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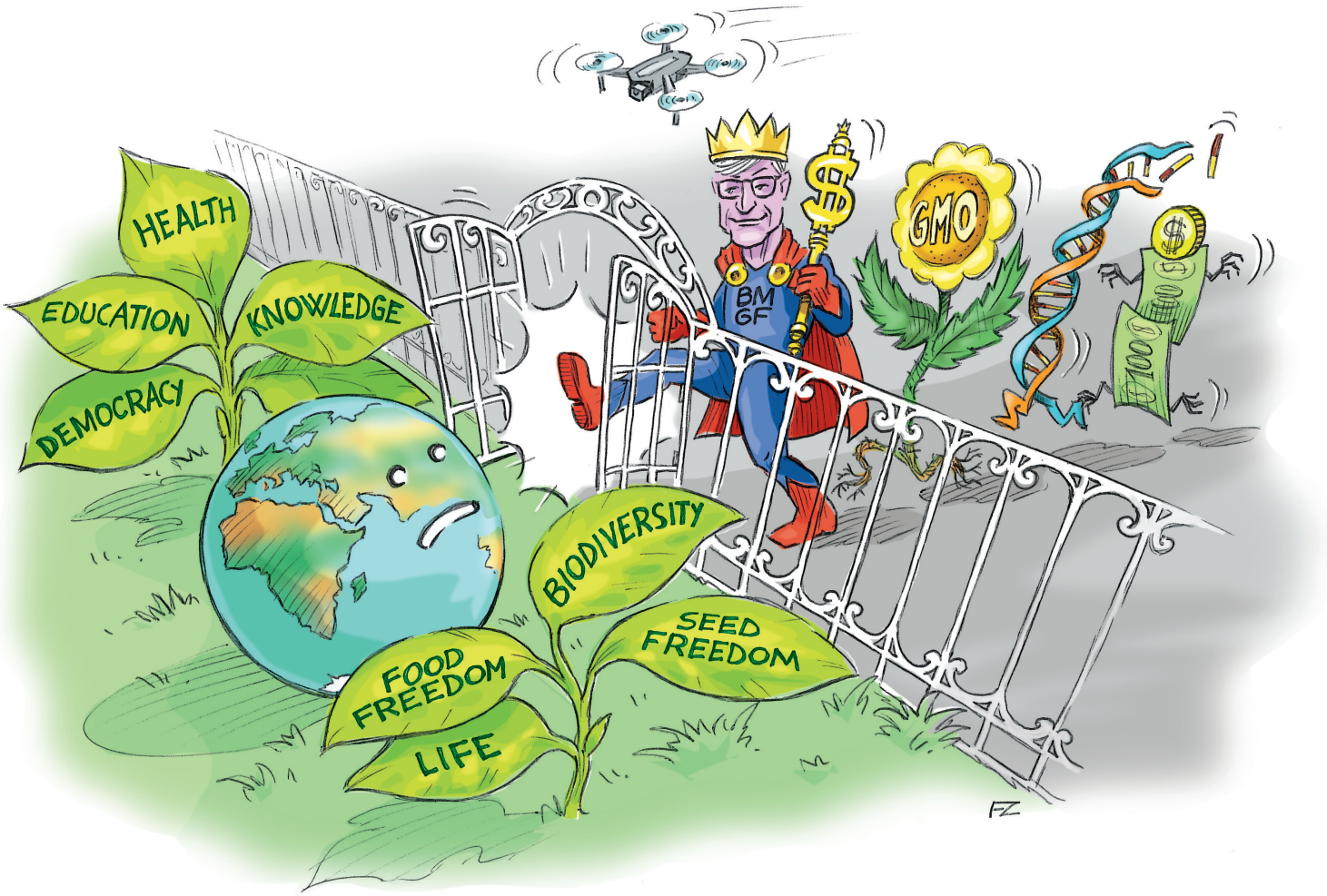
Gates to a Global Empire



OVER SEED, FOOD, HEALTH, KNOWLEDGE ...AND THE EARTH

A GLOBAL CITIZENS' REPORT

Coordinated by

Navdanya international

SECTION 6

ONE EMPIRE OVER THE EARTH: AMPLIFYING CLIMATE CHANGE, ACCELERATING THE SIXTH MASS EXTINCTION

THE SUGAR DADDY OF GEOENGINEERING: BILL GATES' FOSSIL FUEL INTERESTS AND FUNDING FOR GLOBAL CLIMATE ENGINEERING

Dru Jay and Silvia Ribeiro, ETC Group

Bill Gates' approach to our planet's climate is designed to appear sensible, even-handed, and evidence based. A closer look, however, reveals a powerful billionaire with a deep attachment to techno-solutions that don't interfere with the normal functioning of capitalism – and a large financial stake in the continued extraction of fossil fuels.

In a 2010 TED talk, Gates outlined, in carefully crafted messages, what he considered the most effective solutions to climate change[1]. His approach, titled "Innovating to Zero" centred on five "energy miracles" he believes the earth needs to avoid catastrophic temperature increases. In Gates' view, those technologies are carbon capture and storage, nuclear energy, wind power, solar power, and solar thermal.

Gates presents the technologies, noting the drawbacks and potential of each one. He makes a show of deferring to evidence and science in each case. This is typical of Gates' rhetoric. A posture of disinterested curiosity shows up in all his public appearances; it is effective and disarming.

As a sort of afterthought to the TED talk, Gates answers a question about solar geoengineering—the idea that engineers could block enough sunlight to offset global temperature increases—with a carefully-prepared answer and an elaborate metaphor:

> "If this doesn't work, then what? Do we have to start taking emergency measures to keep the temperature of the earth stable?"
>
> "Yeah, if you get into that situation—it's like, if you've been overeating and you're about to have a heart attack, then where do you go? You may need heart surgery or something. There is a line of research on what's called geoengineering, which are various techniques that would delay the heating to buy us 20 or 30 years to get our act together. Now that's just an insurance policy_you hope that you don't need to do that. Some people say you shouldn't even work on the insurance policy because it might make you lazy, that you'll keep eating because you know heart surgery will be there to save you. I'm not sure that's wise, given the importance of the problem. But now that the geoengineering discussion about 'should that be in the back pocket in case things happen faster or this innovation goes a lot slower than we expect'—…".

[1] "Innovating to Zero! | Bill Gates - YouTube." https://www.youtube.com/watch?v=JaF-fq2Zn7I

Perhaps disingenuously, Gates leaves the last sentence unfinished. At the time of the talk, Gates had already been funding geoengineering research with millions of dollars for several years.[2] Geoengineering refers, essentially, to attempts to stop global temperature increases by blocking the sun or sucking carbon out of the air on a massive, global scale—instead of reducing carbon emissions to zero. The potential risks run the gamut from unexpected feedback effects that destabilize the global climate, to droughts and floods in Africa and South America, to land grabs, ecological destabilization, ocean acidification, pollution and growing the political and financial power of the fossil fuel industry. This is a high risk strategy: the consequences we know about are massive, the ones that are unknown could be more so. The process could alter weather patterns locally, regionally and globally, with destabilising geopolitical impacts as well.

In fact, Gates has, through personal funding and investments, been one of the major backers of the most extreme forms of geoengineering research for more than a decade. Prominent geoengineers like Ken Caldeira and David Keith are among his close advisors, and his donations are supporting some of the most controversial proposed experiments.

Gates' heart attack metaphor is flawed in a number of ways. Unlike heart surgery, geoengineering has never been done before, and there is only one patient to try it out on: the planet. Geoengineering is more akin to administering a massive dose of a hypothetical, untested medication that one is certain will have permanent negative effects. In this metaphor, one is uncertain which effects will happen, but there is potential for organ failure, psychosis, or death. In the same way, geoengineering—if implemented—will have global effects covering a range of severity from destructive to fatal, from unanticipated climate destabilization to continental crop failures. The problem is that we don't know which one will happen, and the only way to properly "research" the question is to take that one shot.

Gates' engineering-for-everything mentality and his preference for purely technological solutions are well-known. And like many billionaires, Gates has a blind spot when it comes to questioning the logic of capitalism. Nearly every solution Gates proposes for the climate centres on "innovation" by entrepreneurs, driven by the promise of profits.

But hidden behind Gates' carefully cultivated persona of detached curiosity on climate solutions are significant financial interests in fossil fuel extraction.

For example, at the time of his 2010 TED Talk, Gates had already been a major shareholder in Canadian National (CN) Railroads for at least four years. CN was—and is—making big profits by shipping crude oil from Canada's tar sands to market. Rapidly-expanding tar sands extraction has been stymied by a number of campaigns led by Indigenous communities and climate activists to stop construction and expansion of pipelines. In this context, Canada's railroads (of

[2] *The Planet Remade: How Geoengineering Could Change the World*, by Oliver Morton (2015), page 102

which CN is one of two major operators) have become an alternative oil pipeline, shipping over 400,000 barrels per day in January 2020[3]. For comparison purposes, the Trans-Mountain Pipeline that Canada's government is attempting to expand currently has a capacity of 300,000 barrels per day.

"Tar sands, Alberta (2008)", by Dru Oja Jay, Dominion, is licensed under CC BY 2.0 (https://creativecommons.org/licenses/by/2.0/).

Tar sands operations are among the dirtiest and most environmentally destructive forms of fossil fuel extraction. In some cases, the land is strip mined to remove the bituminous sand below. The 2013 explosion of an oil train killed 42 people in Quebec[4]. In the aftermath, despite posting record profits, CN has pushed its workers to work longer hours and dismissed safety concerns from union representatives[5].

