The word 'guelaguetza' comes from the Zapotec Indian language (Zapotec and Mixtec peoples make up the majority of Oaxaca's indigenous population) and means a gift or offering.(2) But it also includes the concept of exchange and reciprocity - the interconnectedness between people which reinforces social ties, and the bond between people and the earth - that has shaped and is still central to indigenous cultures all over the Americas.

By the time the Spanish arrived there, maize had already become a hugely important crop across the continent, from Canada to Chile. (4) However, archaeobotanical studies indicate that the plant was domesticated in Mexico, in Oaxaca's Tehuacan valley, and that it has been grown in the south-western lowlands for almost 9,000 years. (5) This area is then, enormously important as the crop's centre of origin and genetic diversity containing the early forms of the crop as well as its wild relatives.

Tolerant of a range of climatic and other environmental conditions, maize has been grown traditionally by small-scale farmers, alongside beans (for which it provides support and whose roots deliver nitrogen via nitrogen-fixing bacteria) as well as squash, a plant which gives important ground cover, suppressing weeds and slowing evaporation by providing shade.

The scientific name chosen by Linnaeus "Zea mays", reflects the huge importance of maize as a food plant: Zea from the Greek, meaning 'cause of life' and 'mays' from the word for the plant in Taino (the language spoken by native peoples of the Caribbean at the time of the Spanish conquest), meaning also 'our mother'.

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The following description (6), by Claire Hope Cummings, summarizes the significance of maize to indigenous people:

‘Traditional native peoples of the Americas, past and present, view corn as a regenerative force that constantly reconnects them to the cycle of life and death, to their land, and to their communities. The ancient Maya considered themselves – as do their descendants today – to be a people who are made of corn. Corn is central to many contemporary native cultures in the Americas, and their corn creation myths offer some intriguing stories about its origins. Some of these stories are strikingly similar, with various versions telling how corn was given to humans as a gift from a divine source, usually in response to some need or severe hunger. But always, the gift of corn came with strict instructions about human responsibilities and the reciprocal efforts that would be required to ensure its constant replenishment’

Maize was the most important of the many other crops, including sweet potatoes, tomatoes and chillies – grown in all parts of their empire by the Aztecs (a term which refers to several ethnic groups of central Mexico) and was central to their diet. It’s not surprising then that maize had come to be regarded by them as sacred and that a corn goddess ‘Centeotl’ (or ‘Cinteotl’) – one of the most important deities of the Aztec era – was worshipped in its honour.

Every year at the height of the rainy season, in mid-July, the peoples of Oaxaca gathered to honour and pay homage to Centeotl, making offerings which they hoped would ensure a bountiful harvest in the coming year. Objecting to such ‘pagan’ behaviour and in an attempt to stop it the Catholic church promoted the feast day of the ‘Virgen del Carmen’ – held on 16th July – instead. (2,3) But as is the case with many other ancient customs elsewhere in Latin America, the Spanish didn’t quite achieve their goal, and the present festival is the result of a combination of both Hispanic and pre-Hispanic traditions.

In today’s Geulaguetza a young woman is chosen to represent Centeotl. However, she’s selected not for her appearance but for the knowledge she has about her community’s traditions. This will of course include the use and cultivation of maize, and all that the plant represents.

‘In the Sierra Norte the farmers take their reciprocal responsibility to corn seriously. Roberto Gonzalez, anthropologist and author of Zapotec Science: Farming and Food in the Northern Sierra of Oaxaca, says it is common for people here to say, “Maize has a heart” ...This saying has some biological accuracy. Corn kernels do have a nucleus or heart, from which the seeds germinate. But, Gonzalez says, the villagers use the term “heart” in the moral sense, as they view corn as “a wonderful plant-person with a long memory, a strict moral code, and an unshakeable will”. He is emphatic that corn always “prescribes reciprocity”. In areas where there are constant land conflicts, for instance, this reciprocity provides a means of binding communities together through market transactions, cultural traditions, and seed exchanges. “Thus maize is not only an economic good but a medium through which certain social and moral obligations and responsibilities, particularly reciprocity (toward kin, neighbours, poorer villagers, and people in neighbouring villages) must be met”.

