....by any means necessary....

—Malcolm X

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Fuzzy Biological Sabotage

If the left has learned anything from resistance against capital-driven technocracy, it is that the democratic process is only minimally useful for slowing the profit machine of pancapitalism. Since corporations and other capital-saturated institutions own the process, and tend to function outside national democratic imperatives, other methods of power appropriation have to be developed. In the case of biotechnology, the resistance is unfortunately in a position of reactivity. Corporations have already infiltrated most governments and markets at such a furious pace that all that can be done is attempt to slow them down, while cells and organizations regroup and decide on a way to address the many problems that have already arisen, and the many potential accidents that are in front of us. Assuming that inertia is always useful in disturbing capi-

talist production and distribution, one must ask how this principle can be applied to the current molecular invasion. Certainly, traditional tactics have some use, and electronic civil disobedience (ECD) will be of value, although it should be added that this is a time for hard-core ECD (blockage of internal communication systems, blockage of databases, the disruption of routers, etc.) Soft-core tactics like denial of service (DOS) can be of use in disrupting retail services such as assisted reproductive clinics (eugenics clinics by any other name), but most of the biotech industry is not about retail, so DOS is not much use in these cases except as a low-quality theatrical tactic with little pedagogical value.

In the end, however, resistant culture always needs to find a means to fight fire with fire. In other words, how do we develop tactics using biological materials and processes? In response to this question, CAE and some rogue scientists set about trying to form a model of direct biological action. The first unfortunate conclusion that we came to is that civil disobedience (CD) will not work in this situation. While inertia will always disturb a society of speed, it cannot be implemented on the biological front by blocking methods partly because the boundary and territorial models that CD was developed in response to typically have no place in the organic realm. Moreover, since our focus is on trying to intervene in the production of transgenic life-products, almost any action will have some destructive effect. This problem puts resistant agents in a very difficult position. We do not want to make it easy for capitalist spectacle to label resisters as saboteurs, or worse, as eco-terrorists. These terms are used very often and generously by authority and

tend to have the profound effect of producing negative public opinion, which in turn allows state police and corporate posses to react as violently as they desire while still appearing legitimate and just. Escaping these labels completely seems nearly impossible; however, we can at least reduce the intensity and scope of these forms of labeling, and hopefully escape the terrorist label altogether. In any real sense, the association with terrorism is completely unwarranted, since it is not possible to terrorize plants, insects, and single-celled organisms. The problem with GMOs, however, is that they are not open to the kind of destruction that occurs when someone kills a fly or swats a mosquito, because they are more than organisms—they are private property. Since capital values property over all (humans included), one can only expect the strongest types of denunciation and response to its destruction.

In addition, there is already a very reactive history in regard to transgenic crops that can be of symbolic use to authorities. Test sites for new product lines of GMOs in the US, France, and India have been burned. This was and is flagrant sabotage. The location attacked was right. Test sites are a key location to disrupt, because if the studies being done at the sites are corrupted, they have to be redone, thus causing a very costly type of inertia in the developmental system. However, tactical arson plays right into the hands of the authorities. Such action gives them the examples of hard-core sabotage that they need to label, harass, and arrest potential transgressors, as well as individuals and groups opposed to sabotage who have little more than a modest philosophical association with violent resisters.

One interesting element does emerge from the Indian burnings. The group responsible paid the farmer hosting the test site for the crop before burning it. The message here is clear: Do not hurt the farmers/workers physically, psychologically, or financially. Agrarian complicity, in many cases, is nearly a given, because people have no real alternative to the markets dominated by the coercive power of the biotech industry. Grass-roots harassment is an unacceptable tactic that the left has debated and is hopefully pushing aside as the Indian example shows. In the 1980s, some AIDS activists suggested that pharmaceutical salespeople should be harassed as a means of disrupting distribution and thereby leveraging a price reduction of the astronomically expensive medicines needed to combat HIV. This was a terrible idea then, and it is a terrible idea now. From the corporate perspective, workers are expendable and there is a large enough reserve labor army to fill the ranks, so this would have no effect other than making a working family miserable.