Since 2011, Gates has been the single largest shareholder in CN, and his holdings have increased over time. Through Cascadia Investment Fund[6], which he controls, and through the Bill and Melinda Gates Foundation, he has gradually

[3] "Crude-by-Rail Shipments Hit Record High over 400,000 Bpd in January." *630CHED*. https://globalnews.ca/news/6708937/crude-by-rail-shipments-hit-record-high-over-400000-bpd-in-january/

[4] "Lac-Mégantic Rail Disaster." *Wikipedia*, July 25, 2020. https://en.wikipedia.org/w/index.php?title=Lac-M%C3%A9gantic_rail_disaster&oldid=969494782

[5] "Federal Govt. Should Respect Labour Rights in CN Strike | National Union of Public and General Employees." https://nupge.ca/content/federal-govt-should-respect-labour-rights-cn-strike

[6] "Cascade Investment." *Wikipedia*, June 16, 2020. https://en.wikipedia.org/w/index.php?title=Cascade_Investment&oldid=962804357

increased his holdings of CN stock to 16.7% of the company[7]. That means that in 2019, Gates' Cascadia and the Foundation received[8] around US$190 million in dividends alone.[9] Steep growth[10] in oil-by-rail exports has accounted for the company's record-high profits and steady profit growth[11].

Though Gates has sold a lot of his holdings in Microsoft, he still owns about US$70 billion in stock of the now-US$1 trillion company. Microsoft has invested heavily in pursuing oil giants, signing deals with Exxon Mobil, Chevron, Shell, and BP[12]. Despite a recent pledge to be "carbon negative by 2030," the company's cloud services web site advertises "oil and gas solutions" that will "increase drilling hit rates," "improve reservoir production" and "extend asset life cycles[13]." In other words, they're helping oil companies extract more oil, at a time when we should be doing anything but. (And according to a former employee, Microsoft allegedly also helped oil companies to conduct surveillance of their workers[14]).

Gates is not a disinterested observer seeking solutions to the climate crisis. In addition to being a billionaire who made his fortune skirting government regulations and dominating competitors with monopolistic practices, he holds a very significant financial stake in the continued expansion of the fossil fuel industry. His shares in CN Rail alone are worth US$10.9 billion.[15]

If the planet stays within what scientists say is our maximum "carbon budget," oil companies will see vast assets disappear from their balance sheets – estimated at between $1 trillion and $4 trillion. This is the "carbon bubble."[16]

Geoengineering is the fossil fuel industry's final escape hatch—its only chance to keep on extracting and burning in order to recuperate some of those US$1.6 trillion in soon-to-be stranded assets.

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[7] "CNI - Canadian National Railway Co Shareholders - CNNMoney.Com." https://money.cnn.com/quote/shareholders/shareholders.html?symb=CNI&subView=institutional

[8] "CNR Dividend Yield, History & Payout Ratio (Canadian National Railway)." https://www.marketbeat.com/stocks/TSE/CNR/dividend/

[9] Cascadia holds 101,400,770 shares; Bill and Melinda Gates Foundation holds 17,126,874 shares, for a total of 118,527,644 shares. At an annual dividend of CAD$2.19 per share, that's around US$190 million (based on conversion rates of July 15, 2020).

[10] Government of Canada, National Energy Board. "NEB – Canadian Crude Oil Exports by Rail – Monthly Data." Last modified August 21, 2020. https://www.cer-rec.gc.ca/nrg/sttstc/crdlndptrlmprdct/stt/cndncrdlxprtsrl-eng.html

[11] "Crude-by-Rail and Container Traffic Push CN Rail to Record Revenues of Nearly $4B." *Global News*. https://globalnews.ca/news/5675640/record-cn-revenues-crude-by-rail/

[12] "Microsoft's Climate Bullshit | REDD-Monitor." https://redd-monitor.org/2020/03/29/microsofts-climate-bullshit/

[13] "Azure for Energy | Microsoft Azure." https://azure.microsoft.com/en-ca/industries/energy/

[14] Wood, Charlie. "An Anonymous Microsoft Engineer Appears to Have Written a Chilling Account of How Big Oil Might Use Tech to Track Its Workers' Every Move." *Business Insider*. https://www.businessinsider.com/microsoft-engineer-says-big-oil-surveilling-oil-workers-using-tech-2019-11

[15] 118,527,644 shares at a value of CAD$125.06 is CAD$14.8 billion, or US$10.9 billion (based on share prices and conversion rates of July 15, 2020).

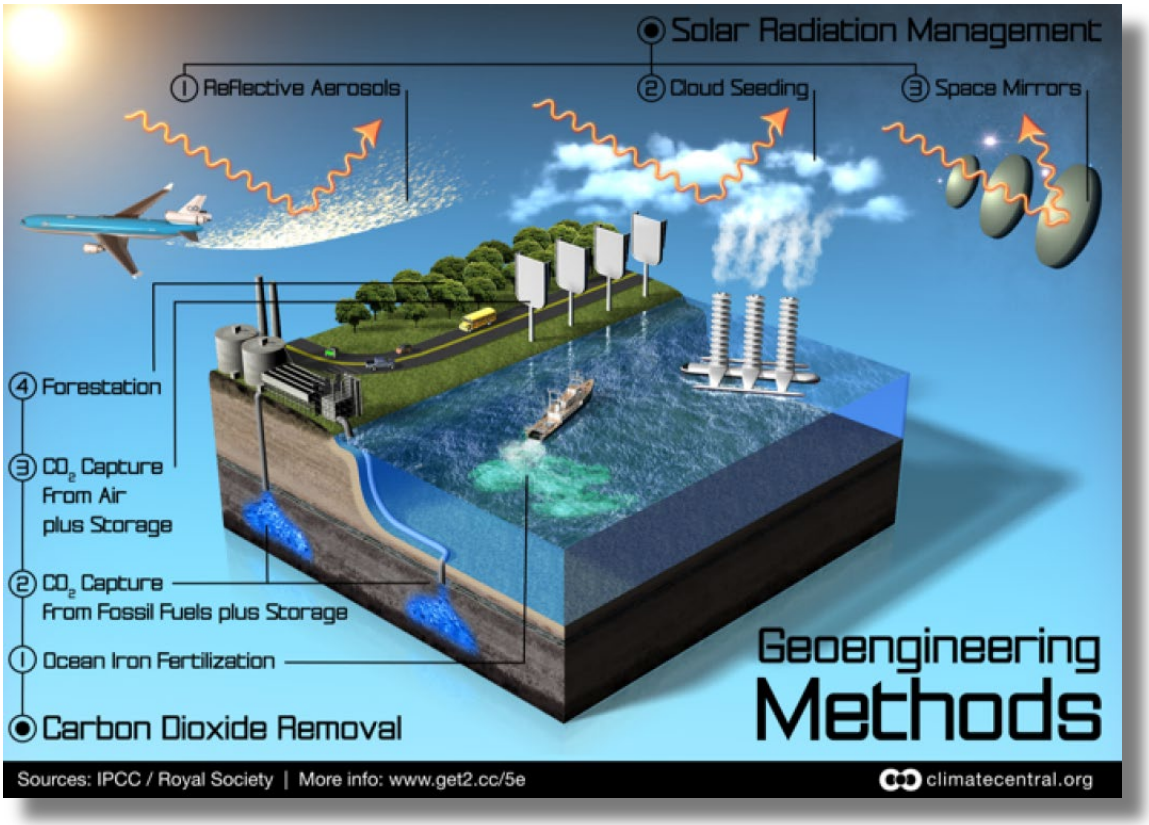
[16] Fiona Harvey Environment correspondent, "What Is the Carbon Bubble and What Will Happen If It Bursts?" *The Guardian*, June 4, 2018, sec. Environment. https://www.theguardian.com/environment/2018/jun/04/what-is-the-carbon-bubble-and-what-will-happen-if-it-bursts

According to a report from CIEL, since the 1970s, oil companies have been investing in and supporting geoengineering[17]. However, they have kept a lower profile when it comes to more extreme forms of solar geoengineering (i.e. blocking sunlight).

Into this void has stepped Bill Gates, who's carefully cultivated philanthropic image appears to be a relative public relations coup for the fossil fuel players who would like to drive geoengineering but can't show their faces.

Climate geoengineering refers to large-scale human intervention in the climate, and it includes projects that could alter marine and terrestrial ecosystems and atmosphere.

Geoengineers have divided these into two major categories: carbon dioxide removal (the idea of removing CO_2 from the air on a massive, global scale, which appears on Gates' list of "miracle" technologies) and solar geoengineering (the idea of blocking a portion of sunlight to temporarily cool the planet).



Carbon Dioxide Removal (CDR) proposals are the more mainstream of the two; there are dozens of research projects running around the world but so far they either haven't proven that they can remove any CO_2, or only that they remove currently tiny amounts of CO_2 from the air – while being too energy-intensive and

[17] "Fuel to the Fire: How Geoengineering Threatens to Entrench Fossil Fuels and Accelerate the Climate Crisis (Feb 2019)." *Center for International Environmental Law*, n.d. https://www.ciel.org/reports/fuel-to-the-fire-how-geoengineering-threatens-to-entrench-fossil-fuels-and-accelerate-the-climate-crisis-feb-2019/

expensive to make sense. Their proponents speculate, however, that they will eventually remove billions of tonnes per year from the atmosphere, either storing it underground or using it to produce synthetic fuels (in which case it ends up in the atmosphere again).

Direct Air Capture (DAC) is a form of CDR where fans suck in vast amounts of air, push it through substances that absorb carbon dioxide molecules, and then process the substances to remove the carbon. The processes of removing the carbon require high heat, and thus large amounts of energy.