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The Zapotec communities ... understand that if they maintain corn, it will maintain them. To the Zapotec, the concept ofmaintenance, which includes responsibility and reciprocity, is crucial. The Zapotec have a system of community work responsibility ... Reciprocity is also part of ... a mutual aid arrangement whereby favours and services are freely exchanged. This system underlies the practise of saving seed and exchanging corn seed, which is essential for preserving corn's genetic diversity.'(6)

At this year's Guelaguetza festival, Centeotl's representative should then be all too aware of the devastating effects the North American Free Trade Agreement (NAFTA) has had on the cultivation and consumption of maize by Mexico's rural and urban poor, and of the critical struggle now taking place to stop the Mexican government from caving in to pressure to allow genetically modified maize to be grown here.

Free Trade?

The manipulation of maize for the economic interests of the USA has been a disaster for Mexicans in more ways than one. And the method of and reason for its cultivation here in the UK may well spell disaster for us too, though in a different way – in time.

The NAFTA agreement came into effect on the 1st January 1994 and removed the barriers to trade between Mexico, Canada and the USA, creating the world's largest free trade area. As a result, maize that was being produced much more cheaply in the USA due to huge subsidies (reported to have increased by 300% since the agreement was signed), drastically undercut the price of the maize being produced in Mexico. The country became, essentially, a 'dumping ground' for American maize and a dramatic decline in domestic production ensued. (8)

This has had several catastrophic effects. One of these is the massive migration of Mexicans who were previously small-scale farmers (the majority of Mexico's agricultural sector) no longer able to make a living by growing and selling maize, to the USA, looking for work. There are now nearly 12 million Mexican immigrants living (or subsisting) in the USA. (9)

Anthony Bradley of the Acton Institute, writes that these poor migrant and seasonal workers suffer extremely poor health and many chronic conditions apart from malnutrition, and reports that they are sick and dying because:

'politicians create perverse and immoral incentives by interfering with the market. Ignoring the dignity of Mexican workers and the common good, they instead pander to a powerful special interest group, the corn lobby' (7)

It is, Bradley says, because of these corn subsidies, that that American government is:

'morally culpable for the oppression, dehumanization and poor health of Mexican migrant workers'. (7)

The tragic irony is that many will end up working in maize production in the USA, so helping to perpetuate the influx of cheap maize to Mexico which has caused such harm.

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To make matters worse, for those left at home financial speculation has resulted in hugely inflated prices being passed on to the poor. The buying and selling of futures contracts in the USA and Europe by traders with no interest in agriculture or food has caused sudden increases in the international trading price of maize, destabilizing the market and exaggerating 'normal' fluctuations in food prices. And this has resulted in millions of people, who would otherwise have eaten tortillas (an everyday ritual for most Mexicans, some 53 million of whom - that's about 45% of the entire population - live at or below the poverty line on less than \$5 a day) (10) and for whom eating corn tortillas accounted for nearly half their daily average calorie intake, being obliged to eat cheaper and much less nutritious imported food.

Mexico now imports 42% of its food from the USA. (11) According to official figures (12) 'consumer-ready food products' made up some 39% of 'agricultural' exports to Mexico from the USA in 2012, which were worth US\$18.9 billion - a new record high. The top processed foods exported to Mexico included:

'red meats and poultry, sweetener, concentrated milk, fats and oils, red meat offal, oilseed flour, cheese, beans and lentils, flavorings, soup and chocolate candy'. (12)

No wonder then, that there is a huge obesity problem in Mexico and that Mexicans are now the most over-weight people in the world (13)

I should explain here that maize of two major kinds is consumed in Mexico. The maize that is eaten in food like tortillas and tacos - by people - is 'white maize'. 'Yellow maize' however, is fed to livestock (as it is here) and is therefore mostly imported from the USA to feed animals that will support Mexico's growing meat consumption. About one third of this maize is now imported into Mexico, making this country in 2012 the 2nd largest importer of maize in the world (14) (white maize too, needs to be imported if yields are low and this commodity falls prey too, to a speculative market).

It was against this background situation that over 300 local and indigenous farmers, plus civil, human rights, and environmental organizations came together in 2007 to launch the national campaign 'Sin Maiz, No Hay Pais' (Without maize, there's no country). The idea was to draw attention to the crisis the whole farming system was going through and demand that the government stop ignoring the problems of small farmers. (15)

Genetically engineering disaster

Amongst these problems there's the issue of the historic 'accidental' contamination of Mexico's native maize with GM maize and the on-going battle now being waged to stop the Mexican government from allowing GM maize to be sold for planting.