CAE believes that the best response to these ultimately unsolvable problems is the idea of fuzzy biological sabotage (FBS). The fuzzy saboteur situates he/rself in the in-between—in the areas that have not yet been fully regulated. This situational strategy was very well developed by Brian Springer in his backhaul video work and in his laser information conduit interventions. His idea was to take what was considered private property, but functionally was public property. A backhaul (off-air live satellite video feeds) was considered the property of the media, but since it was in the public domain of the reception of airwaves and existed without copyright, it could be copied, replicated, and even marketed (now

backhauls are scrambled to stop this process). Springer was brilliant at finding these little cracks in the system and exploiting them. The fuzzy saboteur has to stand on that ambiguous line between the legal and the illegal (both criminally and civilly). From that point, the individual or group can set in motion a chain of events that will yield the desired final result. The opening activity—the only one to which the saboteur should have any direct causal link—should be as legal as possible and hopefully within the rights of any individual. The more links in the chain, the better from a legal standpoint, but extending causal chains increases the difficulty of controlling all the exponentially growing number of variables that could doom the action. For the most part, such actions will only have two phases—the legitimate or fuzzy act and the upheaval it causes. The authorities then have the legal conundrum of proving guilt by indirect action—an unenviable task for any attorney. Moreover, unlike CD, fuzzy sabotage does not require a physical confrontation with authority, and in many cases does not require any type of trespass.

If an action is done correctly, the fuzzy saboteur has an additional safety net supplied by the various governments of the world—plausible deniability. For centuries state forces have sabotaged one another by various means that cannot be proven within any judicial system other than by military field justice. Simply by creating a nonaggressive scenario, or denying activity all together, agencies of discord have avoided direct charges. This symbolic shield can be reverse-engineered to serve resistant culture. With any luck, the fuzzy saboteur will never have to use this shield, but if this is necessary it can create

a platform for public attention where "tactical embarrassment" (to use the RTMark term) can be employed. It may be nostalgically reminiscent of 19th-century anarchism, when it was incumbent upon any member of the movement who was arrested to use the court or any other public stage to denounce the bourgeois system, but practically speaking, and for the health of the tactic, such public displays should be avoided at all costs. A single publicity battle can potentially be won through deniability and campaigning; however, a series of these occurrences will dilute the plausibility of the denial and allow the development of spectacular countertactics by the authorities. Like hard-core ECD, FBS is not a public process. CAE requests that those groups and individuals whose goal it is to spectacularize hacking and perform as activist pop stars to do the movement(s) a favor and leave this method alone—particularly in its testing stage.

The final question then is, who are the agents of FBS? CAE suggests the use of wildlife to do the deed. Microorganisms, plants, insects, reptiles, mammals, tactical GMOs, and organic chemical compounds can all be a part of the resistance. The use of living nonpathogenic biological agents as disrupters will depend on each individual's or group's particular relationship to these creatures, as well as on localized conditions. Obviously, considerable arguments will erupt between the various positions on what constitutes an acceptable relationship between humans and other living creatures, and how various creatures will be employed, but let us say at the outset that we are not proposing that sentient organisms be considered for suicide missions or other incarnations of sacrificial economy.

Pranks

If FBS has roots, it is in the realm of pranks. Most readers probably have a story of a prank that they or someone they knew did involving a biological agent. Placing a dead rodent or fish (nature's stink bombs) in a heating duct at school or some other offending institution is one of the classics. However, these are not among the class of pranks that are of interest to the fuzzy saboteur. FBS pranks are not done for a good laugh, for public embarrassment, or simply to be annoying; rather, they should be done as a form of psychological disturbance—more along the lines of LSD in Castro's cigars and liquid refreshment before a public address (to use an example from the CIA's book of practical jokes). Pranks can be used to stir up internal institutional paranoia, or they can be used to divert attention toward useless activities. Pranks can provide their own unique blend of inertia.