Bio-Energy with Carbon Capture and Storage (BECCS) is another form of CDR. It involves growing biomass (e.g. wood), burning it in a power plant, capturing the carbon (using a similar process to DAC) before it enters the atmosphere, and then storing it underground. In theory, carbon is thus removed from the atmosphere by plant growth, and kept out when it is buried. However, many questions have been raised about the full-life-cycle impacts of BECCS, as it would demand millions of hectares of land (by one estimate the equivalent of the entire landmass of India). Its land and water needs would severely compete with food production, and devastate ecosystems. Though it has been discredited in many climate circles, it persists as a policy idea and has been prominently featured by the Intergovernmental Panel on Climate Change (IPCC) in its Fifth Assessment Report.

Carbon Capture and Storage (which generally refers to capturing carbon before it is emitted) is on Gates' list of "miracle" technologies that need to be developed. It's also at the top of oil companies' wishlists. The top investors in CCS technologies have been oil companies, who own much of the intellectual property around related techniques. Microsoft's plan to achieve "net zero" emissions lean heavily on unidentified carbon removal techniques to offset the company's fossil fuel use[18].

Along with tar sands billionaire N. Murray Edwards and Chevron, Gates is a major investor in Carbon Engineering, a Canada-based Direct Air Capture firm. CE's founder and chief scientist David Keith, a Gates advisor since the mid-2000s, is at the centre of what journalist Eli Kintisch called the "geoclique"—a small group of people who are driving geoengineering[19].

There are some – including the IPCC – who don't consider carbon dioxide removal to be geoengineering. If, however, these projects were to reach the proposed scale, in order to really influence the climate, the impacts would be global and profoundly negative. Many CDR proposals require massive amounts of energy to function, and its rapid growth could slow the climate transition. It also requires massive infrastructure, and some forms (e.g. Bio-Energy with Carbon Capture and Storage, or BECCS) require land covering the equivalent of several

[18] "Microsoft Will Be Carbon Negative by 2030." *The Official Microsoft Blog*. Last modified January 16, 2020. https://blogs.microsoft.com/blog/2020/01/16/microsoft-will-be-carbon-negative-by-2030/
[19] Hamilton, Clive. "The Clique That Is Trying to Frame the Global Geoengineering Debate | Clive Hamilton." *The Guardian*. Last modified December 5, 2011. http://www.theguardian.com/environment/2011/dec/05/clique-geoengineering-debate

countries. Storage of billions of tonnes of carbon raises major questions about leaks, pollution, and the massive infrastructure required.

Keith is also the most well known advocate for solar geoengineering, a term that covers various efforts to block sunlight from reaching earth or reflect it back into space on a massive scale. Along with Ken Caldeira, he manages the Fund for Innovative Climate and Energy Research (FICER)[20]. Gates had given FICER at least US$4.6 million as of 2012, and further donations are unknown, though the web site notes that research grants come from "Bill Gates from his personal funds" (i.e. not the Bill and Melinda Gates Foundation).

For years, FICER was the main source of financing for research related to solar geoengineering. Two of the North American solar geoengineering projects that are closest to testing—Keith's SCoPEx, and the California-based Marine Cloud Brightening Project—have received funding from FICER. According to a 2012 *Guardian* report[21], about half of FICER's funding was then going to Caldeira and Keith's projects, but it had also funded an initiative to advance governance of solar geoengineering (SRMGI)[22], and contributed to a Novim report on geoengineering, which was convened by Dr. Steven E. Koonin, Chief Scientist for multinational oil and gas company BP[23].

Keith's current research project is the Stratospheric Controlled Perturbation Experiment (SCoPEx), an attempt to conduct an open-air test of solar geoengineering technology by spraying various substances into the stratosphere from a balloon. The experiment has been repeatedly delayed, but if it moves forward, it would be a violation of the provisions of the moratorium on geoengineering passed by the 196 countries who are party to the United Nations Convention on Biodiversity.

In his book *The Planet Remade*, journalist Oliver Morton calls Gates the *"sugar daddy" of geoengineering (p. 156)* and concludes that

> *"Keith and Caldeira would have been leaders in the field based on their work but having this fund at their disposal gave them extra heft. It has allowed them to support work that would otherwise not have been supported, and create space for discussions that might otherwise not have taken place."* (p. 157)

Because changing the amount of sunlight that reaches earth is so dangerous and difficult to understand without doing it at scale and over a long period of time, solar geoengineering has received less mainstream discussion—for

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[20] "Fund for Innovative Climate and Energy Research." https://keith.seas.harvard.edu/FICER

[21] Vidal, John, environment editor. "Bill Gates Backs Climate Scientists Lobbying for Large-Scale Geoengineering." *The Guardian*, February 6, 2012, sec. Environment. https://www.theguardian.com/environment/2012/feb/06/bill-gates-climate-scientists-geoengineering

[22] "SRMGI – Solar Radiation Management Governance Initiative Is an International, NGO-Driven Project That Seeks to Expand the Global Conversation around the Governance of SRM Geoengineering Research," n.d. https://www.srmgi.org/

[23] Blackstock, J. J., D. S. Battisti, K. Caldeira, D. M. Eardley, J. I. Katz, D. W. Keith, A. A. N. Patrinos, D. P. Schrag, R. H. Socolow, and S. E. Koonin. "Climate Engineering Responses to Climate Emergencies." *arXiv:0907.5140 [physics]* (July 31, 2009). http://arxiv.org/abs/0907.5140

now. Few open-air tests of solar geoengineering have been announced. Of those announced, most have been cancelled or delayed after opposition and protests.

David Keith's favoured proposal is to spray tens of thousands of tonnes of aerosols, potentially sulphur dioxide, into the stratosphere, blocking sunlight before it reaches the earth. Keith, who according to the same *Guardian* report, received direct annual funding from Gates circa 2012, wrote a book advocating for solar geoengineering. He took a strategy of embracing the shocking nature of spraying tens of thousands of tonnes of "*sulphuric acid*" into the stratosphere, defending the position that "*we need to talk about it*". He even allowed himself to be the butt of several cruel jokes on the satirical show the Colbert Report in order to convey his ideas, which he describes as a last resort if other climate strategies fall through[24].

Another one of Gates' connections to geoengineering stretches back to 1986, when Nathan Myrhvold joined Microsoft when his company was acquired by Gates' software giant. Myhrvold was a close collaborator for 14 years. "*I don't know anyone I would say is smarter than Nathan,*" Gates told a reporter in the 1990s. "*He stands out even in the Microsoft environment.*" Myhrvold is also a geoengineering enthusiast, and a proponent of injecting the stratosphere with sulphur dioxide.

Myhrvold reportedly took Bill Gates and Warren Buffet on a tour of Canada's tar sands mining operations[25]. One of the byproducts of tar sands processing is vast quantities of sulphur, which is stored in giant yellow pyramids outside of the Syncrude refinery, viewable from the highway. Myhrvold marvelled at the possibilities of burning that sulphur to make sulphur dioxide, and pumping it into the stratosphere via a hose suspended from a series of balloons.

"*So you can put one little pumping facility up there,*" Myrhvold enthused, "*and with one corner of one of those sulfur Mountains, you control the whole global warming problem for the Northern Hemisphere.*" That idea forms the basis for "Stratoshield," a project of Myhrvold's Intellectual Ventures, an investment fund that seeks to profit from inventions that anticipate trends and future developments. The Stratoshield consists of a very long hose—30 kilometres long—stretching from the ground to the stratosphere with balloons, each of which houses a small pumping station that would keep a steady stream of sulphur dioxide flowing into the sky. A "*string of pearls,*" in Myhrvold's words, that would "*spritz the stratosphere with a fine mist,*" a veil of 100,000 tonnes per year of sulphur dioxide that would encircle the planet.

Who is behind the "Stratoshield"? It's unclear, but FICER co-director Ken Caldeira works as an "inventor" for Intellectual Ventures and has co-authored a

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[24] "David Keith - The Colbert Report (Video Clip)." *Comedy Central*. http://www.cc.com/video-playlists/kw3fj0/the-opposition-with-jordan-klepper-welcome-to-the-opposition-w--jordan-klepper/lv0hd2

[25] "Superfreakonomics: Everything You Know about Global Warming Is Wrong." *Carolina Huddle*. https://www.carolinahuddle.com/boards/topic/34241-superfreakonomics-everything-you-know-about-global-warming-is-wrong/

paper with Myhrvold[26]. Caldeira has also speculated publicly that a government of a "vulnerable country" like Bangladesh could unilaterally implement solar geoengineering[27]. In addition to the stratospheric shield, Intellectual Ventures has also proposed weather modification technology using ocean cooling[28].

In a chapter of the book *Superfreakonomics*, which sold over 7 million copies, Myrhvold discusses climate at length with the authors, and makes the case for injecting sulphur into the stratosphere. After quoting Myhrvold for several pages on the theme of "*Everything you know about Global Warming is wrong,*"[29] the authors reach the conclusion that reducing carbon emissions doesn't make sense. Spending money on "*anti-carbon initiatives, without thinking things through*" would be "*a huge drag on the world economy.*" What *would* work?. "*Once you eliminate the moralism and the angst,*" the authors say about Myhrvold's "Stratoshield" plan, "*the task of reversing global warming boils down to a straightforward engineering problem.*"

Gates, who is still close with Myhrvold, has invested in Intellectual Ventures, which includes "Stratoshield" under its umbrella of inventions. He and Myhrvold appear to share the view that capitalism is the main force that will lift—and has lifted—the poor people of the world out of poverty[30].

Myhrvold later backtracked and denied portraying solar geoengineering as a solution. He now opts for the more politically correct "it's a last resort" approach.

The "last resort" rhetoric echoes how Gates talks on the rare occasions when he speaks about his support for geoengineering. But the facts outlines here—the much more aggressive pro-geoengineering stance portrayed in Superfreakonomics, coupled with Myhrvold's proximity to Gates, and Gates' investments in transportation of tar sands oil— raise significant questions about Gates' real privately-held views about geoengineering technologies, and what is driving his investments in them.