In 2001 David Quist and Ignacio Chapela, made the alarming discovery that transgenic DNA was present in ancient cultivated varieties of 'criollo' or native maize growing in a remote region of Oaxaca state. (16) In 2002, the Mexican government confirmed that as much as 95% of the maize fields in the states of both Oaxaca and Puebla contained evidence of GM contamination, where, in some fields, up to 10% of plants were affected. (17)

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The obvious source of this contamination was maize imported from the USA, (courtesy of the NAFTA agreement) the genetically modified proportion of which has been rapidly increasing: by 2012 88% of all the maize grown in the USA was GM. (18)

The discovery in Oaxaca, unsurprisingly, caused much anger and alarm. The early forms of maize here are the product of an immensely long interaction between people and their environment, resulting in plants with many different traits, which can for example, tolerate many different soils and microclimates. As such, although they surely belong to the farmers who have nurtured and grown them for centuries, they represent in scientific terms a treasure chest of genes, a living gene bank, that may help future plant breeders fulfil agricultural and nutritional needs. Scientists are concerned that if the artificial genes persist they could contaminate and perhaps destroy the natural genetic base of maize, one of the world's most important food crops. Once released, gmos are beyond human control – invisible and difficult to detect.

There is a huge body of information about the corporate motives for and the social and environmental implications and repercussions of the cultivation of gm food crops around the world (19) – and this issue goes beyond the scope of this short article. In brief, however, some of the dangers include:

The fact that farmers must enter into contracts with agrochemical companies who prohibit them from saving seeds;

The fact that GM seeds producers become the owners of those seeds and can take legal action against small farmers whose own seeds end up contaminated with transgenic material;

Unknown health effects for those who consume them;

The poisoning of beneficial insects;

The development of insect pests or weeds resistant to the chemicals used on gmos; and

The creation of new weedy crop relatives that are hard to control.

You get the feeling that this all might have been planned – that the intention was there long ago, on the part of the biotech companies, to completely undermine Mexico's self-sufficiency and in effect, reduce the country to serfdom.

In July of last year a class-action lawsuit was filed by a collection of activist groups, spearheaded by Adelita San Vicente of the Seeds of Life Foundation, to stop the Mexican government from granting permits to allow agrochemical giants, Monsanto, DuPont Pioneer and Dow Agrosciences - who had lobbied for more than 10 years to do so - to plant 12 million has of GM maize.

Maize is particularly susceptible to GM contamination as the plant reproduces through 'open pollination'. Despite warnings that the plants would interbreed or outcompete native strains, as well as maize's ancestor 'teosinte', the Mexican government (which gave permission in 2010 for GM cotton and soya to be grown) had however, already allowed 'test planting' of GM maize from 2009. In September a judge ordered a stop to this 'experimental' growing and any commercial planting until a decision about safety is reached.

Across Europe campaigns to try and stop biotech countries have gained huge support: Earlier this year Avaaz launched its campaign to stop the 'Monsanto Frankenseed Factory' (22) in Cordoba, Argentina and in April the Monsanto vs Mother Earth campaign (23), called on the governments of Germany, France and the Netherlands and all contracting states of the European Patent Convention:

'to take the lead to fix European patent law by calling on the Administrative Council of the European Patent Organisation to close the loopholes that allow corporations to patent plant varieties and conventional breeding methods. Clear and effective safeguards and prohibitions are needed to protect consumers, farmers and breeders from the corporate takeover of our food chain.'

More recently Avaaz's has launched its 'Let's Build a Noah's Ark to Stop Monsanto' campaign with the following message:

The source of our planet's food is under threat. Ten agro-chemical firms own 73% of the commercial seed market, and as many as 93% of seed varieties have gone extinct. In the US alone 85% of apple varieties have disappeared.

Monsanto and co. are privatising the genesis of nature. And this corporate takeover is decimating sustainable farming, destroying the diversity of our crops, and making them vulnerable to diseases that could threaten our food security.

But farmers are resisting, saving seeds in banks and barns across the world. Now they have devised a revolutionary project -- the first ever, non-profit "eBay" of seed where any farmer, anywhere can source a wide variety of plants cheaper than the genetically modified seeds from chemical companies. This global online store could re-flood the market with all kinds of seeds and slowly break the monopoly that is putting our food future at risk!

This could be the most innovative agricultural idea in decades -- a Noah's Ark of seeds. But chemical companies often bully and sue those that get in their way, and farmers are calling on us to support them. If we raise enough now we can help them launch the online site, support seed storing in key countries, finance marketing and advertising, and fund the legal defence to fight back'.

