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Pro- Proactionary Principle- Explained

The proactionary principle entails: the freedom to innovate, objectivity, comprehensiveness, transparency, simplicity, triage, symmetrical treatment, proportionality, prioritization, and renewing and refreshing.

Dr. Moore; 2005 (Max; "proactionary principle"; version 1.2; july 29; http://www.maxmore.com/proactionary.html)

We can call this "the" Proactionary Principle so long as we realize that the underlying Principle is less like a sound bite than a set of nested Chinese boxes or Russian matroshka (babushka) dolls. If we pry open the lid of this introductory-level version of the Principle, we will discover nine component principles lying within:

1. **Freedom to innovate:** Our freedom to innovate technologically is valuable to humanity. The **burden of proof** therefore belongs to those who **propose restrictive measures**. All proposed measures should be closely scrutinized.
2. **Objectivity:** Use a decision process that is objective, structured, and explicit. Evaluate risks and generate forecasts according to available science, not emotionally shaped perceptions; use explicit forecasting processes; fully disclose the forecasting procedure; ensure that the information and decision procedures are objective; rigorously structure the inputs to the forecasting procedure; reduce biases by selecting disinterested experts, by using the devil's advocate procedure with judgmental methods, and by using auditing procedures such as review panels.
3. **Comprehensiveness:** Consider all reasonable alternative actions, including no action. Estimate the opportunities lost by abandoning a technology, and take into account the costs and risks of substituting other credible options. When making these estimates, carefully consider not only concentrated and immediate effects, but also widely distributed and follow-on effects.
4. **Openness/Transparency:** Take into account the interests of all potentially affected parties, and keep the process open to input from those parties.
5. **Simplicity:** Use methods that are no more complex than necessary
6. **Triage:** Give precedence to ameliorating known and proven threats to human health and environmental quality over acting against hypothetical risks.
7. **Symmetrical treatment:** Treat technological risks on the same basis as natural risks; avoid underweighting natural risks and overweighting human-technological risks. Fully account for the benefits of technological advances.
8. **Proportionality:** Consider restrictive measures only if the potential impact of an activity has both significant probability and severity. In such cases, if the activity also generates benefits, discount the impacts according to the feasibility of adapting to the adverse effects. If measures to limit technological advance do appear justified, ensure that the extent of those measures is proportionate to the extent of the probable effects.
9. **Prioritize (Prioritization):** When choosing among measures to ameliorate unwanted side effects, prioritize decision criteria as follows: (a) Give priority to risks to human and other intelligent life over risks to other species; (b) give non-lethal threats to human health priority over threats limited to the environment (within reasonable limits); (c) give priority to immediate threats over distant threats; (d) prefer the measure with the highest expectation value by giving priority to more certain over less certain threats, and to irreversible or persistent impacts over transient impacts.
10. **Renew and Refresh:** Create a trigger to prompt decision makers to revisit the decision, far enough in the future that conditions may have changed significantly.

Pro- Proactionary Principle- Democratic Transhumanism

Precautionary principle is a Luddite Trojan Horse for technology- it privileges status quo bias at the expense of control over our body and individual self determination.
Hughes, Bioethicist and sociologist @ Trinity College & Dir IEET; 2004 (James; "a conversation with dr. james Hughes"; http://ieet.org/index.php/IEET/more/cascio20041201)

Hughes: The precautionary principle is a Luddite Trojan Horse. It starts with the uncontroversial principle that technologies should be assessed for their risks before they are deployed. That's no problem, and we can argue about what kinds of approval processes and regulatory agencies are adequate, and when we have sufficient information of the risk/benefit ratios. But when the principle is applied by the technophobic, to things like human genetic engineering, the precautionary principle becomes a rationale for permanent bans. The first thing the technophobic do is systematically rubbish the potential benefits, and take seriously every hypothetical harm from now until the end of time. Their second argument appeals to the virtue of the known and the supposed inevitability that human efforts to engineer the delicate, evolved mechanisms of nature are doomed to disaster. On those grounds, no clinical trial or EPA assessment could ever capture the real long-term risks of genetic engineering.
Nick Bostrom has just written a brilliant paper about the "status quo bias" in everyday heuristics, and how it is expressed in bioethics. Once we take account of real, proximate risks and benefits of human enhancement technologies in a balanced way there certainly will be a case for banning some until they are safer. For instance, the World Transhumanist Association has taken the position that experiments with human reproductive cloning are currently unethical since the animal research suggests a very high risk of birth defects. Once the animal research has got the success rate up and birth defects low, then there the risk-benefit would pass the threshold for permitting the technique for parents who have genetic or infertility problems and want a child related to one of the parents. Then, when the risk of birth defects in these first clones has been assessed, and the technique demonstrated to be safe, we should permit all would be parents to use it.
This process suggests the other huge problem with applying the precautionary principle to human enhancement. Banning a new industrial chemical on precautionary principle grounds doesn't step on an individual's self-determination, but stopping them from exercising control over their own body, brain and reproduction does. For instance, Western feminists are delighted to encourage India and China to restrict women's access to ultrasound and abortion, restrictions most American women would never accept, all to prevent largely hypothetical future social consequences of imbalanced gender ratios from sex selection. As a consequence these laws not only harm the women who lose some of their reproductive choices, but also the girls born into families that don't want them, and who at best are given up for adoption. The way people use the precautionary principle is to argue that the difficulties that boys in the class of 2020 will have in getting a date to the prom trump all other concerns. I don't think so.

Prevents speciesism, racism, sexism- all being of sentience, including ai and et, human and non-human animals, deserve out moral sentiments and concern.
Bostrom, Prof Philosophy @ Oxford; 5 (Nick; "transhumanist values"; http://www.nickbostrom.com/ethics/values.html

Transhumanism advocates the well-being of all sentience, whether in artificial intellects, humans, and non-human animals (including extraterrestrial species, if there are any). Racism, sexism, speciesism, belligerent nationalism and religious intolerance are unacceptable. In addition to the usual grounds for deeming such practices objectionable, there is also a specifically transhumanist motivation for this. In order to prepare for a time when the human species may start branching out in various directions, we need to start now to strongly encourage the development of moral sentiments that are broad enough encompass within the sphere of moral concern sentiences that are constituted differently from ourselves.

Pro- Proactionary Principle- Democratic Transhumanism

Bioethics like the aff are the new form of biopolitics.
Hughes, Bioethicist and sociologist @ Trinity College & Dir IEET; 2002 (John; "Democratic transhumanism 2.0"; http://www.changesurfer.com/Acad/DemocraticTranshumanism.htm)

Bioethics is proto-biopolitics. As public debate and biopolitical ideologies crystallize and polarize, bioethicists will increasingly be revealed as partisan activists rather than experts applying universally accepted ethical principles. In fact, the mask has already seriously slipped. While President Clinton's Presidential Bioethics Commissison was broadly representative of academic bioethics, the political design of President Bush's Bioethics Commission is quite naked. Bush chose Leon Kass as Grand Vizier of his committee, a man who is opposed to every intervention into human reproduction from in vitro fertilization to reproductive cloning, capping the ascendance of Luddism in bioethics. Kass in turn stacked the committee with both conservative bioethicists, such as Mary Ann Glendon and Gilbert Meilander, and conservatives with little or no connection to academic bioethics, such as Francis Fukuyama and Charles Krauthammer. The current campaign of the Bush administration and Kass' committee is to criminalize the use of embryos and embryo cloning in research.

Proactionary Principle is a pivotal tenet of transhumanism.
Vita-More, PHD candidate @ Univ Plymouth Planetary Collegium Centre for Advanced Inquiry in the Interactive Arts, and President of Extropy Instit; 2000 (Natasha; "the transhumanist culture"; http://www.natasha.cc/transhumanistculture.htm)

One pivotal tenet of transhumanism is the newly developed *Proactionary Principle*, a principle developed to counter social resistance to social change and technology. In order to design a future that is both safe and functional for society, that has a sense of sustainability and progress, that provides an environment for innovation, and that is both comfortable and nurturing, it is understood as essential that we do so with a fair amount of intelligence, creativity and rational.

When journalists write about the transhumanism, they often become bogged down in the science and technology of the future rather than including the cultural movement itself and the "design" of the future. As an artist, it is the design of the future that is most alluring about transhumanism—the architecture of its culture, the aesthetics of its future, the smells, sounds, visuals, and feelings that heighten the senses. It is the sense of design of the future that inspired my design "Primo Posthuman" as a future body prototype.

Pro- Proactionary Principle- Democratic Transhumanism

Democratic techno-optimism is anti-trust and intellectual property, and supports regulation to protect competition and scientific innovation. The biopunks promote access to scientific information to speed the development of innovations against medical and pharmaceutical efforts to be the sole exploiters of the data.

Hughes, Bioethicist and sociologist @ Trinity College & Dir IEET; 2002 (John; "Democratic transhumanism 2.0"; http://www.changesurfer.com/Acad/DemocraticTranshumanism.htm)

BioPunks

While libertarians celebrate high tech entrepreneurs and innovators, they occasionally have qualms about the effects that monopolists like Microsoft and overly aggressive interpretations of intellectual property law have on innovation. In reaction to monopolists libertarians have supported voluntary efforts, such as the open source movement. If we all used Linux, a free open-source operating system, we could force Microsoft to improve Windows, or at least that's how the argument goes. The goal of the open source movement is challenge the monopolists from below, by building a community around the constant refining of hopefully more robust and cheaper information technologies. Most libertarians are far more skittish of government "trust-busting," or any "defense of the commons" that declares the genome and industrial innovation to be public property. Democratic techno-optimists, on the other hand, are already distinguishing themselves by their willingness to use anti-trust law, restrictions on intellectual property, and regulatory standards to protect competition, scientific innovation and the public good.

For instance science writer Annalee Newitz has pointed to an emerging "biopunk" ethos in the work of artists and anti-corporate genetics researchers. Biopunks are committed both to the benefits that can can emerge from genetic technology, and to opposing the madness of patents on discovered genomes that allow corporate control of genetic data which should be in the public domain. Biopunks protest both "bioLuddites and apologists for the biotech industry." Newitz finds biopunk sensibilities expressed in groups like the Coalition of Artists and Life Forms (CALF), a loose network of artists who celebrate biotechnology while remaining critical of its capitalist exploitation and limitations. Biopunk sensibilities among scientists, Newitz argues, can be seen in the growing call for the "open sourcing" of scientific information, from the human genome databases to scientific journals. Gene sequencers working within the Human Genome Initative, for instance, deposited their data in the publicly accessible GenBank, and now researchers outside of corporate labs deposit gene expression data in the public Gene Expression Omnibus database.

One biopunk effort is the National Functional Magnetic Resonance Imaging Data Center (fMRIDC) established by brain scientist Michael Gazzaniga and others at Dartmouth College. The fMRIDC aggregates enormous files of brain scans into a supercomputer to create an atlas of normal and dysfunctional brains, at work and at play. When cognitive science journals began to require that the data used in studies they published be submitted for public use in the fMRIDC scientists balked. Some researchers were involved in proprietary medical and pharmaceutical research and others simply wanted to be the sole exploiters of their data. But as Gazzaniga and collaborator Daniel Rockmore argued in the Chronicle of Higher Education "shared databases speed the development of the disciplines that use them. Recent advances in informatics-or data mining-make it possible to use databases as primary research material. The resulting meta-analyses give researchers ideas for new experiments, cut down on duplication of effort, and allow researchers from other disciplines to work in the field." Most brain research had received public financing in any case, which obliged researchers to share their data. In a related effort the International Cosortium on Brain Mapping has compiled data from the brains of 7000 subjects.