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[26] "Not Only Is the Warming Hiding in the Ocean, It's Hiding in the Future Too." *Watts Up With That?* Last modified October 1, 2013. https://wattsupwiththat.com/2013/09/30/not-only-is-the-warming-hiding-in-the-ocean-its-hiding-in-the-future-too/

[27] "What If the Most Vulnerable Nations Decided to Hack the Climate?" *Undark Magazine*. Last modified July 18, 2016. https://undark.org/2016/07/18/plan-b-for-bangladesh-geoengineering-climate-change/

[28] "Climate Science » Intellectual Ventures Lab." Last modified March 11, 2013. https://web.archive.org/web/20130311145011/http:/intellectualventureslab.com/?page_id=258

[29] Ibid.em

[30] Gates, Bill. "Is There a Crisis in Capitalism?" *Gatesnotes.Com*. https://www.gatesnotes.com/Books/The-Future-of-Capitalism

DRIVEN TO EXTERMINATE: HOW BILL GATES BROUGHT GENE DRIVE EXTINCTION TECHNOLOGY INTO THE WORLD

Zahra Moloo and Jim Thomas, ETC Group

In 2016, at the Forbes 400 Summit on Philanthropy in New York, Bill Gates was asked to give his opinion on gene drives, a risky and controversial new technology that could—by design—lead to the complete extermination of the malaria-carrying mosquito species, *Anopheles gambiae*. If it were his decision to wipe out this mosquito once and for all, given the risks and benefits being considered, would he be ready to do it? "I would deploy it two years from now," he replied confidently. However, he added, "How we get approval is pretty open ended."

Gates's 'let's deploy it' response may not seem out of character, but it was an unusually gung-ho response given how risky the technology is widely acknowledged to be. Gene drives have been dubbed an "extinction technology" and with good reason: gene drive organisms are created by genetically engineering a living organism with a particular trait, and then modifying the organism's reproductive system in order to always force the modified gene onto future generations, spreading the trait throughout the entire population.

In the case of the *Anopheles gambiae* project (that Gates bankrolls), a gene drive is designed[1] to interfere with the fertility of the mosquito: essential genes for fertility would be removed, preventing the mosquitoes from having female offspring or from having offspring altogether. These modified mosquitoes would then pass on their genes to a high percentage of their offspring, spreading auto-extinction genes throughout the population. In time, the entire species would in effect be completely eliminated[2].

Although still new and unproven, gene drives have provoked significant alarm among ecologists, biosafety experts and civil society, many of whom have backed a call for a complete moratorium on the technology. By deliberately harnessing the spread of engineered genes to alter entire populations, gene drives turn on its head the usual imperative to try to contain and prevent engineered genes from contaminating and disrupting ecosystems. The underlying genetic engineering technology is unpredictable and may provoke spread of intended traits. The notion that a species can be removed from an ecosystem without provoking a set of negative impacts on food webs and ecosystem functions is wishful thinking and even taking out a carrier of an unpleasant parasite does not mean the parasite won't just jump to a different host. Moreover, the implicit power in being able to re-model or delete entire species and ecosystems from the

[1] "Self-Sustaining." *Target Malaria | Our Work*. https://targetmalaria.org/our-work/self-sustaining/
[2] Dunning, Hayley . "Malaria Mosquitoes Eliminated in Lab by Creating All-Male Populations." *Imperial College London | News*, May 11, 2020. https://www.imperial.ac.uk/news/197394/malaria-mosquitoes-eliminated-creating-all-male-populations/

genetic level up is attracting the interest of militarities and agribusiness alike and runs counter to the idea of working with nature to manage conservation and agriculture.

That Gates is so enthusiastic about releasing this powerful genetic technology is not so surprising when one scratches the surface of the myriad institutions that have been researching and promoting gene drives for years. To date, the Bill and Melinda Gates Foundation (BMGF) is either the first or second largest funder[3] of gene drive research (alongside the shadowy U.S. Defense Advanced Research Projects Agency (DARPA) whose exact level of investment is disputed[4]). Gates is not just another tech optimist standing on a business stage calling for gene drive release to be allowed—his foundation has poured millions of dollars into gene drive research for over a decade. Yet direct research funding is not the only way in which the BMGF has accelerated the development of this technology. They have also funded and influenced lobbyists, regulators, and public narratives around gene drives, in an attempt to push this dangerous sci-fi sounding technology into real world use, shifting research priorities on industrial agriculture, conservation and health strategies along the way.

Funding the Research

While the controversy around gene drives is recent, promoters like to emphasize that research towards creating gene drive technology has been in the works for many years. From its inception, much of this research has received direct funding from the BMGF, funneled through different academic institutions. The beginning of current research into genetically modified extinction technology can be traced back to 2003 when Austin Burt, a professor of Evolutionary Genetics at Imperial College in London, was working with yeast enzymes, noting how 'selfish genes' were able to reproduce with a greater probability than the usual 50-50 ratio that occurs in normal sexual reproduction. In a paper, he explained how these genes could be adapted for other uses, such as in mosquitoes, where the destruction of the insects could be embedded directly into their genes. Burt, along with Andrea Crisanti, another biologist at Imperial College, applied for a US$8.5 million grant from the Bill and Melinda Gates Foundation (which they received in 2005) to take forward their theories and apply them in a lab, eventually creating an international project called 'Target Malaria'. In an interview with Wired magazine[5], Crisanti explained how this funding and the relationship with the BMGF was instrumental in the further development of gene drives technology. "If you need a resource, you get it, if you need a technology, you get it, if you need equipment, you get it. We were left with the notion that success is only up to us," he said.

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[3] Regalado, Antonio. "Bill Gates Is Betting Big on a Technology That Could Make Mosquitoes Extinct." *Business Insider | MIT Technology Review* , September 7, 2016. https://www.businessinsider.com/bill-gates-foundation-gene-drive-kill-mosquitoes-2016-9

[4] "Gene Drive Files Expose Leading Role of US Military in Gene Drive Development." *Gene Drive Files | Synbiowatch.* Ref. 3. http://genedrivefiles.synbiowatch.org/2017/12/01/us-military-gene-drive-development/#3

[5] O'Mahony, Jennifer. "Science Moves Closer to Killing Malaria with Mutant Mosquitos." *Wired UK*, n.d. https://www.wired.co.uk/article/mosquito-gene-drive-malaria

At the same time, in 2005, the BMGF was also channeling money into the Foundation for the National Institutes of Health (FNIH), as part of a larger US$436 million grant for a project called the Grand Challenges in Global Health Initiative. Through the FNIH, a biologist at UC Irvine, Anthony James, was injecting DNA into mosquito embryos[6] to create transgenic mosquitoes resistant to dengue fever. These mosquitoes were able to reproduce which meant that normal mosquito populations could possibly be replaced by GM mosquitoes if only a way could be found to drive the engineered genes into populations. In 2011, James' lab genetically engineered the mosquito species *Anopheles stephensi* with genes that made it resistant to malaria.

All these developments were significant, but they had not yet led to the creation of gene drives. That moment came in 2015, when two scientists at UC San Diego, California, Ethan Bier and Valentino Gantz, created a gene-construct that could spread a trait through fruit flies, turning the entire population yellow. The technology they had developed used a new genetic engineering tool called CRISPR-Cas9 which could cut DNA and enable genes to be inserted, replaced or deleted from DNA sequences[7]. In effect Gantz and Bier built the genetic engineering tool directly into the flies' genome so each generation genetically engineered its offspring. CRISPR-Cas9 technology was instrumental in the creation of the gene drive and in late 2015, functional gene drive modified mosquitoes

[6] University of California - Irvine. "Genetically Engineered Mosquitoes Show Resistance To Dengue Fever Virus." *ScienceDaily*, March 10, 2006.
https://www.sciencedaily.com/releases/2006/03/060308213147.htm
[7] Esvelt KM, Smidler AL, Catteruccia F, Church GM. Concerning RNA-guided gene drives for the alteration of wild populations. Elife. 2014;3 pii:e03401 10.7554/eLife.0340.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4117217/

were created. This is what the Gates Foundation was waiting for. In 2016, an official with the Gates Foundation said in an interview that malaria could not be wiped out without a gene drive; all of a sudden this 'extinction technology' was considered not just desirable, but "necessary" in the fight to end malaria.

Since then, the push for further research and deployment of gene drives has gained considerable momentum—mostly propelled by Gates dollars. The BMGF has funneled even more funding into taking gene drive research forward. In 2017, UC Irvine received another US$2 million directly from the BMGF for Anthony James to genetically engineer the malaria-carrying mosquito species *Anopheles gambiae*, with a view to eventually releasing them in a trial[8]. Meanwhile, Target Malaria, the flagship research consortium that came from Burt and Crisanti's work, has received US$75 million from the foundation[9]. This has been used to create labs in Burkina Faso, Mali and Uganda in order to begin experimenting with gene drives in Africa, and in 2019 Target Malaria released 4,000 genetically modified (not gene drive) mosquitoes in Burkina Faso as a first step in their experiment. Their goal is to release the gene drive mosquitoes in Burkina Faso in 2024. BMGF has also bankrolled further gene drive research in Siena Italy, Jerusalem, Israel and Boston, USA[10].

Synthetic Biology and Agricultural Interests

Although mainstream media coverage of gene drive developments emphasizes Gates's grandiose philanthropic intentions in eliminating malaria and saving lives in Africa, there is more than meets the eye when it comes to Gates's direct funding of gene drive research.