The power of the GM companies, who in Mexico have support from both the world's richest man, Carlos Slim and the Gates Foundation, and who argue erroneously and emotively that GM crops are safe, without providing any evidence, and needed to feed to world's poor, should not be underestimated.

A strong movement has arisen in Mexico however, to challenge the GM companies and the government.

Scientist Vandana Shiva, who has spoken out with great authority and clarity for many years against the injustices and damage to people and the environment caused by genetically modified crops and whose Navdanya (19) movement launched its 'Global Citizens' Report:

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Seed Freedom' in 2012, travelled to Mexico last year to join Mexican farmers, indigenous leaders and environmentalists fighting to protect Mexico's corn varieties.

At the gathering held in Oaxaca in April she said, with regard to testing for the toxicity and allergenicity of GMO foods:

'All the tests they do for safety are not tests, because they work with surrogate proteins. They don't work with the transgene. ... They say this is natural. It is substantially equivalent to your corn and therefore we don't have to test it because it is equal ... They say it is just like nature, but when it comes to owning the seeds they say, "We are the creators. We made it, we are the inventors. We own it, we have the patent. It is our intellectual property". So the same thing is new, when it comes to owning, and it is natural when it comes to shedding responsibility for the environmental, health and socio-economic impacts. I call this ontological schizophrenia'. (21)

At the Mexican meeting Vandana Shiva referred to the global citizen's movement for seed freedom and the need to 'say no to transgenics, no to patents, no to Monsanto's empire to destroy the planet, and our lives and our food systems'. (21)

Ask the average person here in the UK, about maize and their knowledge is probably pretty sketchy. Which is surprising really, because we eat it (not just in cornflakes) or otherwise use it in a multitude of ways.

Maize starch in particular has come to play a major if unsuspected part in many of the products we consume. It's used as a thickener in a huge range of processed foods from sauces and soups to confectionery, and in the manufacture of pharmaceuticals, cosmetics and adhesives, and for cloth and paper size, as well as the glucose and fructose syrups with which many processed foods and drinks are sweetened. Then there's maize oil and maize gluten, and the fermentation and distillation of maize into drinks such as bourbon whiskey.

The fermentation of dextrose from maize meanwhile, has created a large group of bioproducts – from amino acids such as lysine (used as a supplement in animal feeds) to food gums such as xanthan gum.

And a vast array of non-edible products from biodegradable plastics to synthetic rubber can now all be made at least in part from processed maize.

Better known perhaps is that maize is used for ethanol production – as an additive to petrol – and as a feedstock for biogas plants and that this has generated an intense debate about how such usage can be justified with regard to the land that might otherwise be used for food production.

Here in the UK, a massive increase in maize cultivation has occurred in recent years as the crop has been selected to supply anaerobic digestion plants and is also being grown as a food for livestock.

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As George Monbiot has pointed out in his illuminating article 'Ripping Apart the Fabric of the Nation' (24) the way in which maize is being grown here is incompatible with the protection of the soil.

After deep ploughing, the ground is left bare for several months, creating 'a perfect formula for ripping the soil off the land' (24). Monbiot points out that erosion is occurring at an alarming rate and that one study in the south west of England suggests that the soil structure has collapsed in 75% of maize fields there. A study in Devon meanwhile, indicates that 5 tonnes per hectare may be being lost each year. There are several reasons for this, Monbiot explains, but he is sure that the problem has been made worse by the cultivation of maize. And of course, soil erosion and soil compaction are major contributors to flooding. In the next 6 years the National Farmers Union are however, hoping to increase cultivation by another 100,000 hectares – just for biogas production.

The recent scrapping of the European Soil Framework Directive – which though unenforced sought, at least on paper, to provide some means of protection for our soils – means that there is now nothing at all to stop our soils from disappearing as appropriate land use gives way to 'smash and grab' exploitation. Maize, Monbiot points out, is not the only culprit, but the increase in its cultivation, from just 1,400 has in 1970 to 160,000 has today, has exacerbated the problem.

Maize has become a monster, here in our midst.

If, as Claire Hope Cummings has written 'corn reflects the values of the people who grow it, (6) then there isn't much hope for any of us here in the UK. At least not until we re-learn the concept of reciprocal exchange - that you cannot take without giving something back, which lies at the heart of the ancient Geulaguetza celebration. It is perhaps, the only thing that will save us.

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