Pro- Proactionary Principle- Innovation

Precautionary principle stifles technological innovation that is necessary to the survival and well being of humanity. New technologies will feed billions of people, counter natural threats from pathogens to environmental changes, and alleviate suffering from disease, damage, and old age. Precautionary principle's inherent bias towards status quo decision making is reactive and pessimistic of technological progress. The proactionary principle takes into account all consequences of activity while evolving and adapting to remedy side effects.

Dr. Moore; 2005 (Max; "proactionary principle"; version 1.2; july 29; http://www.maxmore.com/proactionary.html)

A Proactionary Alternative to the Precautionary Principle

The Proactionary Principle emerged out of a critical discussion of the widely used "precautionary principle" during Extropy Institute's Vital Progress Summit I in 2004. The precautionary principle has been used as a means of deciding whether to allow an activity (typically involving corporate activity and technological innovation) that *might* have undesirable side-effects on human health or the environment. In practice, that principle is strongly biased against the technological progress so vital to the continued survival and well-being of humanity.

Understanding that we need to develop and deploy new technologies to feed billions more people over the coming decades, to counter natural threats from pathogens to environmental changes, and to alleviate human suffering from disease, damage, and the ravages of aging, those involved in the VP Summit recognized two things: The importance of critically analyzing the precautionary principle, and the formation of an alternative, more sophisticated principle that incorporates more extensive and accurate assessment of options while protecting our fundamental responsibility and liberty to experiment and innovate.

The precautionary principle, while well-intended by many of its proponents, inherently biases decision making institutions toward the status quo, and reflects a reactive, excessively pessimistic view of technological progress. By contrast, the Proactionary Principle urges all parties to actively take into account *all* the consequences of an activity—good as well as bad—while apportioning precautionary measures to the real threats we face, in the context of an appreciation of the crucial role played by technological innovation and humanity's evolving ability to adapt to and remedy any undesirable side-effects.

Pro- Proactionary Principle- Integrated Circuit

Integrated circuits and computers will drive us to extinction in less than 80 years unless we accelerate human evolution with genetic engineering.
Blonder, scientist in communications industry; 1995 (Greg; Wired; Issue 3.03; March; "faded genes"; http://archive.wired.com/wired/archive/3.03/blonder.if.html)

In 2088, our branch on the tree of life will come crashing down, ending a very modest (if critically acclaimed) run on planet earth. The culprit? Not global warming. Not atomic war. Not flesh-eating bacteria.
Not even too much television. The culprit is the integrated circuit - aided by the surprising power of exponential growth. We will be driven to extinction by a smarter and more adaptable species - the computer. And our only hope is to try and accelerate human evolution with the aid of genetic engineering.

Computers advancing at an exponential rate- by 2088 enough code will exist to fill the silicon brain. By 2090 computers will be twice as smart as any humans.
Blonder, scientist in communications industry; 1995 (Greg; Wired; Issue 3.03; March; "faded genes"; http://archive.wired.com/wired/archive/3.03/blonder.if.html)

The cost and intelligence of computers follows an exponential curve, having improved by a factor of two every 30 months over the last century. That's a factor of 1 trillion every 100 years, and there is no sign the pace will slow appreciably for another century. Processors that once filled entire floors - directing the manufacture of automobile engines - now sit inside V-8s, adjusting valve timing. And by 2088, that box of silicon, wires, and plastic will place humans on the endangered species list.
Why 2088? Well, by 2088, the next factor of a trillion enables computers to match human beings in skills and intelligence. In some respects, they already have. The "operating system" for a person is his or her genetic code. DNA instructs each cell in a body how to grow, how to deal with infection, and how to wire neurons in the brain to think. The program is about 3 billion bits long. Sure, 3 billion bits sounds impressive, but the genetic code is small enough to fit comfortably on a CD-ROM. Like DOS, each new version consists of modules incorporating the baggage of previous generations - the history of evolution is written in our genes. But unlike DOS, even some minor code rewrites are worth the price of an upgrade. For example, out of the 3,000,000,000 odd bits of DNA, human beings and chimpanzees have 2,999,400,000 in common. It may be hard to believe, but you and Rush Limbaugh are just a few snips of the genetic shears apart.
Still, DNA without a brain is useless. No one is exactly sure how many neurons fill each cranium, but they're thought to number around 10 billion. And each neuron turns on and off about 1,000 times a second. If the brain were a computer, it would be rated at 10 trillion operations per second.
By 2088, enough code will exist to fill the silicon brain. Some of the code may start out as modules intended to help cameras in factories track parts along assembly lines. These modules will be recycled for the computer's eyes. Weather forecasting models will join with genetic programs, helping the computer to anticipate changes in its environment. Trading software from Wall Street will sharpen its negotiation skills. Some parts will write themselves, as the computer varies its genetic code and keeps only those changes it judges beneficial. Like our own DNA, the computer's genetic code will betray its heritage after millions of experiments.

The scary thing isn't that computers will match our intelligence by 2088; the scary thing is that this exponential curve keeps on going, and going, and going. By 2090, the computer will be twice as smart and twice as insightful as any human being. It will never lose a game of chess, never forget a face, never forget the lessons of history. By 2100, the gap will grow to the point at which homo sapiens, relatively speaking, might make a good pet. Then again, the computers of 2088 might not give us a second thought.

Pro- Proactionary Principle- Integrated Circuit

Fight back against the integrated circuit- accelerate evolution and genetic programming of humans. Blonder, scientist in communications industry; 1995 (Greg; Wired; Issue 3.03; March; "faded genes"; http://archive.wired.com/wired/archive/3.03/blonder.if.html)

What's a poor human to do? We might fight back, smashing integrated-circuit fab lines, but society couldn't function without its silicon codependents.
No integrated circuits? Then no Swatch watches, no low-polluting cars, no credit cards. We need integrated circuits as much as they need us. If we had a little time, say another couple hundred million years, evolution might have time to kick in. After all, evolution propelled mammals out from under the feet of dinosaurs and into the canyons of Manhattan; perhaps Darwin's great insight could get us out of this mess as well.
Unfortunately, the benign pruning of human genes by evolution's hand is a bit too slow and undirected to play guardian angel. A hundred years isn't much time for evolution to work its magic. So mankind is fortunate that gene splicing arose at the same moment in history as the computer.
Today, gene splicing coaxes vats of bacteria into producing human insulin by the gallon. The first tentative steps in repairing human genetic disease have succeeded, "upgrading" a child's genetic code beyond the parents initial, but flawed, design. Eventually, DNA engineering will be commonplace. People will snip out genes to regrow nerves damaged in a car accident or modify others to control cholesterol.
Tampering with nature seems foolhardy, but there really isn't any choice. Humans are programming computers today that will someday take our place in nature - it would be foolhardy not to program our own genetic code in response.

Pro- Proactionary Principle- Limitations

Technological gene replacement eliminates the two largest causes of death, heart disease and cancer, as well as other disorders like cystic fibrosis and sickle cell.

Minsky, MIT Media and AI lab; 1994 (Marvin; Scientific American; October; "will robots inherit the earth"; https://web.media.mit.edu/~minsky/papers/sciam.inherit.html)

The major causes of death result from the effects of inherited genes. These genes include those that seem to be largely responsible for heart disease and cancer, the two largest causes of mortality, as well as countless other disorders such as cystic fibrosis and sickle cell anemia. New technologies should be able to prevent some of these disorders by finding ways to replace those genes.
Perhaps worst of all, we suffer from defects inherent in how our genetic system works. The relationship between genes and cells is exceedingly indirect; there are no blueprints or maps to guide our genes as they build or rebuild the body. As we learn more about our genes, we will hopefully be able to correct, or at least postpone many conditions that still plague our later years.

Pro- Proactionary Principle- Precautionary Bad

Precautionary principle fails- 6 reasons.
Dr. Moore; 2005 (Max; "proactionary principle"; version 1.2; july 29; http://www.maxmore.com/proactionary.html)

First, the precautionary principle always assumes worst-case scenarios. Any release of chemicals into the environment *might* initiate a chain of events leading to a disaster. Genetically modified organisms *might* cause unanticipated, serious, and irreversible problems. By imagining the proposed technology or project primarily in a worst-case scenario—while assuming that *refraining* from action will have no disastrous consequences—the adherents of the principle immediately tilt the playing field in their favor.
Second, the precautionary principle ignores background risk, distracting our attention from established dangers to health. Nature itself brings with it a risk of harms such as infection, hunger, famine, and environmental disruption. We should apply our limited resources first to major risks that we *know* are real, not merely hypothetical. The more we attend to merely hypothetical threats to health and environment, the less money, time, and effort will remain to deal with substantial health problems that are highly probable or thoroughly established. The principle errs in focusing on future technological harms that *might* occur, while ignoring natural risks that are *actually* occurring.
Third, adherents of the precautionary principle assume that proposed regulations and restrictions will cause no harm to health. Yet the very application of the principle itself can endanger our health. Consider, for instance, the consistent correlation between the health of a nation's citizens and their standard of living. Widespread application of the precautionary principle, by hampering economic activity, will tend to reduce living standards and thereby worsen health. In addition, major efforts to eliminate small, speculative risks can unleash far greater and more likely harms.
Fourth, the precautionary principle fails to treat natural and human threats on the same basis. Users of the principle routinely ignore the potential benefits of technology, in effect favoring nature over humanity. The principle does not account for the fact that the risks created by technological stagnation are at least as real as those of technological advancement. As biochemist Bruce Ames of UCLA has demonstrated, almost all of our exposure to dangerous chemicals comes in the form of *natural* chemicals. Yet fear and attention are primarily directed toward *synthetic* chemicals. A particular chemical has the same effects regardless of whether its source is natural or synthetic. Despite this, scientifically unsound activists treat human-derived chemicals as guilty until proven innocent, and naturally occurring chemicals as innocent or insignificant.
Fifth, the precautionary principle illegitimately shifts the burden of proof by positioning advocates of proposed activities or new technologies as reckless, in contrast with the "responsible" advocates of "precaution". The content—even the very name—of the precautionary principle positions environmental activists and Luddites as friends and protectors of the common person. The innovators are made to prove safety, having already been portrayed as indifferent to the common good and interested only in profiting.
Having illegitimately shifted the burden of proof, activists can impose their values without troubling themselves with evidence and without taking responsibility for the results of overly-precautious policies. For example, the Environmental Working Group opposed the use of pesticides, speculating about possible carcinogenic effects of trace amounts of their residues. They do not seem to have taken into account the probability that restricting pesticides would increase cancer rates.
Activists get away with the burden of proof trick by managing *perceptions* of risk instead of examining the real risks. This move is particularly dangerous because we have limited resources to address a multitude of risks. We cannot afford to make decisions driven by manipulated perceptions. It's crucial that we rely on a comprehensive, scientifically grounded perspective when choosing which risks have the strongest claim on our attention.
Sixth, and finally, the precautionary principle conflicts with the more balanced approach to risk and harm derived from common law. Common law holds us liable for injuries we cause, our liability being proportionate with the degree of foreseeable risk. By contrast, the precautionary principle dismisses liability and acts like a preliminary injunction—but without the involvement of a court, without the burden of proof, and without taking responsibility for harm caused by the injunction.[1]

Pro- Proactionary Principle- Precautionary Bad

Progressive politics must revive techo-optimism- Luddism inappropriately equates technology with power relations- technologies can transcend and eliminate these inequalities- and it fails to inspire movements.

Hughes, Bioethicist and sociologist @ Trinity College & Dir IEET; 2002 (John; "Democratic transhumanism 2.0"; http://www.changesurfer.com/Acad/DemocraticTranshumanism.htm)

Why Democrats Should Embrace Transhumanism

Luddism is a political dead-end for progressive politics. Progressives must revive the techno-optimist tradition if they want to achieve the goals of furthering liberty, equality and solidarity.