Gene drives are classified as part of a controversial field of extreme genetic engineering known as synthetic biology (synbio) or 'GMO 2.0' in which living organisms can be redesigned in the lab to have new abilities[11]. Synthetic Biology aims to redesign and fabricate biological components and systems that do not exist in the natural world[12]. Today it is a multi-billion-dollar industry which creates compounds like synthetic ingredients (synthetic versions of saffron, vanilla etc), medicines and lab-grown food products. Gates's ambitions for this radical biotech field extend beyond gene drives and malaria research and into the field of synbio. In an interview, he said that if he were a teenager today, he would be hacking biology: "If you want to change the world in some big way, that's where you

[8] Perkes, Courtney . "UCI Mosquito Project Receives $2 Million from Gates Foundation to Fight Malaria." *Orange County Register*, May 10, 2017. https://www.ocregister.com/2017/05/09/uci-mosquito-project-receives-2-million-from-gates-foundation-to-fight-malaria/

[9] Kotecki, Peter. "Mosquito-Borne Diseases Kill Millions of People Each Year. A Team of Scientists Think Genetic Manipulation Could Wipe out the Worst of Them." *Business Insider*, January 16, 2019. https://www.businessinsider.com/target-malaria-wants-to-end-mosquito-borne-disease-using-gene-drives-2019-1

[10] "Search Results 'Gene Drive.'" *Bill & Melinda Gates Foundation*. https://www.gatesfoundation.org/search#q/k=%22gene%20drive%22

[11] Thomas, Jim. "What Is Synthetic Biology?" ETC Group, n.d. https://www.etcgroup.org/sites/www.etcgroup.org/files/files/synbio_comics-complete_letter_size_rev.pdf

[12] "Synthetic Biology Explained." *Biotechnology Innovation Organization*. https://www.bio.org/articles/synthetic-biology-explained

should start—biological molecules."[13]

The Gates Foundation has had a substantial influence on the synthetic biology industry since its inception. In 2005, when the field was still relatively new, the BMGF gave a grant of US$42.5 million (and later more) to the University of California Berkeley and Amyris, a startup synbio company, in order to produce the antimalarial drug artemisinin in a laboratory with genetically engineered microbes[14]. The aim of this grant was not only to create the antimalarial drug, but also to create new biofuels, medicines and high value chemicals. The founder of Amyris, Jay Keasling, has told ETC Group that the Gates funds were contingent on finding other more profitable lines of business in addition to artemisinin and so initially the technology was simultaneously applied to biofuel production. Jack Newman, a scientist at Amyris explained that "the very same pathways" used in artemisinin "can be used for anticancer (drugs), antivirals, antioxidants."[15]

While using philanthropic funds to bankroll a private biofuel business might seem ethically questionable, the supposedly beneficial target of making an antimalarial molecule may not have been so positive either. In 2013, after many years of research by the UC Berkeley Laboratory and Amyris, it was announced that the French pharmaceutical company, Sanofi, would launch the production of synthetic artemisinin[16]. Commercial production of the compound was hailed as more affordable than naturally grown artemisinin, which is farmed in countries like Kenya, Tanzania, Madagascar, Mozambique, India, Vietnam and China. However, what was not mentioned during all the hype around the synthetic production of the compound was that artemisinin farmers in these countries would lose their livelihoods as a result of the sale of the synbio version[17]. In the hype and supported by philanthropic money, prices for artemisinin crashed and some natural artemisinin extractors were shuttered. Eventually, even the synthetic product proved too expensive to sell[18].

The BMGF investments' in syn bio go further still. The Foundation invested in a number of other synbio companies including Editas Medicine, a genome editing company that controls the CRISPR-Cas9 technology behind gene drives, and Ginkgo Bioworks, which creates microbes for application in fashion, medicine and

[13] Levy, Steven. "Geek Power: Steven Levy Revisits Tech Titans, Hackers, Idealists." *Wired*, April 19, 2010. https://www.wired.com/2010/04/ff_hackers/5/
[14] Kanellos, Michael. "Gates Foundation to Promote Synthetic Biology." *CNET*. Last modified November 12, 2005. https://www.cnet.com/news/gates-foundation-to-promote-synthetic-biology/
[15]Kanellos, Michael. "Gates Foundation to Promote Synthetic Biology." *ZDNet*. Last modified November 18, 2005. https://www.zdnet.com/article/gates-foundation-to-promote-synthetic-biology/
[16] Sanders, Robert. "Launch of Antimalarial Drug a Triumph for UC Berkeley, Synthetic Biology." *Berkeley News*, April 11, 2013. https://news.berkeley.edu/2013/04/11/launch-of-antimalarial-drug-a-triumph-for-uc-berkeley-synthetic-biology/
[17] Thomas, Jim. "Synthetic Anti-Malaria Compound Is Bad News for Artemisia Farmers | Jim Thomas." *The Guardian*, April 12, 2013. http://www.theguardian.com/global-development/poverty-matters/2013/apr/12/synthetic-malaria-compound-artemisia-farmers
[18] Peplow, Mark. "Synthetic Biology's First Malaria Drug Meets Market Resistance." *Nature News* 530, no. 7591 (February 23, 2016): 389. https://www.nature.com/news/synthetic-biology-s-first-malaria-drug-meets-market-resistance-1.19426

industry[19]. Gates is also keen on the so-called "cellular food revolution" which grows food from cells in a lab. His investments in the sector include Memphis Meat, a company that creates cell-based meat without animals, Pivot Bio, which creates engineered microbes for use in agriculture, and Impossible Foods, which makes processed meat-like burgers from a synthetic biology-derived blood substitute.

That Gates is pouring so much money into an industry that is oriented toward shifting agriculture and the food systems toward hi-tech approaches is no accident, given how influential the Foundation is in global health and agriculture policy generally, and in promoting industrial agriculture in the global South and especially Africa. In the case of gene drives, while most international debate has focused on their application in malaria and conservation, the industrial farm is where gene drives may first make their impact[20]; the very foundational patents for gene drives have been written with agricultural applications in mind. In 2017, a secretive group of military advisors known as the JASON Group produced a classified study on gene drives commissioned by the US government which was tasked to address "what might be realizable in the next 3-10 years, especially with regard to agricultural applications." The JASON Group was also informed by gene drive researchers who were present during a presentation on crop science and gene drives delivered by someone from Bayer-Monsanto. Other groups involved in gene drive discussions behind the scene include Cibus, an agricultural biotech firm, as well as agribusiness majors including Syngenta and Corteva Agriscience.

The startup Agragene, whose co-founders are none other than the gene drive researchers Ethan Bier and Valentino Gantz of University of California at San Diego, "intends to alter plants and insects" using gene drives. The JASON Group and others have also raised the flag that gene drives have biowarfare potential—in part explaining the strong interest of US and other militaries in the technology.

Shaping the Narrative Around Gene Drives

Not only has the Gates Foundation funded the underlying tools of the synbio industry and moulded gene drive research for years, it has also been quietly working behind the scenes to influence the adoption of these risky technologies. The way in which policy and public relations about gene drives research has been shaped by the Foundation becomes clear when one examines what happened

[19] Cumbers, John. "Meet Eight Tech Titans Investing In Synthetic Biology." *Forbes*. Last modified September 14, 2019. https://www.forbes.com/sites/johncumbers/2019/09/14/meet-the-8-tech-titans-investing-in-synthetic-biology/

[20] ETC Group. "Forcing the Farm," October 2018. https://www.etcgroup.org/sites/www.etcgroup.org/files/files/etc_hbf_forcing_the_farm_web.pdf

immediately after the creation of the first functional gene drives with CRISPR Cas9 technology in late 2014.

In early 2015, the US National Academies of Science, Engineering and Medicine announced that they would have a major inquiry into gene drives—an unprecedented move for such a brand new (only months old) technology. The study did not explore just the science of gene drives, but also aimed to frame issues around policy, ethics, risk assessment, governance and public engagement around gene drives[21]. It was sponsored by the Defense Advanced Research Projects Agency (DARPA) and The Bill & Melinda Gates Foundation, through the National Institutes of Health (NIH) and the Foundation for the National Institutes of Health (FNIH). Several panel members were recipients of Gates funds.

Source: ETC Group[22]

The Foundation has also channeled money into the MIT media lab, home to Kevin Esvelt, who directs a group called Sculpting Evolution and was among the first people to identify the potential of CRISPR-based gene drive to alter wild populations[23]. Last year the MIT Media Lab was embroiled in a controversy when it was revealed that it had received donations from the convicted sex offender

[21] National Academies of Sciences, Engineering, and Medicine. (2016). Gene Drives on the Horizon: Advancing Science, Navigating Uncertainty, and Aligning Research with Public Values. The National Academies Press. https://doi.org/10.17226/23405

[22] "Over 200 Global Food Movement Leaders and Organizations Reject 'Gene Drives.'" *ETC Group*, October 16, 2018. https://www.etcgroup.org/content/over-200-global-food-movement-leaders-and-organizations-reject-gene-drives

[23] "Person Overview ‹ Kevin Esvelt." *MIT Media Lab*. https://www.media.mit.edu/people/esvelt/overview/

Jeffrey Epstein. Through Epstein, the media lab secured US$2 million from Gates although it is not clear for which project[24].

One of the most controversial findings which illustrate the extent to which the Gates Foundation is invested in influencing the uptake of gene drive technology was made in 2017 by civil society organizations following a Freedom of Information request. That process led to the release of a trove of emails revealing that a private PR firm called Emerging Ag, was paid US$1.6 million by the BMGF[25]. Part of their work involved coordinating the "fight back against gene drive moratorium proponents," as well as running a covert advocacy coalition to exert influence on the United Nations Convention on Biological Diversity (CBD), the key body for gene drive governance. After calls in 2016 for a global moratorium on the use of gene drive technology, the CBD sought input from scientists and experts in an online forum[26]. Emerging Ag recruited and coordinated over 65 experts, including a Gates Foundation senior official, a DARPA (Defense Advanced Research Project Agency) official, and government and university scientists, in an attempt to flood the official UN process with their coordinated inputs.