First, left Luddism inappropriately equates technologies with the power relations around those technologies. Technologies do not determine power relations, they merely create new terrains for organizing and struggle. Most new technologies open up new possibilities for both expanded liberty and equality, just as they open new opportunities for oppression and exploitation. Since the technologies will most likely not be stopped, democrats need to engage with them, articulate policies that maximize social benefits from the technologies, and find liberatory uses for the technologies. If biotechnology is to be rejected simply because it is a product of capitalism, adopted in class society, then every technology must be rejected. The mission of the Left is to assert democratic control and priorities over the development and implementation of technology. But establishing democratic control over technological innovation is not the same as Luddism. In fact, to the extent that advocates for the democratic control of technology do not guarantee benefits from technology, and attempt to suppress technology altogether, they will lose public support.

Second, technology can help us transcend some of the fundamental causes of inequalities of power. Although we will never eliminate inequalities of intelligence and knowledge, the day is not far off when all humans can be guaranteed sufficient intelligence to function as active citizens. One of the most important progressive demands will be to ensure universal access to genetic choice technologies which permit parents to guarantee their children biological capacities equal to those of other children. Technologically assisted birth, eventually involving artificial wombs, will free women from being necessary, vulnerable vessels for the next generation. Morphological freedom, the ability to change one's body, including one's abilities, weight, gender and racial characteristics, will reduce body-based oppressions (disability, fat, gender and race) to aesthetic prejudices.

Third, Left Luddism is boring and depressing; it has no energy to inspire movements to create a new and better society. The Left was built by people inspired by millenial visions, not by people who saw a hopeless future of futile existential protest. Most people do not want to live in a future without telecommunications, labor-saving devices, air travel and medicine. The Next Left needs to rediscover its utopian imagination if it is to renew itself, reconnect with the popular imagination, and remain relevant. The Next Left needs visionary projects worthy of a united transhuman world, such as guaranteeing health and longevity for all, eliminating work, and colonizing the Solar System.

Pro- AT: Shiva- Africa

African plant diseases are as deadly as HIV and TB but Shiva continues to lead opposition to GMOs in African countries.

Specter, writer for New Yorker; 8/25/2014 (Michael; The New Yorker; "Vandana Shiva's crusade against genetically modified crops"; http://www.newyorker.com/magazine/2014/08/25/seeds-of-doubt)

The need for more resilient crops has never been so great. "In Africa, the pests and diseases of agriculture are as devastating as human diseases," Gordon Conway, who is on the board of the African Agricultural Technology Foundation, told me. He added that the impact of diseases like the fungus black sigatoka, the parasitic weed striga, and the newly identified syndrome maize lethal necrosis—all of which attack Africa's most important crops—are "in many instances every bit as deadly as H.I.V. and TB." For years, in Tanzania, a disease called brown-streak virus has attacked cassava, a critical source of carbohydrates in the region. Researchers have developed a virus-resistant version of the starchy root vegetable, which is now being tested in field trials. But, again, the opposition, led in part by Shiva, who visited this summer, has been strong.

Pro- AT: Shiva- Autism

Shiva's autism argument confuses correlation with causation.
Specter, writer for New Yorker; 8/25/2014 (Michael; The New Yorker; "Vandana Shiva's crusade against genetically modified crops"; http://www.newyorker.com/magazine/2014/08/25/seeds-of-doubt)

"That question's been answered," Shiva continued. She mentioned glyphosate, the Monsanto herbicide that is commonly used with modified crops. "If you look at the graph of the growth of G.M.O.s, the growth of application of glyphosate and autism, it's literally a one-to-one correspondence. And you could make that graph for kidney failure, you could make that graph for diabetes, you could make that graph even for Alzheimer's."
Hundreds of millions of people, in twenty-eight countries, eat transgenic products every day, and if any of Shiva's assertions were true the implications would be catastrophic. But no relationship between glyphosate and the diseases that Shiva mentioned has been discovered. Her claims were based on a single research paper, released last year, in a journal called *Entropy*, which charges scientists to publish their findings. The paper contains no new research. Shiva had committed a common, but dangerous, fallacy: confusing a correlation with causation. (It turns out, for example, that the growth in sales of organic produce in the past decade matches the rise of autism, almost exactly. For that matter, so does the rise in sales of high-definition televisions, as well as the number of Americans who commute to work every day by bicycle.)

Pro- AT: Shiva- BT Cotton Genocide

BT cotton decreases pesticide and the number of pesticide poisoning cases by 90%.
Specter, writer for New Yorker; 8/25/2014 (Michael; The New Yorker; "Vandana Shiva's crusade against genetically modified crops"; http://www.newyorker.com/magazine/2014/08/25/seeds-of-doubt)

Everyone had a story to tell about insecticide poisoning. "Before Bt cotton came in, we used the other seeds," Rameshwar Mamdev told me when I stopped by his six-acre farm, not far from the main dirt road that leads to the village. He plants corn in addition to cotton. "My wife would spray," he said. "She would get sick. We would all get sick." According to a recent study by the Flemish Institute for Biotechnology, there has been a sevenfold reduction in the use of pesticide since the introduction of Bt cotton; the number of cases of pesticide poisoning has fallen by nearly ninety per cent. Similar reductions have occurred in China. The growers, particularly women, by reducing their exposure to insecticide, not only have lowered their risk of serious illness but also are able to spend more time with their children.

Indian farmers have a suicide rate that is lower than French farmers and the pattern of changes in suicide rates among Indian farmer demonstrates BT cotton's beneficial effect. Credit issues, and the lack of social security and crop-insurance cause suicides, not BT cotton.
Specter, writer for New Yorker; 8/25/2014 (Michael; The New Yorker; "Vandana Shiva's crusade against genetically modified crops"; http://www.newyorker.com/magazine/2014/08/25/seeds-of-doubt)

The World Health Organization has estimated that a hundred and seventy thousand Indians commit suicide each year—nearly five hundred a day. Although many Indian farmers kill themselves, their suicide *rate* has not risen in a decade, according to a study by Ian Plewis, of the University of Manchester. In fact, the suicide rate among Indian farmers is lower than for other Indians and is comparable to that among French farmers. Plewis found that "the pattern of changes in suicide rates over the last fifteen years is consistent with a beneficial effect of Bt cotton for India as a whole, albeit perhaps not in every cotton-growing state."
Most farmers I met in Maharashtra seemed to know at least one person who had killed himself, however, and they all agreed on the reasons: there is almost no affordable credit, no social security, and no meaningful crop-insurance program. The only commercial farmers in the United States without crop insurance are those who have a philosophical objection to government support. In India, if you fail you are on your own. Farmers all need credit, but banks will rarely lend to them. "We want to send our children to school," Pawar told me. "We want to live better. We want to buy equipment. But when the crop fails we cannot pay." In most cases, there is no choice but to turn to money lenders, and, in villages like Dhoksal, they are often the same people who sell seeds. The annual interest rate on loans can rise to forty per cent, which few farmers anywhere could hope to pay.

Pro- AT: Shiva- Gaia

The Gaia hypothesis/theory presents a moving goalpost that has been thoroughly discredited because it confuses cause and effect.
Ranganathan, author, degree in chemistry, post doc @ Cambridge, & researcher @ the International Center of Genetic Engineering & Biotechnology; 7/26/14 (Anand; News Laundry; "Exploring GM Foods (Part III- The Third Eye of Shiva)"; http://www.newslaundry.com/2014/07/26/exploring-gm-foods-part-iii-the-third-eye-of-shiva/)

"We have to make a choice," pleads Dr Shiva, "Will we obey the market laws of corporate greed or Gaia's laws for maintenance of the earth's ecosystems?" What next – Cultural learnings of Intelligent Design for make benefit glorious nation of farmers? For the uninitiated, Gaia hypothesis states that "Life moderates the planetary environment to make it more favourable for life." In other words, Mother Earth is a throbbing, breathing, living entity complicit in life's propagation itself. Darwin be damned, it is the third rock from the sun that regulates survival of the fittest. Here, then, was yet another hypothesis waiting its turn to shake hands with feminism and environmentalism. It is unfortunate that Dr. Shiva, a Gaia associate and someone who features prominently in Gaia Foundation and Gaia University activities, hasn't found time to acquaint herself with Prof Tyrrell's authoritative discourse on Gaia. His book, *On Gaia: A Critical Investigation of the Relationship between Life and Earth*, lays bare what many scientists have long suspected, that Gaia confuses cause and effect. As one study puts it, "Climate stability might be a precondition for a complex biosphere rather than climate stability being the consequence of a complex biosphere". Richard Dawkins, in his excellent book *The Extended Phenotype* calls Gaia a fatally flawed attempt to apportion evolution onto a web of connections. "It is an extreme form of the BBC Theorem." The planet does not yield an offspring; the planet is not a product of Darwin's evolution; its inhabitants are.
Recently, a supporting hypothesis called CLAW – touted as a validation of sorts for Gaia – was debunked, leaving Gaia-ites gasping for air. But the Pillars of Hercules are constantly being shifted to make Gaia acceptable to the wider scientific community – Gaia Hypothesis, Gaia Theory, and there is even something called a Weak Gaia. Gaia is evolving; the irony isn't lost on some.

Pro- AT: Shiva- Green Revolution/High-Yield Bad

Shiva's blanket criticism of the Green Revolution and high-yield ag ignores the doubling in income, 30% increase in caloric intake, and a quarter reduction in poverty.
Ranganathan, author, degree in chemistry, post doc @ Cambridge, & researcher @ the International Center of Genetic Engineering & Biotechnology; 7/26/14 (Anand; News Laundry; "Exploring GM Foods (Part III- The Third Eye of Shiva)"; http://www.newslaundry.com/2014/07/26/exploring-gm-foods-part-iii-the-third-eye-of-shiva/)

It could very well be that Dr. Shiva's faith in Gaia has allowed her to term India's Green Revolution an unmitigated disaster. "It has often been argued that the Green Revolution provided the only way in which India could have increased food availability. Yet, until the 1960s, India was successfully pursuing an agricultural development policy based on strengthening the ecological base of agriculture and the self-reliance of peasants. The term high-yielding varieties, HYV, is a misnomer". While Dr. Shiva is right to an extent, in that the continuance of practices adopted during the Green Revolution have since caused havoc, it is grossly unfair on her part to label the revolution itself one big failure. Today, almost 100% of Indian wheat lines possess remnants of HYV genes. Between 1970 and 1995, after much of Asia had adopted HYVs, the incomes doubled, calorific intake jumped by 30 per cent, and poverty reduced by a quarter despite steep population growth. It was because of the Green Revolution that many countries including India escaped finally from the clutches of devastating famines. This wasn't always so. Post-independence, hunger and disease were wide-spread leaving us perennially at the mercy of American wheat imports – the so-called PL-480 programme. Many countries doubted our capacity to feed our people; "basket-case", they called us. The HYVs Lerma Rojo-64A, Sonora 63, Sonora 64, and Mayo 64, procured in 1963 from Dr Borlaug changed all that. So when Dr. Shiva claims, "Hunger and malnutrition are hardwired in the design of the industrial, chemical model of agriculture", it is simply not true. We as a nation were saved at the gates of hell by the Green Revolution; we owe a debt of gratitude to those who made it possible. Its dreadful consequences three decades later, evident in Punjab and elsewhere, have their reasons – "It became Greed Revolution not Green Revolution" – but the phenomenal contribution of HYVs to independent India's history cannot be denied.

Green Revolution transformed India from a grain importer to exporter.
Specter, writer for New Yorker; 8/25/2014 (Michael; The New Yorker; "Vandana Shiva's crusade against genetically modified crops"; http://www.newyorker.com/magazine/2014/08/25/seeds-of-doubt)

To become independent in more than name, India also needed to become self-reliant. The Green Revolution—a series of agricultural innovations producing improved varieties of wheat that could respond better to irrigation and benefit from fertilizer—provided that opportunity. In 1966, India imported eleven million tons of grain. Today, it produces more than two hundred million tons, much of it for export. Between 1950 and the end of the twentieth century, the world's grain production rose from seven hundred million tons to 1.9 billion, all on nearly the same amount of land.

Pro- AT: Shiva- Food Totalitarianism

The Bill & Melinda Foundation is not imposing food totalitarianism throughout the world and Indian laws guarantee farmers can save seeds.
Johnson, author & Grist food writer; 8/20/2014 (Nathanael; Grist; "Why Vandana Shiva is so right and yet so wrong"; http://grist.org/food/vandana-shiva-so-right-and-yet-so-wrong/)

Shiva has accused the Bill and Melinda Gates Foundation of "attempting to impose 'food totalitarianism' on the world." That's certainly not the case in the foundation's current incarnation — I looked closely at this issue here.
Shiva also says that Monsanto's patents prevent poor people from saving seeds. That is not the case in India. The Farmers' Rights Act of 2001 guarantees every person the right to "save, use, sow, resow, exchange, share, or sell'' his seeds.

Pro- AT: Shiva- Golden Rice Bad

Shiva miscalculates the amount of vitamin A in Golden Rice and overstates the amount in alternatives. Studies show opposition to Golden Rice in India has already 1.4 million life years lost.
Ranganathan, author, degree in chemistry, post doc @ Cambridge, & researcher @ the International Center of Genetic Engineering & Biotechnology; 7/26/14 (Anand; News Laundry; "Exploring GM Foods (Part III- The Third Eye of Shiva)"; http://www.newslaundry.com/2014/07/26/exploring-gm-foods-part-iii-the-third-eye-of-shiva/)

Dr. Shiva also doesn't like Golden Rice (or Vitamin A rice), a genetically-engineered variety that can provide much-needed Vitamin A to malnourished children in Africa and Asia. "Vitamin A rice is a hoax", she says. "Vitamin A rice will not remove vitamin A deficiency. It will seriously aggravate it. This is a recipe for creating hunger and malnutrition. It appears as if the world's top scientists suffer a more severe form of blindness than children in poor countries." Citing a peer-reviewed study, Dr. Shiva then alleges, "The promoters of Golden rice admit that it produces only 35 micrograms per 100 mg of rice. Biodiversity and ecological agriculture offers us alternatives that are 3500% richer in vitamin A than Golden Rice. Golden Rice will actually decrease Vitamin A availability compared to the alternatives. Table 6.12 Gives sources rich in vitamin A used commonly in Indian foods".
Table 6.12 lists *methi-ka-saag*, *bandh gobi*, and *kaddu* as containing 450, 217, and 120 micrograms of vitamin A per 100 gram portion respectively. Debate over.
Not quite. The Golden Rice portion quoted by Dr. Shiva was in milligrams not grams. Equated to the same SI units, a 100 gram portion of Golden Rice would contain 35,000 micrograms of vitamin A, way beyond *saag* or *kaddu* and comparable to the amount present in cod-liver oil.
Scientific debates, however, are not occasions to gloat over falsifications, deliberate or otherwise. The scientists were talking of 35 micrograms of beta-carotene, *not* vitamin A. For the correct picture one needs to read the citation carefully. It turns out that a 100 gram portion of Golden Rice would provide 500-800 micrograms of retinol (human form of vitamin A) representing 80-100 per cent of Estimated Average Requirements for adults, and that as little as a 50 gram portion would take care of 90% vitamin EAR (275 micrograms retinol per day) for children. Indeed, not only does the Golden Rice portion meet a child's daily requirement, its beta-carotene is as good as the one present in oil at providing vitamin A.
But it was too late. Dr. Shiva's essay went viral and was duplicated on innumerable anti-GMO platforms like Seedfreedom and GMwatch. Needless to say, such deceits act as a tonic for anti-GMO protestors, some of whom take the next logical step of burning and vandalising Golden Rice trial fields. Scientists have estimated that opposition to Golden Rice has resulted in as many as 1.4 million life years lost over the past decade in India.

Pro- AT: Shiva- Imperialism

Shiva condemns some of the most advanced and important medical breakthroughs to the dustbins of imperialism.

Ranganathan, author, degree in chemistry, post doc @ Cambridge, & researcher @ the International Center of Genetic Engineering & Biotechnology; 7/26/14 (Anand; News Laundry; "Exploring GM Foods (Part III- The Third Eye of Shiva)"; http://www.newslaundry.com/2014/07/26/exploring-gm-foods-part-iii-the-third-eye-of-shiva/)

"The invasion and take-over of land as colonies was made possible through the technology of the gunboat; the invasion and takeover of the life of organisms as the new colonies is being made possible through the technology of genetic engineering. Biotechnology, as the handmaiden of capital in the post-industrial era, makes it possible to colonise and control that which is autonomous, free and self-regenerative."
Insulin, Hepatitis vaccine, Antibiotics, Erythropoietin, Herceptin, Taxol, Stem cells – consigned all to the dustbin of imperialism.

Pro- AT: Shiva- Patents

Mustard is an example of a publicly funded and owned GMO that is important in vegetarian diets since GMO mustard oil is high in omega-3.
Specter, writer for New Yorker; 8/25/2014 (Michael; The New Yorker; "Vandana Shiva's crusade against genetically modified crops"; http://www.newyorker.com/magazine/2014/08/25/seeds-of-doubt)

Mustard is grown on six million hectares in India. There are parts of the country where farmers raise few other crops. "We have developed a line of mustard oil with a composition that is even better than olive oil," he said. "It has a lot of omega-3 in it, and that is essential for a vegetarian food"—not a minor consideration in a country with half a billion people who eat no meat. The pungency that most people associate with mustard has been bred out of the oil, which is also low in saturated fats. "It is a beautiful, robust system," he said, adding that there have been several successful trials of the mustard seed. "All our work was funded by the public. Nobody will see any profits; that was never our intention. It is a safe, nutritious, and important crop." It also grows well in dry soil. Yet it was made in a laboratory, and, two decades later, the seed remains on the shelf.

Pro- AT: Shiva- Qualifications

Shiva's qualifications as a physicist are exaggerated.
Ranganathan, author, degree in chemistry, post doc @ Cambridge, & researcher @ the International Center of Genetic Engineering & Biotechnology; 7/26/14 (Anand; News Laundry; "Exploring GM Foods (Part III- The Third Eye of Shiva)"; http://www.newslaundry.com/2014/07/26/exploring-gm-foods-part-iii-the-third-eye-of-shiva/)

And so, a physics MSc graduate who had earned her PhD in philosophy became a scientist: "Yes, I am an ecologist and feminist. But I am also a scientist…a trained Quantum Physicist" . The philosopher also never bothered to correct gushing interviewers and a hundred others from churning out artful biographical sketches -"…Vandana would follow her hero, Albert Einstein. She would become a physicist…Nuclear physics was Dr Shiva's chosen specialty…", or "Dr. Shiva completed her PhD on the 'Hidden Variables and Non-locality in Quantum Theory'…"
The makeover was complete. Forbes called her one of the seven most powerful feminists, lecture-circuit agencies made a beeline eager to cash in, with universities allegedly paying as much as $ 40,000 and a business class ticket to hear her. She was even nominated for the Nobel Peace Prize.

Shiva has never worked as a physicist.
Specter, writer for New Yorker; 8/25/2014 (Michael; The New Yorker; "Vandana Shiva's crusade against genetically modified crops"; http://www.newyorker.com/magazine/2014/08/25/seeds-of-doubt)

Shiva refers to her scientific credentials in almost every appearance, yet she often dispenses with the conventions of scientific inquiry. She is usually described in interviews and on television as a nuclear physicist, a quantum physicist, or a world-renowned physicist. Most of her book jackets include the following biographical note: "Before becoming an activist, Vandana Shiva was one of India's leading physicists." When I asked if she had ever worked as a physicist, she suggested that I search for the answer on Google. I found nothing, and she doesn't list any such position in her biography.

AT: Shiva- Rape

Shiva's rape analogy trivializes it while devaluing women, men & children.
Specter, writer for New Yorker; 8/25/2014 (Michael; The New Yorker; "Vandana Shiva's crusade against genetically modified crops"; http://www.newyorker.com/magazine/2014/08/25/seeds-of-doubt)

Perhaps nobody was more incensed by Lynas's conversion than Shiva, who expressed her anger on Twitter: "#MarkLynas saying farmers shd be free to grow #GMOs which can contaminate #organic farms is like saying #rapists shd have freedom to rape." The message caused immediate outrage. "Shame on you for comparing GMOs to rape," Karl Haro von Mogel, who runs Biology Fortified, a Web site devoted to plant genetics, responded, also in a tweet. "That is a despicable argument that devalues women, men, and children." Shiva tweeted back at once. "We need to move from a patriarchal, anthropocentric worldview to one based on #EarthDemocracy," she wrote.

Pro- AT: Shiva- Seed Prices

BT cotton-seeds prices are falling not rising.
Specter, writer for New Yorker; 8/25/2014 (Michael; The New Yorker; "Vandana Shiva's crusade against genetically modified crops"; http://www.newyorker.com/magazine/2014/08/25/seeds-of-doubt)

Shiva contends that modified seeds were created almost exclusively to serve large industrial farms, and there is some truth to that. But Bt cotton has been planted by millions of people in the developing world, many of whom maintain lots not much larger than the back yard of a house in the American suburbs. In India, more than seven million farmers, occupying twenty-six million acres, have adopted the technology. That's nearly ninety per cent of all Indian cotton fields. At first, the new seeds were extremely expensive. Counterfeiters flooded the market with fakes and sold them, as well as fake glyphosate, at reduced prices. The crops failed, and many people suffered. Shiva said last year that Bt-cotton-seed costs had risen by eight thousand per cent in India since 2002.
In fact, the prices of modified seeds, which are regulated by the government, have fallen steadily. While they remain higher than those of conventional seeds, in most cases the modified seeds provide greater benefits. According to the International Food Policy Research Institute, Bt farmers spend at least fifteen per cent more on crops, but their pesticide costs are fifty per cent lower. Since the seed was introduced, yields have increased by more than a hundred and fifty per cent. Only China grows and sells more cotton.

Con- Capitalism Bad—Agriculture

Capitalism inflates the demand for meat which causes supply chain stress, mal-distribution, hunger
Weis, Dept. of Geography, Univ. of Western Ontario, July 2010 (Tony, *Journal of Agrarian Change*, vol. 10, no. 3, p. 322)

Another crucial dimension of the mechanization-driven need for biological simplification and standardization is the physical separation of crops and animals, the ascension of factory farms over integrated, small-scale animal husbandry, and the cycling of rising volumes of grains and oilseeds through growing livestock populations. Profit-making opportunities in value-added commodities, together with the assumptions about meat and modernity noted earlier, have stoked the 'meatification' of human diets. The average person today consumes 75 per cent more meat than a half-century ago. While this conceals huge disparities, it nevertheless reflects a less commonly recognized population explosion: livestock, which has long dwarfed human population growth. Roughly 90 per cent of the world's total volume of animal flesh comes from pigs, chicken and cattle, with the share of the world's pig and chicken meat raised in intensive confinement rising sharply in recent decades. Because global livestock populations now far exceed stocking capacities on rangelands and pasturing on small, integrated farms, the continuing meatification of diets cannot happen without the continued growth in factory farming and the cycling of industrial grains and oilseeds through livestock (Nierenberg 2005; Steinfeld et al. 2006; Weis 2007).