Emerging Ag Inc.[27]	2020	Malaria	Global Health	$2,509,762
Emerging Ag Inc.[28]	2017	Malaria	Global Health	$1,603,405

Source: Bill and Melinda Gates Foundation[29]

Emerging Ag now manages an overt advocacy network also funded by the BMGF called the Outreach Network for Gene Drive Research whose stated intention is to "raise awareness of the value of gene drive research for the public

[24] Farrow, Ronan. "How an Élite University Research Center Concealed Its Relationship with Jeffrey Epstein." *The New Yorker*. Last modified September 7, 2019. https://www.newyorker.com/news/news-desk/how-an-elite-university-research-center-concealed-its-relationship-with-jeffrey-epstein

[25] "Gates Foundation Paid PR Firm to Secretly Stack UN Expert Process on Controversial Extinction Technology." *Gene Drive Files | Synbiowatch*, December 1, 2017. http://genedrivefiles.synbiowatch.org/2017/12/01/gates_foundation_pr/

[26] "160 Global Groups Call for Moratorium on New Genetic Extinction Technology at UN Convention." *SynBioWatch*. Last modified December 5, 2016. http://www.synbiowatch.org/2016/12/160-global-groups-call-for-moratorium-on-new-genetic-extinction-technology-at-un-convention/

[27]" INV-005523 - Emerging Ag Inc." *Bill & Melinda Gates Foundation | How We Work | Grant* . https://www.gatesfoundation.org/How-We-Work/Quick-Links/Grants-Database/Grants/2020/05/INV-005523

[28] "Emerging Ag Inc. - OPP1174273." *Bill & Melinda Gates Foundation | How We Work | Grant*. https://www.gatesfoundation.org/How-We-Work/Quick-Links/Grants-Database/Grants/2017/07/OPP1174273

[29] "Search Results: 'Emerging Ag Inc Gene Drive.'" *Bill & Melinda Gates Foundation | How We Work | Grantmaking | Awarded Grants*. https://www.gatesfoundation.org/How-We-Work/Quick-Links/Grants-Database#q/k=emerging%20ag%20inc%20gene%20drive

good."[30] Its members include researchers and organizations that work on gene drive research, stakeholder engagement, outreach and even funders. Almost all of its members are separately funded by the Gates Foundation. In 2020, Emerging Ag received another grant from the Foundation for $2,509,762.

Governance and Lobbying at International Fora

During the international negotiations of the Convention on Biological Diversity (CBD) COP14 in Sharm el Sheikh in 2018, the influence of the Gates machinery was on clear display. The multiple initiatives in which the Foundation had invested beforehand ended up having important consequences. Not only had the Foundation sought to influence the expert panels that inform the Convention before the actual negotiations took place, but they had also managed to ensure that political support for gene drives in Africa, where the first gene drive mosquitoes are due to be released, was established well before the official negotiations, countering civil society concerns about and resistance to this highly risky technology.

About six months prior to COP14, the African Union's technical arm, the New Partnership for Africa's Development (NEPAD) released a report in support of gene drive mosquitoes for malaria eradication. A year prior to the report, NEPAD was awarded $2,350,000 from the Open Philanthropy Project, a major co-funder of Target Malaria alongside BMGF, to support the evaluation, preparation and possible deployment of gene drives. Open Philanthropy's funding priorities often move in lockstep with BMGF priorities and they are part of the same 'effective altruism' movement of technocratic billionaires. Additionally, a new crop of African negotiators, new to the CBD, arrived at the Sharm-el-Sheikh negotiations vocally arguing in favour of gene drives. Many of this new cohort were drawn from ABNE, the African Network on Biosafety Expertise—a Gates funded biotech policy network on the African continent that is at the heart of BGMF influence on African biotech policy. It was no surprise then when, at the CBD, the consensus position of the African group of delegates was one that was in favour of gene drives, and they blocked a moratorium on the release of gene drive organisms which was requested by African civil society groups[31].

So embedded were the individuals from institutions funded by the BMGF in the official negotiations that even certain people serving as official government delegates were found to have been paid or employed by Target Malaria. On the sidelines lobbyists from other Gates funded outfits, such as The Cornell Alliance for Science also railed against the moratorium proposal[32].

From bankrolling the technology development and creating the underlying tools, to shaping the narrative, picking the policy negotiators and even paying the

[30] "About." *Outreach Network for Gene Drive Research*. https://genedrivenetwork.org/#about
[31] "Do Not Betray Africa on SynBio and Gene Drives." *ETC Group*. Last modified November 19, 2018. https://www.etcgroup.org/content/do-not-betray-africa-synbio-and-gene-drives
[32] Gakpo, Joseph Opoku . "Africa Kicks against Proposed Gene Drive Moratorium at UN Biodiversity Conference." *Alliance for Science*, November 20, 2018. https://allianceforscience.cornell.edu/blog/2018/11/africa-kicks-proposed-gene-drive-moratorium-un-biodiversity-conference/

lobbyists, Bill Gates and his Foundation have so far been tightly interwoven into every part of the story of gene drive extinction technology. However, although the Foundation has been highly successful in influencing the technology's future deployment, they have not been able to suppress the global movements which have sprung up in resistance to gene drive technology. And just as health activists and food sovereignty activists have pushed back against the white saviour complex of philanthro-capitalists, so movements in West Africa have been quick to point out the racism and injustice of Gates-backed groups such as Target Malaria, who are using African people and ecosystems as experimental subjects for gene drive technology. In June 2018, over 1,000 farmers and activists protested against gene drive technology in the streets of Ouagadougou. Many are concerned about the eventual agricultural applications of gene drives and in the case of malaria, they believe that indigenous medicine and existing methods are better suited to fight the disease, particularly given the increasing number of countries which have completely eradicated it[33]. In the words of food sovereignty activist Ali Tapsoba, with the organization Terre à Vie, "The best way to fight against malaria remains to put in place a good sanitation policy for our habitats and our environment. It is out of the question for us to let these scientists continue to conduct dangerous experiments outside their laboratories." It is perhaps at its intended point of experimentation, in Burkina Faso, that the Gates machinery will finally be forced to grind to a halt.

Protest in Burkina Faso, June 2018. Photo: Terre à Vie

[33] Brown, Evan Nicole. "How Algeria and Argentina Became Officially Malaria-Free." *Atlas Obscura*. Last modified May 30, 2019. http://www.atlasobscura.com/articles/algeria-argentina-malaria-free

SCIENTIFIC TERRORISM IN BURKINA FASO

Tapsoba Ali de Goamma

After the failed adventure of genetically modified cotton[1], a future programmed drama is underway in Burkina Faso. Indeed, under the fallacious pretext of helping to fight malaria, Burkina has become an open-air laboratory where populations are used as guinea pigs by the hazardous experience: we are talking about the genetic manipulation of mosquitoes under the leadership of the Target Malaria Project[2].

Genetically modified mosquito eggs were imported from the Imperial College of London to Burkina Faso in November 2016. The Burkina Faso Institute for Health Science Research (IRSS) is the project leader in Burkina[3].

This s project is a concentration of lies:

1-Problem of informed population consent.

In the work with the populations of the Bana and Souroukoudingan villages, the Target Malaria project used the fight against malaria as an argument to convince these populations to accept the experimental release in their villages of GM mosquitoes resulting from classical transgenesis (GM non- gene drive organism (GDO) mosquitoes) in 2019 (phase 1 of the project). There was no real free and informed consent but rather an abuse of the ignorance and illiteracy of local communities, the term GMO was never mentioned, nor explained.

2-Absence of clear experimental conception

According to the Target Malaria Project, "The purpose of the small-scale release is to collect scientific data on the longevity and dispersal of released mosquitoes, and it will serve also to strengthen the capacities and operational experience of our teams"[4]. The first release took place in July 2019; 6400 GM mosquitoes were released into the wild[5]. Up until now, no impact study of this release, and no risk assessment has been made, creating a situation which is contrary to the elementary ethics of medical experimentation.

3- Absence of correct population information

The TM project expects three phases of the project. The first two concern the releases of classical type GMO mosquitoes resulting from transgenesis (a genetic manipulation based on the transfer of genes between the very different species that do not normally cross in nature) and the third - the releases of GDO mosquitoes or GMOs resulting from a gene drive.

This third phase is scheduled for 2024, but the local communities know nothing about the health and ecological hazards of what will happen, they know nothing about the real nature of the experimentation that will take place in their villages.

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[1] "BT Cotton Failure Case Witnesses from India and Burkina Faso." *People's Assembly*, November 2, 2016. https://peoplesassembly.net/bt-cotton-failure-case-witnesses-from-india-and-burkina-faso/

[2] "Target Malaria," https://targetmalaria.org/

[3] McKemey, Andrew. "Virtual Tours of Target Malaria's Insectaries to Celebrate World Mosquito Day." *Target Malaria*, August 20, 2020. https://targetmalaria.org/virtual-tours-of-target-malarias-insectaries-to-celebrate-world-mosquito-day/

[4] Gakpo , Joseph Opoku. "African Scientists Confident GMO Mosquitoes Will Be Game Changer in Fight to Control Malaria." *Alliance for Science*. Last modified September 13, 2018. https://allianceforscience.cornell.edu/blog/2018/09/african-scientists-confident-gmo-mosquitoes-will-game-changer-fight-control-malaria/

[5] "Civil Society Denounces the Release of GM Mosquitoes in Burkina Faso." *ETC Group*, July 2, 2019. https://www.etcgroup.org/content/civil-society-denounces-release-gm-mosquitoes-burkina-faso

Uncertain Project Impact

Gene drive is a new technology that causes the extermination of the entire species and it is this operation of extermination which is aimed at the *Anopheles gambiae* species which, according to Target Malaria, must be enabled to eliminate malaria. The populations are neither informed of the third phase of the project, nor of the technology of species extermination that will be used. Moreover, the *Anopheles gambiae* is not the only mosquito species that transmits malaria in Burkina Faso[6], there are others, such as *Anopheles arabiensis* and *Anopheles funestus*. The impact of the removal of one among several mosquito species is uncertain.