Biofuel and livestock competition for grain exacerbates hunger and food shortages
Weis, Dept. of Geography, Univ. of Western Ontario, July 2010 (Tony, *Journal of Agrarian Change*, vol. 10, no. 3, p. 328)

Though this trajectory obviously threatens to intensify competition for food supplies in the future, the effective demand for grains and oilseeds as food is driven primarily by population growth, while failing to register the more than one billion malnourished people in the world. In the short term, this means that intensifying demand in world grain and oilseed markets primarily comes from biofuel and livestock production. The biofuel boom is already having a major impact on global demand for grains and oilseeds. In 2006–7 alone, when food prices were spiking, the volume of coarse grains given to biofuels increased by 15 per cent, a rise equivalent to roughly half the draw-down of global grain stocks (Economist 2007; Halweil 2008a).20 US ethanol production grew roughly seven-fold from 1998 to 2008, during which time the share of US maize production devoted to ethanol increased from 5 to 25 per cent (RFA n.d.; US Department of Energy n.d.).

Con- Democracy

Citizens have been excluded from the decision-making process regarding GM food
Du, Harvard Law School, Fall 2012 (Dorothy, *Harvard Journal of Law & Technology*, vol. 26, no. 1, p. 391)

The FDA's GMO labeling policy is illustrative. Despite overwhelming support for labeling of GMOs, the regulatory scheme has not — and cannot — integrate these public opinions into policy because GMOs are "substantially similar" to conventional foods under the adopted standard. The regulatory scheme's reliance on specialized perspectives has prompted the observation that laypeople have been cut out of the debate, despite their stakeholder status. The problem lies in the fact that the government has "implicitly or covertly" adopted a set of normative views, sidestepping the democratic process by using policy documents like the Framework to direct agency regulation.

Regulation process deflects public scrutiny
Du, Harvard Law School, Fall 2012 (Dorothy, *Harvard Journal of Law & Technology*, vol. 26, no. 1, p. 391)

As long as regulatory agencies can frame their decisions as science-based, agency experts can simply preclude non-experts and non-scientists from participating in government decision-making. The public cannot hold these scientists accountable for misinformed, under-informed, or biased decisions. Even well-intentioned scientists are ill-qualified to make determinations about the types and levels of risk acceptable to the public because non-scientific issues lie outside of their training and expertise.

GMO's are an issue for democracy – We must demand change and the right to have freedom of seed, food while challenging corporate control over the seed industry
Shiva '11 (Vandana-physicist, environmentalist, and campaigner for sustainabilitiy and social justice. Director/Founder of The Research Foundation for Science, Technology and Ecology and Director/Founder of Navdanya, author of numerous books, "The GMO Emperor has No Clothes: A Global Citizens Report on the State of GMO's – False Promises & Failed Technologies, http://www.panna.org/sites/default/files/GMOemperorHasNoClothes.pdf)
This is why GE crops are an issue for democracy. Food democracy is everyone's right and responsibility. We have food democracy when we can exercise our choice to have GMO free seed and food. This choice is being undermined as seed is genetically engineered and patented, as food systems are increasingly controlled by giant corporations, as chemical pollution and genetic pollution spread uncontrolled, making our food unsafe. Each of us must defend our food freedom and urge our governments to protect the rights of their citizens and stop supporting corporate takeover of our seeds and foods. Each of us is vital in creating food democracy. We invite you to join us to defend the most fundamental freedom: our food freedom.

Con- Gene-Patenting Bad

Gene-patenting fuels the growth of industrial agriculture
Du, Harvard Law School, Fall 2012 (Dorothy, *Harvard Journal of Law & Technology*, vol. 26, no. 1, p. 387)

The patentable status of GMOs has played a crucial role in precipitating a shift in the agriculture industry towards large agribusiness. Increasingly, multinational corporations with little connection to local farmers or consumers control the food supply. Patents and other intellectual property rights have facilitated this process by enabling companies to control GM seeds and herbicides designed for use with GM crops. In the 1970s, for example, the Plant Variety Protection Act spurred an important merger and acquisition movement that left a predominant share of intellectual property rights over plants in the hands of a few corporations, including Cargill, Monsanto, Occidental Petroleum, and Shell Oil.

Con- Industrial Ag Bad

GM crops are a flawed approach and entrench reliance on science, must question the entire system
Ostrander, staff-writer, 9-1-2014 (Madeline, *The Nation*, vol. 299, no. 9-10, p. 27)

When I described Blumwald's research, however, Henson was skeptical. "The biotech solution is to change out one variety of one crop with another single variety that's somehow more adapted by genetic engineering," he said, while the approach to climate change, drought and other related issues "should be about the whole farm system."
And that's the major area of disagreement between food activists and the farm industry: people like Henson believe the entire system of modern agriculture needs a radical make-over to rely less on fossil fuels, irrigation, and the chemical fertilizers and weed killers that are fouling water sources from the Great Lakes to the Mississippi. Tweaking a gene won't fix all that, Henson argues: "The solution has got to be a return to a more sustainable, soil-focused agriculture."

Industrial agriculture harms earth and people in many ways, should transition to sustainability
Bowness, Prof. at Univ. of Manitoba-Winnipeg, Jan/Feb 2014 (Evan, *Canadian Dimension*, vol. 47, no. 7, p. 34)

With the industrial revolution came the development of technologically complex and energy-intensive food systems capable of producing previously unthinkable quantities of food. In particular, the "green revolution" from the 1940s to late 1960s resulted in a new standard in agriculture: immense monoculture crop production operations that employ a range of fossil fuel-based strategies, including applications of herbicides, pesticides, fungicides and chemical fertilizers. This approach to producing food entailed some unforeseen challenges. For instance, with global petrochemical production nearing -- or already having passed -- its peak, the costs associated with making these products are expected to rise. At the same time, using them can harm beneficial microbes in the soil which are required for healthy plant development and the possibility of long-term crop yields. Industrial agriculture has also been increasingly marked by high-density "factory farming" and with it such problems as the unethical treatment of animals, the overuse of antibiotics, and the contamination of waterways by concentrated waste runoff. Then there are problems associated with how the food we produce is distributed. With the globalization of food markets, producers with a competitive advantage grow crops or raise animals bound for buyers thousands of miles away. The growing price tags of transporting food are making the turn to more sustainable local-food options ever more desirable.

Con- Industrial Ag Bad—Capitalism

Industrial agriculture's marriage to consumer capitalism divorces people from food ethics
Weis, Dept. of Geography, Univ. of Western Ontario, July 2010 (Tony, *Journal of Agrarian Change*, vol. 10, no. 3, p. 317)

The hegemonic power of industrial capitalist agriculture is further augmented by the control of transnational corporations (TNCs) over surplus value and decision making. The growth and consolidation of agro-input TNCs (chemicals, fertilizers, seeds and animal pharmaceuticals) and agro-food TNCs (processing, distribution and retailing) have reduced options for both farmers and consumers. Agro-food TNCs have been particularly powerful not only in a material sense but at an ideological level, transforming dietary aspirations and cultivating strong brand loyalties. Here, commodity fetishism weighs heavily. That is, as food is progressively transformed into a highly branded, packaged and de-spatialized commodity, and severed from time, space and culture (or season, landscape and meaning), it shifts for many into the moral unconscious. Modern supermarkets teeming with 'pseudo-variety' are the cathedrals of this mystification (Weis 2007).

Industrial agriculture is overly reliant on oil and, by extension, the military
Weis, Dept. of Geography, Univ. of Western Ontario, July 2010 (Tony, *Journal of Agrarian Change*, vol. 10, no. 3, p. 318)

As a general rule, industrial economies of scale depend upon the standardization of production, the breaking down of work into smaller, more regular tasks, and the substitution of labour with technology wherever possible. A central tenet of capitalist economics is that economies of scale are synonymous with enhanced efficiency, an assumption that has typically been accompanied by little or no attention to the central and unsustainable role of fossilized biomass – ancient and irreplaceable stores of solar energy – and the impact that its combustion has on the carbon cycle and ultimately the atmosphere.
On a global scale, oil, natural gas and coal account for four-fifths of the total primary energy supply (for production, household/domestic use and transportation), with oil the most pivotal. Oil provides more than one-third of the world's primary energy and virtually all of the liquid fuel that powers transportation systems (Heinberg 2005; IEA 2008). The failure to account for the atmospheric burden associated with fossil energy, and its impact on the Earth's climate system, represents one of the most fundamental biophysical contradictions of industrial capitalism. The relatively cheap price of oil has been further subsidized by the US military industrial complex, various military and political interventions and enduring tensions, such that both industrial scale and the compression of time and space might be described as having a great 'geopolitical externality'.

Con- Industrial Ag Bad—Environment

Industrial agriculture is doomed to fail—environmental harms cascade threatening the whole system Weis, Dept. of Geography, Univ. of Western Ontario, July 2010 (Tony, *Journal of Agrarian Change*, vol. 10, no. 3, p. 316)

Other externalized costs, however, are deeply contradictory in that they mask the deterioration of the very biophysical foundations of agriculture. These include the undervaluation of the damage associated with: soil erosion and salinization; the overdraft of water and threats to its long-term supply; the loss of biodiversity and crucial 'ecosystem services' (e.g. pollination, soil formation); and greenhouse gas (GHG) emissions. In addition, there is a failure to account for the intractable dependence of industrial methods upon a finite resource base, particularly fossilized biomass. All of these biophysical contradictions – or sources of long-term instability – are magnified by the increasing intensity and volume of livestock production. Because so much usable nutrition is lost in cycling feed through animals agriculture's 'footprint' in the landscape necessarily expands as per capita meat production rises beyond the densities of small integrated farms and non-cultivatable pasture, as does the use of energy and agro-inputs (Weis 2007). An expanding 'ecological hoofprint' is thus implicated in the loss of forests, grasslands and wet lands, which has a major impact on the carbon cycle, both in the release of carbon as diverse ecosystems are converted to agriculture, and in the diminished capacity for carbon sequestration. The world's livestock population is also a leading source of two other GHGs, methane and nitrous oxide, which are much smaller by volume than carbon dioxide but more potent per unit. When this atmospheric burden is aggregated, the growth in global livestock population emerges as one of the largest contributors to climate change (Steinfeld et al. 2006; IPCC 2007a; McIntyre et al. 2009), which again fails to register in the conventional conception of productivity.

Con- Industrial Ag Bad—Health

Industrial agriculture poses human health concerns and pervasive psychological violence
Weis, Dept. of Geography, Univ. of Western Ontario, July 2010 (Tony, *Journal of Agrarian Change*, vol. 10, no. 3, p. 316)

However, the celebrated efficiency of industrial capitalist agriculture must also be seen to depend on an array of un- and undervalued costs. Some of these costs can be easily ignored and externalized, without posing a threat to the operative logic of the system. These include: the contribution to chronic epidemiological problems (e.g. obesity, cardiovascular disease) and the extensive burden on health-care systems; the costs of managing and responding to disease threats such as swine and avian flu, listeriosis, E. coli and mad cow; the diffuse impacts of fertilizer, chemical and other waste runoff from industrial monocultures and factory farms on terrestrial and aquatic ecosystems and human health; the associated costs of water treatment; an assortment of workplace health concerns (e.g. high rates of repetitive stress and accidental injuries); the psychological violence associated with factory farms and industrial slaughterhouses; chemical-laden environments; and the immeasurable suffering of rising populations of animals reared in intensive confinement, along with the unquantifiable ethical issues that this entails.