March against Target Malaria, Burkina Faso, 2019

Ethical violations

Target Malaria offers the inhabitants of the villages a small income under conditions qualified as the basic ethical violation - be paid for accepting to be bitten by mosquitoes is an absence of respect for indigenous people, which is contrary to the Declaration of Helsinki of the World Medical Association which governs medical research.

Since the announcement of the Target Malaria project, the civil society has mobilized to say NO to this dangerous project and is determined to remove it from Burkina Faso, as they had already done with Monsanto[7].

[6] Afrane, Y. A., Bonizzoni, M., & Yan, G. (2016). Secondary malaria vectors of sub-saharan africa: Threat to malaria elimination on the continent? *Current Topics in Malaria*. https://doi.org/10.5772/65359

[7] "The Retreat from Monsanto Bt Cotton in Burkina Faso." *Environmental Justice Atlas*. Last modified August 17, 2017. https://ejatlas.org/conflict/the-retreat-from-monsanto-bt-cotton-burkina-faso.

GLOBAL RESISTANCE TO GENETIC EXTINCTION TECHNOLOGY

Besides constantly exposing the dangers of releasing the untested technology of Gene Editing and Gene Drives in the environment, as well as the lack of transparency in the decision process[1], independent scientists, indigenous peoples, and civil society movements across the world have constantly been carrying out actions of resistance.

In December 2016, over 160 civil society organisations from six continents called for a "Moratorium on New Genetic Extinction Technology" at the 2016 UN Convention on Biological Diversity (CBD) in Cancun, Mexico[2]. This moratorium call included both lab research and field trials, because of the potentially devastating effects that synthetic biology can have on entire ecosystems[3].

Even though the moratorium found support among some countries, the final agreement merely urged caution in field-testing the products of synthetic biology, including gene drives, while supporting better risk-assessment of the products' potential effects[4].

There has been no lack of attempts by the industry, through a Gates-funded lobby firm, to manipulate the UN decision-making process over gene drives, as emerged from a set of documents, released in December 2017, revealing how external actors with interest in the development of gene drives coordinated among themselves to influence the work of the relevant UN expert group[5].

In July 2018, The European Court of Justice ruled that organisms obtained by mutagenesis plant breeding techniques are GMOs and should fall under the GMO Directive[6].

The court ruling was seen as a victory for environmentalists while the agrifood industry and farmers organisations started a lobbying campaign to roll-back the ECJ ruling in favor of a new EU legislation[7].

Independent scientists publicly demanded precaution[8], stating that gene-edited products must be strictly regulated with full recognition of the uncertainties of the gene-

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[1] "Gene Drive Extinction Technology Is a War against the Planet and Biodiversity." *Navdanya International*, December 7, 2017. https://navdanyainternational.org/gene-drive-extinction-technology/

[2] "160 Global Groups Call for Moratorium on New Genetic Extinction Technology at UN Convention." *SynBioWatch*, December 5, 2016. http://www.synbiowatch.org/2016/12/160-global-groups-call-for-moratorium-on-new-genetic-extinction-technology-at-un-convention/

[3] "Call for a Global Moratorium on Gene Drives." *SynBioWatch*. http://www.synbiowatch.org/gene-drives/gene-drives-moratorium/

[4] "ENB Report | CBD COP 13 | 2-18 December 2016 | Cancún, MX | IISD Reporting Services." http://enb.iisd.org/vol09/enb09678e.html

[5] "Gene Drive Files Reveal Covert Lobbying Tactics to Influence UN Expert Group ." *Corporate Europe Observatory*, December 3, 2017. https://corporateeurope.org/en/food-and-agriculture/2017/12/gene-drive-files-reveal-covert-lobbying-tactics-influence-un-expert

[6] Court of Justice of the European Union, PRESS RELEASE No111/18, Luxembourg, 25 July 2018, Judgment in Case C-528/16, https://curia.europa.eu/jcms/upload/docs/application/pdf/2018-07/cp180111en.pdf

[7] Antoniou, Michael. "The EU Must Not De-Regulate Gene-Edited Crops and Foods." *Www.Euractiv.Com*, July 9, 2019. https://www.euractiv.com/section/agriculture-food/opinion/the-eu-must-not-de-regulate-gene-edited-crops-and-foods/

[8] ENSSER Statement on New Genetic Modification Techniques: Products of new genetic modification techniques should be strictly regulated as GMOs, European Network of Scientists for Social and Environmental Responsibility, 27 September 2017, https://ensser.org/publications/ngmt-statement/

editing process – and that they must be labelled to enable farmer and consumer choice[9].

In October 2018, in view of the 2018 CBD Conference of the Parties (COP), a broad alliance of indigenous peoples and civil society organizations published a "Call to Protect Food Systems from Genetic Extinction Technology"[10]. All the while, a coalition of European movements called upon the European Commission to support an international moratorium on the release of organisms modified by gene drive technology into the environment [11].

The global decision passed at the 2018 CBD COP, did not issue any moratorium, but set further barriers to the release of gene drives, by reinforcing as a priority the need to seek free, prior and informed consent or approval from all potentially impacted communities and Indigenous Peoples before even considering environmental release of gene drive organisms[12].

Along the same lines, in 2020, a similar coalition of European movements has requested that the EU Commission fully supports the EU Parliament's call for a global moratorium on the release of Gene Drive Organisms, in view of the EU preparation for the upcoming Conference of the Parties (COP15) to the Convention on Biological Diversity (CBD) and the Cartagena Protocol on Biosafety (COP-MOP10)[13].

In the UK, Beyond GM, GM Freeze and GM Watch started a mobilization campaign[14] in July 2020, in response to a proposed amendment[15] to the Agriculture Bill, that would give the Secretary of State for the Environment, Food and Rural Affairs (currently George Eustice) the power to change the definition of a genetically modified organism (GMO) and re-classify many forms of genome editing as non-GM. Meaning that gene-editing / genetic modification techniques would no longer be regulated and could be used on farms and in food without public knowledge or consent.

In its last meeting before the summer recess, the House of Lords finally withdrew the amendment but only after the government renewed its commitment to push, promote and facilitate the wide use of genome editing in the future of UK farming and food[16].

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[9] Eckerstorfer, M. F., Dolezel, M., Heissenberger, A., Miklau, M., Reichenbecher, W., Steinbrecher, R. A., & Waßmann, F. (2019). An EU Perspective on Biosafety Considerations For Plants Developed by Genome Editing and Other New Genetic Modification Techniques (nGMs). *Frontiers in Bioengineering and Biotechnology*, *7*. https://doi.org/10.3389/fbioe.2019.00031

[10] A Call to Protect Food Systems from Genetic Extinction Technology: The Global Food and Agriculture Movement Says NO to Release of Gene Drives, ETC Group, https://www.etcgroup.org/sites/www.etcgroup.org/files/files/call_to_protect_food_systems_oct_17th.pdf

[11] "Open Letter to EU Commission to Support International Moratorium on Gene Drives." *Navdanya International*, October 26, 2018. https://navdanyainternational.org/gene-drives-morat-eu/

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GATES FOUNDATION HIRED PR FIRM TO MANIPULATE UN OVER GENE DRIVES

Jonathan Latham

Originally Published December 4, 2017 at Independent Science News[1]

The Bill and Melinda Gates Foundation this year paid a PR firm called Emerging Ag[2] $1.6 million to recruit a covert coalition of academics to manipulate a UN decision-making process over gene drives, according to emails obtained through Freedom of Information requests.

Gene drives are a highly controversial new genetic extinction technology. They have been proposed as potentially able to eradicate malarial mosquitoes, agricultural pests, invasive species, as well as having potential military uses[3].

Emerging Ag calls itself "a boutique international consulting firm providing communications and public affairs services." Its president and founder is Robynne Anderson, a former international communications director of CropLife, the global lobby group for the biotechnology, seed, and pesticide industries[4].

The FOIA emails reveal that the project coordinated by Emerging Ag was dubbed the "Gene Drive Research Sponsors and Supporters coalition"[5]. It consisted of three members of a UN committee called the Ad Hoc Technical Expert Group on Synthetic Biology (AHTEG) plus a larger group of 65 covertly recruited, but seemingly independent, scientists and officials, all coordinated by a still larger number of government officials (mainly from English-speaking countries), PR advisors, academics, and members of various Gates-funded projects.

The AHTEG on Synthetic Biology is part of the UN Convention on Biological Diversity (CBD). This AHTEG is tasked with creating a formal set of regulatory recommendations to help governments avoid negative impacts on biodiversity. Its recommendations are supposed to draw from the discussions of an online forum of experts called The UN CBD Online Forum on Synthetic Biology.

The three AHTEG members who coordinated with Emerging Ag are Dr. Todd Kuiken of North Carolina State University, Robert Friedman of the J Craig Venter Institute[6], and Professor Paul Freemont of Imperial College, London. The first and last represent teams and institutions that have received at least $99 million dollars between them from the U.S. military and U.S. foundations, including Gates, to develop and test gene drive systems.

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The CBD online forum on synthetic biology

According to the emails[7], which were obtained from the University of North Carolina by Edward Hammond of Prickly Research[8], the Gates funding for Emerging Ag was obtained to co-ordinate a "fight back against gene drive moratorium proponents."