Con- Industrial Ag Bad—Soil

Industrial agriculture cannot solve long-term, degrades soil
Weis, Dept. of Geography, Univ. of Western Ontario, July 2010 (Tony, *Journal of Agrarian Change*, vol. 10, no. 3, p. 320)

Agriculture poses particularly difficult problems for industrial-scale production. Though farmers have long wrestled with declining soil fertility and problems posed by insects, weeds, fungi and diseases, the biological simplification and standardization needed for industrial production magnifies these problems and necessitates the chronic use of a range of biophysical overrides, or what amount to perpetual short-term 'fixes'. Soil degradation has had widely destabilizing impacts through history; as Montgomery (2007, 81) puts it, 'neglect of the basic health of the soil accelerated the downfall of civilization after civilization'. However, an array of industrial dynamics have dramatically increased the magnitude and pace of soil degradation, such as: the use of ever larger and faster machines in ploughing, planting, spraying and fertilizing; the over-irrigation of land; the reduction of ground cover between rows; and declines in practices of fallowing, as time horizons shorten and livestock is moved from pastures into factory farms to expand and intensify its production. These soil problems get larger still, given how the land space needed for agriculture grows with the expanding ecological hoofprint.

Soil-mining is wasteful and contributes to environmental stress
Weis, Dept. of Geography, Univ. of Western Ontario, July 2010 (Tony, *Journal of Agrarian Change*, vol. 10, no. 3, p. 320)

The problem of soil mining in industrial capitalist monocultures has primarily been overridden by the application of external sources of nitrogen, phosphorous and potassium (McKenney 2002).The loss of nitrogen is the most crucial limitation, and its fix has depended on the natural gas based manufacture of synthetic fertilizer, through the famous Haber–Bosch method of combining atmospheric nitrogen and hydrogen. Synthetic nitrogen fertilizer represents nearly 60 per cent of all fertilizer consumed in the world, and more than half of this is devoted to cereal crops (Gilland 2002). The manufacture of synthetic nitrogen fertilizer alone is a major source of total energy consumption and GHG emissions (both carbon dioxide and nitrous oxide) in industrial agriculture. The fix for phosphorous and potassium loss is based upon fossil fuel powered phosphate ore and potash mining, with extraction and refining processes generating considerable further environmental costs (McKenney 2002), while the phosphorous fix hinges on a finite supply. The energetic and atmospheric costs from fertilizer manufacture are augmented by the energy needed to transport a bulky product from factory or mine to field and to apply it across wide areas. The soaring application of inorganic fertilizer has been fundamental to the tremendous yield gains in industrial agriculture, with the rate of growth in fertilizer consumption dwarfing the rate of growth in yields since the mid-twentieth century (Brown 1996). Further, the rates of yield gains were much greater in the 1960s and 1970s, and began slowing down while fertilizer inputs were still growing (this 'exhaustion' of Green Revolution yield gains is used as an argument by advocates of genetic modification).

Con- Industrial Ag Bad—Rethink

Industrial agriculture is responsible for food risks now, must re-orient toward sustainability
Weis, Dept. of Geography, Univ. of Western Ontario, July 2010 (Tony, *Journal of Agrarian Change*, vol. 10, no. 3, p. 334)

Though it is not always understood in this way, the conceptualization of agricultural productivity – and with it, the efficiency gains of industrial agriculture – is an ideological exercise. As has been emphasized, various unaccounted costs underpin industrial agriculture's exceptionally high levels of productivity per unit labour, plant and animal, and with it the ability to cycle increasing volumes of monoculture grains and oilseeds through concentrated livestock populations, and now cars. A very different conception of productivity would emerge, including a much greater range of measurable costs and 'outputs', if agricultural systems were designed with goals such as minimizing GHG emissions, soil erosion, toxicity, unhealthy food, violence and humanity's overall footprint in the landscape and atmosphere, and maximizing soil conservation and the land space for forests, wetlands, carbon sequestration, soil formation, aquifer recharge, wildlife habitat and human recreation. The need to radically restructure agriculture is at the very core any hope of making the 'human relation to the earth' more ecologically sustainable.

Con- Precautionary Principle- Good

The Precautionary Principle solves for the disconnect between science, the public and companies, and allows for a new dialogue that takes into account existing problems in order to establish what is the most ethical and responsible way to move forward with GMOs

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The cases presented, biodiversity loss, GMO, electromagnetic radiation, and Arctic climate change impacts, can all be considered as situations calling for post-normal approaches since they have in common that facts are uncertain, values in dispute, stakes high and decisions urgent. The strong uncertainty, scientific disagreements, inconsistency of values, and economic interests involved in the cases are also illustrative on how precautionary thinking enters 'wicked cases' (Turnpenny et al., 2009). A common feature of the cases discussed is the importance of the deliberative processes, however, the cases differ widely in the degree of plural participation and involvement in these processes.

The framework suggested by the 'Late lessons from early warnings' can suggest important strategies for providing 'early warnings' in situations of strong uncertainty, as exemplified by GMO, electromagnetic radiation, biodiversity loss, and climate change impacts in the Arctic. The precautionary approach suggested by 'Late lessons from early warnings' recognises the importance of taking into account 'unknown' risks, providing adequate monitoring of 'early warnings', identifying 'blind spots', gaps in knowledge and interdisciplinary obstacles in science, evaluating alternative options, identifying stakeholder values and conflicting interests, maintaining regulatory independence, and reducing institutional obstacles to learning and action (EEA, 2001).

From the pragmatic viewpoint of piece-meal improvements of scientific knowledge-generating processes and political and regulatory decision-making bodies, it is suggested to initiate and strengthen procedures that will permit meaningful and public deliberation about whether the (strongly uncertain) harm is morally acceptable or not, to argue for the capacity and urgency to act on available knowledge, and to enhance the knowledge basis by early warnings signals of emerging uncertainties and irreversible consequences.

What is called for is a continued effort towards establishing extended participation and peer-review processes that involve both scientists and other interested and impacted parties. Public deliberation is needed for discussions around the moral weight to be accorded to uncertain harms in the different circumstances. Furthermore, the cases considered in this article do also call for deliberation on safety as a complex post-normal concept, which, in the words of Ravetz (2003), is at once pragmatic, recursive and ethical.

Con- Precautionary Principle- Capitalism/Monopolies

Precautionary Principle would allow shareholders to take a different look at their companies' effects on the world. It opens new forms of thought and communication that allows for a more holistic approach to the problems of GMO's

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It must be expected that stakeholders use different conceptual frameworks, defined as a set of basic beliefs, values, attitudes and assumptions creating a frame through which they see themselves and the world, in their identification of which values that are important to pursue or protect. For instance, the approach to food security would be not only to promote adoption of GM crops, but also to argue that food security must include promoting environmentally sound improvement in traditional agriculture, innovations in organic farming, and preservation of genetic diversity in agriculture.

An integrated assessment approach involves the handling of technical facts (and uncertainties) and social issues that almost always are incommensurable since it is difficult to construct precise distinctions between empirical facts and value judgements (Giampetro et al., 2006). Multi-criteria methods have been suggested as useful non-monetary evaluation tools for mapping divergent social preferences, and have been developed as software based technique (Munda, 2004). However, the intention with the method is not to find the best solution to a problem, but to explore the links between scientific/expert analysis and divergent social values and interest. The method may provide important insights to policy makers, as it promotes deliberative and participatory processes in situations with uncertainties, divergent values and interest since it involves mapping the plurality of scientific and socio-political perspectives on a problem. For instance, Mayer and Stirling (2002) have used multi-criteria mapping in a pilot study of GM crops in the UK, and they identified several elements of a precautionary approach, such as diverse approaches, acknowledging the many sources of uncertainty, transparency of risk assessment methods, systematic consideration of claimed benefits and risk on a comparative basis, and participation of all affected parties. Multi-criteria methods help to 'open up' the evaluation process and thereby strengthen the information base upon which future choices can be made by raising the awareness about the plurality of solutions that exist for a specific problem.

Calling for post-normal approaches to the socio-economic evaluation and political decision-making for GMO technology adoption reflects the strong uncertainty, high stakes, diversity of values and urgency of decisions involved in these issues, with far-reaching consequences for food security and agricultural options. Extending the paradigmatic context of more mainstream approaches, ecological economics can provide a reflexive and precautionary approach encompassing environmental responsibility, the interrelationship between environmental and human well-being. This involves putting in place procedures that will enhance the possibility to detect early warnings signals of emerging uncertainties and irreversible consequences and that permit inclusion of different scientific disciplines to broaden the scientific understanding. Public involvement is also needed for identification of whether the technology holds its promises or produces (uncertain) harm, and an evaluation of whether the (uncertain) harms are morally acceptable or not.

Con- Precautionary Principle- Democracy

Differences in schools of thought with how to deal with the effects of GMOs mean we need a more inclusive approach. The Precautionary principle is a way to bridge the gap and open up a level of communication

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The uncertainties of environmental and health impacts of GMOs are intertwined with economic and social uncertainties (Batie and Ervin, 2001). Those who are concerned would raise questions like: What about distributional and ethical issues, contested benefits, and choice of discount rate? Adoption of GMO crops has primarily been motivated from the production side, rather than from consumer demand, referred to as 'technology-push' rather than 'demand-pull' (Batie and Ervin, 2001). The Benbrook (2009) report examined some likely consequences for US farmers of Roundup Ready (RR) wheat adoption, and found that increased seed and herbicide costs and reduced wheat prices may outweigh the savings from simplified weed management. Drawing on USDA collected data, Benbrook estimated that introduction of GM-crops has increased the overall use of chemical pesticides considerably from 1996 to 2008, as compared to what would likely have been applied for non-GM crops.

Manufacturing of GM seeds takes place in an industrial structure characterised by strong integration of seed and herbicide production (Zilberman and Lipper, 2005). If a technology is introduced to replace a previous technology causing environmental problems, new problems associated with the new technology may readily be overlooked, as described in the framework of 'Late lessons from early warnings' (EEA, 2001). In the context of GMO uncertainty, the purpose of the 'late lessons' is to serve as reminders of 'blind spots', gaps in knowledge, and conflicting interests, not usually taken into account in the communication within science and between science and policy (Aslaksen et al., 2006). A survey of 'red flag events' in the history of GMOs shows that early (and later) warnings have increasingly been detected by independent scientists as well as NGOs (Lotter, 2009a).

Environmental uncertainty related to GMO can be understood not only as a lack of scientific knowledge, but also as lack of coherence between competing scientific disciplines, each with their traditions, approaches and models [Sarewitz, (2004), p.391]: "Yet on another level that was never discussed, the disciplinary structure and disunity of science itself was at the roots of the controversy. The two sides of the debate represented two contrasting scientific views of nature – one concerned about complexity, interconnectedness, and lack of predictability, the other concerned with controlling the attributes of specific organisms for human benefit. In disciplinary terms, these competing views map onto two distinctive intellectual schools in life science – ecology and molecular genetics."

Each scientific discipline hence represents a different frame for perception of environmental uncertainty. Molecular biologists refer to the controlled laboratory practice, plant biologists refer to the history of conventional plant breeding, while ecologists argue that the experiences based on the introduction of novel species into new environments need to be the basis for risk assessment of GMOs. The values and implicit normative assumptions need to be fully articulated in order to interpret to what extent a particular scientific disagreement represents 'lack of knowledge' or 'lack of coherence' in the interpretation of strong uncertainties.

An inclusive perspective is to develop precautionary approaches that recognise the complex nature of environmental qualities and uncertainties. Employment of model-based decision support, as for instance the Walker et al. (2003) (W&H) framework, may help to identify the types and levels of the uncertainty involved in environmental decision-making, in order to stimulate communication between the actors in the decision processes. Krayer von Krauss et al. (2004) have used the W&H framework to identify scientists' and other stakeholders' judgement of uncertainty in risk assessment of GM crops. The respondents had to quantify the level of uncertainty (ranging from 'knowing for certain' to 'complete ignorance') and identify the nature of uncertainty (whether uncertainty stems from inherent system variability and complexity or from lack of knowledge).

Con- Precautionary Principle- GMOs Bad

The Precautionary Principle solves the problems with GMOs

Applegate '01 (John S., Walter W. Foskett Professor of Law @ Indiana University School of Law-Bloomington Indiana, Indiana Journal of Global Legal Studies, Vol. 9 Issue 1 Article 11, "The Prometheus Principle: Using the Precautionary Principle to Harmonize the Regulation of Genetically Modified Organisms", 10/01/01, http://www.repository.law.indiana.edu/ijgls/vol9/iss1/11)

The precautionary principle envisions a range of regulatory responses, and so a precautionary regime could respond to GMOs in several ways. While serious concerns have been raised about the technology, there is little to indicate that all (or even most, or any) uses will result in an uncontrolled, catastrophic chain reaction. If we are concerned with the irreversibility of introducing GM species into the wild, very strict prerelease testing may be quite sufficient to address the risk.255 In addition, some products or species may pose more serious risks than others.2 56 The recently released studies of Bt maize showed that the pollen of one GM variety was far more toxic to nontarget butterflies than others.257 Clearly, it would be entirely reasonable to regulate that variety more strictly or even to prohibit it.258 Similarly, GM fish are nearly impossible to contain and may have particularly undesirable effects on wild populations. 259 They, too, could reasonably be subject to special controls or entire restriction, even though other, less mobile species (plants, for example) are not.

Countervailing risks260 are also relevant to response. Regulation of risk tradeoffs may be implicit in the absence of public outcry over GM insulin, and no sensible regulatory scheme would reject an effective AIDS vaccine merely because of its GM origin. Even where the benefits are great, however, the precautionary principle counsels at least as much skepticism in evaluating claimed benefits (a characteristic notably absent in the pro-GMO literature) as claimed risks. 26 1 Thus, the precautionary principle offers an alternative to the product *versus* process-based regulatory regimes. While the principle may be triggered on a process basis, individual products can be separately evaluated.262 The initial concern is raised by the GM process, but the danger is expressed by individual products. Those dangers may vary for any number of reasons, and the response should vary accordingly.

Finally, decisions to permit or restrict GMOs should be subject to re-visitation. The new EU directive on GMO releases, for example, affirms an iterative approach, specifying that initial rejection is without prejudice to later acceptance.263 If, as anti-GMO activists like to say, we are engaged in a huge experiment with genetic modification, then presumably we will learn something from it. What we see (or do not see) now or in five or ten years will not, of course, be definitive-but it will be more than we know now, and it should be part of our ongoing decisions. From this perspective, both proponents' haste to bring GMOs to market and opponents' destruction of field tests prevent the kind of learning that is necessary to assure safety.264

The precautionary principle, in sum, can help to bridge the gap between the Frankenstein and Better Living Through Chemistry legal regimes, because it recognizes the regulatory validity of unproven (but not unfounded) dangers, and it sets in motion a process for resolving them, all the while holding the activity in appropriate abeyance to avoid irreversible harm. The precautionary principle may be a call to move slowly with GMOs, but it is by no means a call to ban them in all cases and forever.

Con- Precautionary Principle- Regulate GMOs

The Precautionary Principle should be applied to GMOs

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GMOs are a good candidate for the application of the precautionary principle. With respect to the trigger, serious hazards have been identified. While most are still "over the horizon," they are not without a basis in scientific theory or unsupported by empirical evidence. Moreover, GMOs are not just persistent, a characteristic of which we are already particularly wary; they *propagate* in the environment, raising the serious potential for irreversibility on the model of exotic species.2 5'

As to timing, uncertainty surely exists in the imprecision of the technologies, in the size of the genetic leaps that GM technology can make relative to conventional breeding, and in the complexity of the genetic and ecological systems into which these substances are introduced. This situation was forecast, and precautionary measures ratified, in the landmark *Ethyl Corp.* case:

Where a statute is precautionary in nature, the evidence difficult to come by, uncertain, or conflicting because it is on the frontiers of scientific knowledge, the regulations designed to protect the public health, and the decision that of an expert administrator, we will not demand rigorous step-by-step proof of cause and effect. Such proof may be impossible to obtain if the precautionary purpose of the statute is to be served. Of course, we are not suggesting that the Administrator has the power to act on hunches or wild guesses. . . . However, we do hold that in such cases the Administrator may assess risks. He must take account of available facts, of course, but his inquiry does not end there. The Administrator may apply his expertise to draw conclusions from suspected, but not completely substantiated, relationships between facts, from trends among facts, from theoretical projections from imperfect data, from probative preliminary data not yet certifiable as "fact," and the like. We believe that a conclusion so drawn may, if rational, form the basis for health-related regulations under the "will endanger" language [of the Clean Air Act].252

Ethyl does not anticipate a shift in the burden of proof, but it, like the precautionary principle, permits regulation in the face of uncertainty. GMOs do push the envelope of the precautionary principle, because *both* the causal relationships and the harm itself are uncertain. This is not, for example, like endocrine disrupters, where endocrine-based harms have been observed and only the relationship to chemicals is unproven.253 But it is closely analogous to the original ozone controls, which were adopted in advance of observed effects, on the basis of a scientific theory of the causal interaction between chlorofluorocarbons and stratospheric ozone.254

Con - Capitalism Link & Impact - Monopolies

Corporations are using globalization and the local elites to take control of the seed industry – The negative impact is only felt by the local farmers – increase costs, increase debt, suicide, economically unsustainable and ecologically unsustainable

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The report on "seeds of suicide", which we have been updating since 1997, covers three aspects of the impact of the new policies of the so called "liberalisation" of the seed sector. Firstly, it shows that the trends towards privatisation and concentration of the seed industry and displacement of farmer varieties. A shift from government control to farmers control was the option foregone at the national level. The consequences of giving seed companies a free hand through privatisation and deregulation has been increasing the costs of seeds and agrichemicals for farmers, increasing farm debts and increasing crop failure. Farmers suicides are the extreme result of these policies of market freedom. Farmers are falling prey to the marketing strategies of seed companies.

Globalisation is leading to the emergence of a new kind of corporate feudalism – the convergence of global market forces with the worst forms of feudal control. The removal of the public sector and the undermining of the community in the seed supply has allowed the reemergence of the feudal power of land lords and moneylenders, empowered by global corporations, their products and their capital. This Corporate power is working through feudal structure to capitalise seed markets. The seed and agrichemical companies use the local rural elite, the land lords and money lenders for selling seeds and pesticides for providing credit to poor peasants for buying those high cost inputs. This Corporate feudalism is leading to an epidemic of suicides. It has rendered agriculture socially, economically and ecologically non-sustainable.

Con - Capitalism Link - Monopolies

The US is pushing for new legislation to protect the seed companies monopolies

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Corporate Rights Vs Farmers Rights

The State is under siege. New Intellectual Property Rights (IPR) legislation is being introduced in the area of plant genetic resources (PGR) under pressure of the U.S. government as well as the requirements of the TRIPS agreement of the W.T.O. while W.T.O. gives a five year transition period to introduce PGR legislation, the U.S. pressure was to introduce such legislation immediately.

Further, the U.S. has been demanding monopoly protection for Transnational Corporations (TNCs) which control the seed industry. On the other hand people's organisations are fighting to protect farmers' rights to their biodiversity and their right to survival as well as the freedom of scientists to work for the removal of hunger rather than corporate profits. Farmers organizations, biodiversity conservation groups, sustainable agriculture networks and public interest oriented scientists are trying to ensure that farmers' rights are protected, and through the protection of farmers' rights, sovereign control over our biological wealth and its sustainable use in agricultural production is ensured.

The conflict over PGR legislation is a conflict between farmers and the seed industry and between the public domain and private profits, between an agriculture that produces and reproduces diversity and one that consumes diversity and produces uniformity.

Con - Capitalism – Monopolies Link & Impact

Monopolies create the mechanism for exploitation that kills biodiversity, culture, and political choice

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In other words, what the U.S. government is coercing the Indian government to do is introduce unhealthy fat and meat rich diets through the expansion of U.S. agribusiness, agroprocessing and fast food industry. The proposal is to replace the small peasant and farmer based agricultural economy of India with agribusiness controlled industrial agriculture. This shift is associated a transformation of farmers as breeders and reproducers of their own seed supply to farmers as consumers of propriety seed from the seed industry. It is also a shift from a food economy based on million of farmers as autonomous producers to food system controlled by a handful of TNCs which control both inputs and output. This is a recipe for food insecurity, biodiversity erosion and uprooting of farmers from the land.

It is often stated that IPRs will not stop traditional farmers using native seeds. However, the Seed Act 2004 is designed to do just that. Further when it is recognised that IPRs are an essential part of a package of agribusiness controlled agriculture in which farmers no longer grow native seeds but seeds supplied by the TNC seed industry, IPRs become a means of monopoly that wipe out farmers rights to save and exchange seed. This leads to TNC totalitarianism in agriculture. TNCs will decide what is grown by farmers, what they use as inputs, and when they sell their produce, to whom and at what price. They will also decide what is eaten by consumers, at what price, with what content and how much information is made available to them about the nature of food commodities.

IPRs are a significant instrument for the establishment of this TNC totalitarianism. The protection of the rights of citizens as producers and consumers needs the forging of new concepts and categories, new instruments and mechanism to counter and limit the monopoly power of TNCs in agriculture. Community rights are an important balancing concept for protecting the public interest in the context of IPR protection for corporations.

In the field of food and agriculture, farmers' rights are the countervailing force to breeders rights and patents on seed and plant material. Farmers' rights in the context of monopoly control of the food system become relevant not just for farming communities, but also consumers. They are necessary not just for the survival of the people but also for the survival of the country. Without sovereign rights of farming communities to their seed and plant genetic resources, there can be no sovereignty of the country.

Farmers' rights are an ecological, economic, cultural and political imperative. Without community rights, agricultural communities cannot protect agricultural biodiversity. This biodiversity is necessary not just for the ecological insurance of agriculture. Rights to agricultural biodiversity is also an economic imperative because without it our farmers and our country will loose their freedom and options for survival. Since biodiversity and cultural diversity are intimately linked, conservation of agricultural biodiversity is a cultural imperative also. Finally, without farmers' rights, there is no political mechanism to limit monopolies in agriculture and inevitable consequence of displacement, hunger and famine that will follow total monopoly control over food production and consumption through the monopoly ownership over seed, the first link in the food chain.

Con - Capitalism/Monopolies Impact

Monopolies in the seed industry have trapped farmers in a cycle of debt, destroy biodiversity, and is a form of genocide

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High costs of cultivation, and low returns have trapped Indian peasants in a debt trap, from which they are escaping by taking their lives. More than 40,000 farmers suicides have taken place over the past decade in India.