Funding for Emerging Ag first began after the last full meeting of the UN Convention on Biological Diversity, held in Cancún, Mexico in December 2016 which witnessed calls from Southern countries and over 170 international organizations for a UN moratorium on gene drives[9]. Adding to the pressure was a letter titled, "A Call for Conservation with a Conscience: No Place for Gene Drives in Conservation," signed by 30 environmental leaders, including Jane Goodall. The letter asked for a "halt to all proposals for the use of gene drive technologies, but especially in conservation."[10]

A primary function of Emerging Ag was to recruit academics. The primary task of the covertly recruited academics (those who were not on the inner circle of the AHTEG itself) was thus to stack the UN's CBD Online Forum on Synthetic Biology. This forum was expected to discuss the wide scientific concerns about gene drives[11]. The UN CBD process is the only multilateral process currently addressing gene drives.

Recruited academics received daily briefings and instructions from Emerging Ag on how to influence the discussion:

"My name is Ben Robinson, I work with Isabelle Coche & Delphine Thizy, and I will be sending you regular updates on the discussions taking place in the context of the CBD's Open-Ended Online Forum on synthetic biology. I will monitor contributions and provide you with brief summaries of the content and tenor of conversations, while highlighting topics and posts you may wish to address. Should you feel that a topic needs to be addressed but you do not have the relevant resources or expertise, I can also help identify and coordinate those best suited among the group to respond to particular issues."

The key role of the Gates Foundation

Delphine Thizy[12], cited in the email above, works at Target Malaria in London, England. Target Malaria is a Gates-funded project to use gene drives against mosquitoes[13].

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Emerging Ag's activities were overseen by Jeff Chertack who is Senior Program Officer of Global Policy and Advocacy at the Bill and Melinda Gates Foundation. He is a former public affairs executive from Ogilvy PR who previously represented biotech and pharma giants in Brussels. Chertack sat on the co-ordination team of Emerging Ag's "Gene Drive Research Sponsors and Supporters coalition"[14] and is copied on several strategy calls and co-ordination phone calls[15].

This is also not the first time that the Gates Foundation has used academics to influence public and private opinion on genetic engineering technologies, as witnessed by its funding of the Cornell Alliance for Science[16].

Public Research and Regulation Initiative

The FOIA emails reveal that Emerging Ag also collaborated with a lobby group called the Public Research and Regulation Initiative (PRRI)[17] that is little known outside the Convention on Biological Diversity.

PRRI has a related influence operation which predates the efforts of Emerging Ag. Its history of lobbying the UN Convention on Biological Diversity over GMOs is mentioned in emails sent to a Canadian official on the UN AHTEG[18]. In them, a PRRI member, Piet Vander Meer[19], boasts about its 24/7 "backup operation" for "like-minded" government and industry experts who sit on the AHTEG.

The emails suggest that national government representatives of Canada, U.S., UK, Brazil and the Netherlands were being remotely assisted by PRRI during closed door discussions. To help PRRI the 'Gene Drive Research Sponsors and Supporters coalition' offered to approach US Department of Agriculture (USDA) contacts to find additional funding for PRRI's activities. The current funding sources of PRRI are not known but former funders include CropLife International, Monsanto and the US Grains Council[20].

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BIODIVERSITY, GMOS, & GENE DRIVES OF THE MILITARISED MIND

Vandana Shiva

Originally published in Seed Freedom[1]*, July 7, 2016*

A 2016 report from the National Academy of Science of The United States, titled "Gene Drives on the Horizon : Advancing Science, Navigating Uncertainty, and Aligning Research with Public Values"[2] warns: "One possible goal of release of a gene-drive modified organism is to cause the extinction of the target species or a drastic reduction in its abundance."

Gene Drives have been called "mutagenic chain reactions" and are to the biological world what chain reactions are to the nuclear world. The Guardian describes Gene Drives as the "gene bomb"[3].

Kevin Esvelt of MIT exclaims "a release anywhere is likely to be a release everywhere", and asks "Do you really have the right to run an experiment where if you screw up, it affects the whole world?"[4]
The NAS report cites the case of wiping out amaranth as an example of "potential benefit".

The Problem

"Palmer amaranth infests agricultural fields throughout the American South. It has evolved resistance to the herbicide glyphosate, the world's most-used herbicide (Powles, 2008), and this resistance has become geographically widespread."[5]

Industrial agriculture – promoted by the United States Foreign Policy – treats amaranth greens as "weeds", and first tried to exterminate them with herbicides. Then came Monsanto, with Roundup Ready crops, genetically engineered to resist the spraying of Roundup so that the GMO crop would survive the otherwise lethal chemical, while everything else that was green perished. But not Palmer Amaranth, the superweed.

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A quick fix involving potential irreparable damage

Instead of seeing the emergence of Palmer Amaranth as a superweed, as a result of the failure of the misguided approach of herbicide resistant GMOs, Monsanto & Co – which includes investors, scientists, corporations, DARPA, and Gates – are now rushing to drive the Amaranth species to extinction through the deployment of an untested tool. The tool of gene editing and gene drives.

A "DARPA-Mind" report casually states potential harm:
"*Gene drives developed for agricultural purposes could also have adverse effects on human well-being. Transfer of a suppression drive to a non-target wild species could have both adverse environmental outcomes and harmful effects on vegetable crops, for example. Palmer amaranth in Case Study 6 is a damaging weed in the United States, but related Amaranthus species are cultivated for food in Mexico, South America, India, and China.*" [6]

A scientific assessment would tell us that plants evolve resistance to herbicides which are supposed to kill them because they have intelligence, they evolve, and simply by the law of natural selection, they develop resistance. Denial of the intelligence in life, and denial of evolution is unscientific.

Amaranth is a web of life in itself

Amaranth's root, the word amara – meaning 'eternal' and 'deathless' in both Greek and Sanskrit – connects two formidable Houses of the ancient world. From the high slopes of the Himalayas, through the plains of north, central and south India, to the coastlines of the east, west and the south, Amaranth is a web of life in itself. Numerous varieties are found throughout the country. In fact, the Himalayan region is one of the 'centres of diversity' for the Amaranth.

Amaranth, amaranto, love-lies-bleeding, tassel flower, Joseph's coat, or ramdana (gods own grain) is the grain of well-being. It is rich in names, nutrition, history and meaning. There are records of Amaranth cultivation in South and Meso America as far back as 5,000 B.C. The sacred Amaranth criss-crosses the Ancient World, nourishing cultures from the Andes to the Himalayas. Amaranth is a sacred grain for the Indian Civilisation as much as it is for the Aztec Civilisation, civilisations in the shadow of time, yet very much alive.

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The leaves of the amaranth contain more iron than spinach, and have a much more delicate taste. Besides rice bran, the grain of the amaranth has the highest content of iron amongst cereals. 1 kilogram of Amaranth flour, added to 1 kilogram of refined wheat flour, increases its iron content from 25 milligrams to 245 milligrams. Adding amaranth flour to wheat/rice flour is a cheaper and healthier way to prevent nutritional anaemia; rather than buying expensive tablets, tonics, health drinks, branded or bio fortified flour.

The Amaranth is extremely rich in complex carbohydrates and in proteins.[7] It has 12–18% more protein than other cereals, particularly lysine – a critical amino acid.[8] It also differs from other cereals in that 65% is found in the germ and 35% in the endosperm, as compared to an average of 15% in the germ and 85% in the endosperm for other cereals. When Amaranth flour is mixed 30:70 with either rice flour or wheat flour, protein quality rises, from 72 to 90, and 32 to 52, respectively. The Amaranth grain is about the richest source of calcium, other than milk. It has 390 grams of calcium compared to 10 grams in rice, and 23 grams in refined flour.[9]

The diversity of Amaranth greens is incredible, edibles that grow uncultivated in our fields. They are a major source of nutrition. Per 100 grams, Amaranth greens can give us 5.9 grams of protein, 530 milligrams of calcium, 83 milligrams of phosphorus, 38.5 milligrams of iron,14,190 micrograms of carotene, 68 micrograms of Vitamin-C,122 milligrams of magnesium. [10, 11, 12, 13]

Amaranth is a superior alternative as a carotene source to GMO Golden Rice – which is being promoted as a future miracle for addressing Vitamin A deficiency. The poorest, landless woman and her children have access to nutrition through the generous gift of the Amaranth plant.

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Conclusions

The paradigm of genetic engineering is based on genetic determinism and genetic reductionism. It is based on a denial of the self-organised, evolutionary potential of living organisms. It treats living organisms as a play lego set. But it is not, life is complex, self-organised, dynamic evolution – autopoietic.

The right to food and nutrition of the people outside the US, and the right of amaranth to continue to grow and evolve and nourish people, can be extinguished by powerful men in the US because they messed up their agriculture with Roundup Ready crops. And now want to mess up the planet, its biodiversity, and food and agriculture systems of the world with the tool of gene drives to push species to extinction.

As in the case of GMOs, the rush for Gene Drives, and CRISPR-based gene editing are linked to patents. And Bill Gates is financing the research that is leading to these patents. He with other billionaires has invested $120 million in a company EDITAS to promote these technologies[14]. Bayer, the new face of Monsanto & Co, has invested $35 million in the new GMO technologies, and committed over $300 million over the next 5 years[15].

"Biofortification" has been given the world food prize of 2016, yet biofortification is inferior to the nutrition provided by biodiversity and indigenous knowledge. The same forces promoting biofortification are also promoting the extermination of nutritious crops like amaranth, as well as rich indigenous cultures of food.

The project of deliberately exterminating species is a crime against nature and humanity. We are members of an Earth Family. Every species, every race is a member of one Earth Community. We cannot allow some members of our Earth Family to allocate to themselves the power and hubris to decide who will live, and who will be exterminated. The DARPA-Mind is obsolete.

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Gates to a Global Empire

…over Seed, Food, Health, Knowledge and The Earth

A Global Citizens' Report

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