However, these are not suicides – this is homicide, it is genocide. More than 90% of farmers who died in Andhra Pradesh and Vidharbha in the 2005 cotton season had planted Bt. Cotton. Genetic Engineering is killing Indian farmers. Yet biotech lobbyists like Graham Brookes and Peter Barfoot manipulate data to cover up this genocide. In a recent visit to India Brookes claimed Indian farmers had gained by Rs. 5 billion by having cost saving of Rs. 2000 per hectare. In reality, farmers had an additional burden of Rs. 2250 per acre or Rs. 7625 per acre. This implies losses of over Rs. 10 billion. This is why the governments of Andhra Pradesh and Gujarat have taken Monsanto to court. Seed supply monopolized by global corporations is a recipe for destroying biodiversity and farmers. Only four crops corn, soya, canola, cotton account for most GMO crops planted. Only two traits have been commercialized on a large scale – herbicide resistant crops and Bt. Cotton crops. Only one company – Monsanto accounts for more than 90% GM seeds sold. The Brookes and Barfoot study is not based on primary empirical data but extrapolations from false assumptions and manipulated studies. For the U.S, the lobbyists claim $66.59 per ha of additional benefits for Herbicide Resistant Cotton. Yet 90 Texas cotton farmers have sued Monsanto claiming they suffered widespread crop losses because Monsanto failed to warn of a defect in its genetically engineered cotton. The lawsuit seeks an injunction against what it calls a "longstanding campaign of deception" (The Hindu Business Line, February 26, 2006, p.4 "Cotton Farmers Sue Monsanto")

Con - Capitalism Link

The Green Revolution set in motion a series of events that allowed the GMO's to be introduced without a full understanding of their impacts. The seed companies have used this to help continue their exploitation of the farmer by saying the only way to solve the new problems is with new Genetic Engineering, however this is only a guise to benefit the companies

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Genetically modified crops have been introduced to Indian seed industry without understanding and assimilating the inherent adverse impacts of such crops at a time when the science of genetic modification of plants is in its infancy and lot of genuine research needs to be undertaken before it is deemed fit for commercialisation.

The sixties revolution of cultivating monocrops of hybrids / HYVs has caused tremendous loss to our genetic diversity. This revolution has not only increased the dependence on chemicals in agriculture but also increased the risks to farmers in the form of vulnerability to diseases and pests' attacks. Today the stage has been reached where the looming prices coupled with unreliable quality of agri-chemicals is threatening the very process of agriculture. The cost of cultivation of different crops has gone far beyond the average farmers' affordability. To add to this, genetic engineering in crops is being put forward as the solution to farmers.

Genetic engineering (GE) revolution in the seeds and crops is not the solution to farmers, instead it is a revolution to deteriorate the farmers and robe them economically, socially and ecologically. The present chapter puts in place the economic, socio-ecological, and legal aspects of the genetic revolution in seeds and crops in India. Also shows how the corporate empire is trying to commercialise the technology before it is obsolete and meet the same fate as the green revolution technology. The genetic technological revolution is not for the farmers to benefit but for the corporate to reap the profits.

Con - Capitalism Link

GM companies in the US exploit lesser developed countries

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For example, the large scale planting of GM foods so far have taken place mainly outside the Europe, in countries such as US and Canada, Argentina and Australia, where they have been approved for commercial growth and sale. These crops are then sold to enter on to the international food market, where grain merchants like ADM and Cargill, buy up the grain, ship it and distribute it through out the world. Much of these grains then enter into processed foods; often the same corporations are the processors, who also own the lesser ingredients like thickening agents and emulsifying agents, which again may be produced by genetic engineering.

Globalisation, if it has to become truly people-oriented, has to make universal laws that protect people's health from corporations, rather than making universal laws that protect corporate profits and control at the cost of people's health and livelihood.

A third conflict is the North-South dimension. The Northern countries are set to explore Southern countries for genetic resources. Several countries rich in biodiversity have been exploited by the Northern corporations. However, governments the world over, including Southern governments are not opposing this as they are viewing the technology as the force that can drive their economies forward and give them the cutting edge in the competitive world market. This mindset seems to ignore the fact that neither is the technology controlled by governments, nor the market in which they need to be competitive. Both of these are controlled by the corporations.

Fourthly, the debate on genetic engineering raises questions related to the role of science for public good. One industry representative recently wrote that, in the age of biotechnology and intellectual property "the time honored and noble concept of international public goods is essentially obsolete." Dr. Pusztai's experience clearly shows that when governance does not honour its commitment to the people, public interest suffers. Decisions that should be made in the public institutions for promoting public good are made in corporate offices for promoting corporate interests.

Con - Capitalism – Corporate Link & Impact

The Green Revolution created a shift to a more centralized form of farming control. This has allowed the seed companies to control the market and hijack the environment, human health, animal health and food security

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The Green Revolution did engender a form of food security; however, this form of food security, which was driven by centralised control over agriculture, its resources, its technology, credit and food distribution, was not based on ecological security and livelihood security. As governments and people wake up to the devastation caused by the Green Revolution and the centralized control system exemplified by it, corporate control over food production and distribution systems is being pushed as the means of ensuring food security. Liberalisation has allowed the entry of multinational corporations into the sectors of food production and distribution.

Seed companies like Monsanto and Novartis, through mergers, acquisitions and IPRs, are acquiring global rights to seed; the same seed companies are pushing new ecologically perilous GE technologies that could have an equally risky impact on human, animal and plant health. Global trading giants such as Cargill are taking over the food distribution systems of country after country, and placing the food security of the ordinary citizen on international markets.

The food security system, put in place during the Green Revolution, were centralised systems, like the Food Corporation of India (FCI), the Agriculture Price Commission of India and the Public Distribution System (PDS). The PDS during the green revolution was an instrument to subsidise the food that was being produced at high costs through green revolution technology to reach the consumers at lower price. This was a capital intensive subsidised and centralized system which failed in its attempt to serve the most neediest and starving people. This later led to its diminishing role and dismantled with the beginning of liberalisation and globalisation process in the country. The multinationals are seen as the viable alternative thus creating corporate monopolies, which were earlier state monopolies.

Nowadays the threat of GM seeds is looming over the Indian horizon. India's total imports of seeds in 1998-99 were 244 tonnes valued at $9.8 million. The total exports were 4,900 tonnes, worth $15.4 million, marginally up from 4,700 tonnes in 1997-98 worth $14.6 million tonnes (R. P.Singh et al, Research Paper CIMMYT).

The hijacking of the food system by the MNCs will lead to the complete control over seeds and fertilisers and would provide farmers with credit extension services and marketing support. This would be a sort of bonded farming, as the MNCs would later on dictate their terms and conditions, which would be market driven. Little concern in terms of the welfare of the farmers, the ecology of the area and natural resource management would be taken into account.

Con - Bio-Piracy – Link

Bio-piracy is the patenting of life forms & nature – It is a form of intellectual theft and leads to resource theft

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In a very narrow sense, biopiracy is the phrase some of us, in the social movement, have evolved to refer to the patenting of life forms. I would call it "*the piracy from the past*", from centuries of traditional knowledge, cumulative and collective innovation. This piracy from the past creates a false claim to novelty and invention even though knowledge has evolved since ancient times in third world countries. It is thus intellectual theft. It also leads to resource theft because basically a patent is an exclusive right to exclude others from the use, development and production of patented products and processes. Once a patent is taken on traditional knowledge that exists, it has within it the mechanism to exclude the very communities that generated the knowledge through cumulative and collective innovation and to dispossess them of their rights. That's why in fact these patents are being taken.

I would actually like to enlarge this concept of biopiracy to the piracy from nature because a patent on life claims to create what nature is actually creating. More often these patents are based on discovery and not on invention. By its very nature a patent on life is not an invention because life cannot be invented. It can be manipulated, damaged, mutilated but not invented. Moreover, evolution is the process of millions of years of all living organisms, changing, self-organising, mutating internally and giving us the diversity of life forms we have on this planet. It is in the nature of living organisms to do two things that non-living cannot do: to multiply and to reproduce.

Con - Bio-Piracy – Terminator Gene Link & Impact

Genetically engineering the terminator gene into seeds is a form of bio-piracy – Kills society, culture and democratic choice – makes farmers servants to seed companies

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Patents covering genetically engineered seeds in order for them to become sterile so that farmers could never grow out another crop from these seeds. As a result, the corporations would gain an enlarged market by forcing farmers to come to the market place each year. This is what I call the "*piracy from the future*". This piracy from the future is not just in the deliberate design of sterile seeds. It is also in the deliberate denial of farmers' societies, cultures and the denial of the capacity of citizens to be able to opt for what kind of crops they will grow and what kind of food they will eat.

Across the world, where people have had the free choice and the appropriate information, there has been a global rejection of genetically engineered seeds and crops. Where people do not receive this information –for instance, in the US where there is no labelling law –nobody knows which food is genetically engineered, which is not, and then these engineered crops and seeds have spread.

To sum it up: citizens' rights on environmental and health safety end up being defined not as fundamental rights guaranteed under democratic constitutions but as interference within free trade.

Terminator seeds destroy biodiversity, are a threat to freedom and sovereignty and threatens food freedom of all people

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With the attempt to introduce Terminator Technology, the vulnerability of our farmers and the threat to biodiversity will increase. When the "Working Group on Article 8(j)" of the Convention on Biological Diversity met in Granada in January, the United States Government falsely claimed that Terminator, which creates sterility, would "increase productivity". Indigenous people view the Terminator a threat to their freedom and sovereignty. As Mariana Marcos Tarine of Brazil stated on behalf of the International Indigenous Forum on Biodiversity "Terminator poses a threat to our welfare and food sovereignty and constitutes a violation of our human right to self determination".

And it is not just the freedom of indigenous people to save seed and protect their biological diversity and cultural diversity that is at stake. The ruling of the WTO-GMO dispute threatens the seed and food freedom of all people. When the dispute was initiated by President Bush, in 2003 we started a world wide campaigns. At the WTO Ministerial Jose Bove and Dr Vandana Shiva handed over 60 million signatures to WTO declaring that freedom from GMO's was intrinsic to our fundamental freedoms as people to choose the crops we grow and the foods we eat. We will not be enslaved by the gene giants. We will not allow their homicidal seeds to kill our farmers and our freedoms. We will continue to save our seeds as a duty to creation and our communities. We will spread GMO free zones as zones of our biodiversity and food freedom. We will spread seeds of life and stop the spread of seeds of death.

Con - Bio-Piracy – Questioning GMO's Solves

Fighting bio-piracy is an ethical democratic movement that is the only way to challenge corporate exploitation

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For us, fighting biopiracy is fighting for intrinsic worth of all life forms and therefore it is an ethical movement. Fighting biopiracy is for us the most important anti-poverty movement in the world because two-third of humanity lives on biodiversity. Outside of the industrial system, you either have a forceful economy or you have a biodiversity economy. The majority would live in a biodiversity economy. The denial of our rights to our own biodiversity means increasing poverty. The forced payment of royalties means more outflows. A rough calculation shows that patents on seeds would mean a trillion dollars of payments by the South that produced the genetic diversity of crops to the North and Northern companies would literally steal that genetic diversity.

It is also a sustainability movement because if biodiversity is being locked into patents, there will be less of biodiversity, more manipulation of it and more contamination. The defence of biodiversity and the defence of sustainable use of biodiversity require that we create alternatives to the monopoly system linked to patents. The way we are doing it is to defend the biodiversity and the intellectual heritage that goes with it as a commons, as a public good. That's what our involvement in democracy movements aims to do.

Con - Bio-Piracy – Questioning GMO's Solves

Questioning Bio-piracy has led to movements around the world that has spurred legal activism to challenge corporate exploitation

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Our basic argument has been the following: the ideas of a patent on life and of intellectual property rights are inappropriate to the domain of living systems. This has had a huge impact. It has led to the questioning of the Trade Related Intellectual Rights (TRIPs) in WTO; many governments have taken on these issues and submitted proposals on how the TRIPs should be re-written. The TRIPs review is a mandate under article 27.3 B of the TRIPs agreement. It's also a mandate under article 71.1. It is a part of the Doha round that is constantly under revision, but giant industry ships the TRIPs and does not want a changing of the law. So while we continue to work on review and reform of TRIPs real issues are not negotiated, they are just dictated and whoever is quicker and more clever in manipulating gets the agenda through. So we know that we have to continue to raise those questions at the global level but at the same time we also have to create other means to change that regime. One of these means is legal activism and we have many examples of biopiracy all over the world.