For example, the release of mutant flies in research facilities and neighboring offices can potentially have a disturbing effect. There are all kinds of mutated flies available on the market. They come in various colors with almost any type of deformity one might desire. Labs use them for cross-generational study because they are easy to raise, reproduce quickly, and maintain unusual genetic codes. Choose a set of mutated flies and begin a steady release of them into biotech facilities (it also works well in nuclear facilities). They can be set free in lobbies, parking garages, parked cars, almost anywhere. One does not have to challenge a fortified site—the flies themselves will do the infiltration. If enough flies are acquired or produced, you just have to be near the site and release swarms of

them. Trespassing is not really necessary, unless there is a need for specific targeting. It only takes the occasional observation of them on a regular basis for people to start wondering what might be causing the appearance of these strange creatures. Needless to say, the first conclusion will not be that some fuzzy saboteur must be letting mutated flies go in the offices. The imagination will provide more exotic scenarios. The key here is consistency, not quantity. Moreover, relying on the power of the rumor mill that develops in any workplace, we can be sure that the fear and/or conspiracy factor will be considerably amplified. A paranoid work force is an inefficient work force. This approach thus creates inertia in the system. In the best-case scenario, an investigation into the origins of the flies would be launched, which would burn more cash and waste even more employee time. In the worst-case scenario, the prankster would provide a topic of conversation at breaktime.

If there are other businesses near the research facility, let the flies loose in there too. Restaurants are particularly good locations, since customers are sedentary for a while there, and flies call attention to themselves in environments where food is served. This can have the effect of aiming local business owners' and workers' suspicions at what may be occurring in labs nearby. Needless to say, local tensions could easily increase, and those who never would join a movement could become unknowing cohorts or willing allies.

Pranks such as this one are easy and inexpensive. As for the flies, they really don't care where they are, as long as it's a location that corresponds to their adaptability range. As for environmental danger, this is negligible. Mutant flies have

no adaptive advantage in the wild and their recessive characteristics are not likely to be selected for. They are not overachievers when it comes to survival, so there should be few worries about environmental pollution in any ecological sense. The pollution will be in the human psyche. And isn't it better for a mutant fly to soar free for the resistance than serve a lifetime in laboratory servitude?

For those who would like to have their own mutant fly hatcheries, they are fairly easy and inexpensive to start and maintain. The flies are free, and can be obtained on the web from the Bloomington Fly Center. To maintain the flies you will need fly bottles (they hold about 100 flies); however, if you are on a small budget, you can substitute milk bottles for this function. The fly food is made from molasses, yeast, and apple juice. To get the perfect consistency requires a little human power, but a machine to do this is also available (but they are costly). For optimum breeding an environment with a relatively stable temperature is necessary. The flies should be kept at a temperature between 18-25 Celsius with humidity between 40% and 50%. Flies are fairly robust, but must be kept away from extreme temperatures (especially heat). The life cycle is about one month, so producing a swarm (10,000) is a laborious, assembly-line like task; however, maintaining a small amount over a long period of time is relatively easy.

Test Site Disruption

Over the past forty years, resistant groups have made tremendous strides in terms of organizational principles. Many have

said a happy farewell to central committees, unions, and parties, and replaced them with autonomous cells and temporary, single-issue coalitions with ever-shifting rotational leadership. "The people united will never be defeated" has given way to the more practical idea that tactical unity among resistant political configurations for an immediate and specific purpose can have a systemic impact in spite of differences and contradictions within coalitions. Such immediatism and decentralization has proven to be the best defense against infiltration and cooptation, as well as aiding in the creation, albeit temporary, of powerful popular fronts. Unfortunately, resistant tactics have not always maintained the same level of sophistication and complexity. This is not necessarily the fault of activists since tactical possibilities do not always present themselves as clear and easy. Further, as new contestational situations arise, the reactive tendency of radical subjects pushes them toward immediate action. There is little time to think matters through, because with each passing moment, the object of activists' political offense becomes increasingly entrenched in the system both materially and ideologically. Radical research and development is something of a luxury process, and so the balance between direct action and R&D is one organizational element that remains underdeveloped.

Such is the case with the response to GMOs. There has been a good deal of hard-line direct action, but the tactics are incredibly crude. The use of arson and vandalism by radicals as a means to insert inertia into corporate initiatives is a sign of desperation and a robust imbalance between thinking and acting. Whether one considers the examples of Professor Najundaswamy and his followers in

India, José Bové and his followers in France, and especially the Earth Liberation Front (ELF) in the US, the destruction of assets has been of limited impact, and has functioned primarily as counter-spectacle ripe for recuperation. This is not to say that there are no advantages to such tools. Fire, for example, works on all crops; it is inexpensive to produce, and insures a devastating kill ratio. The problems, however, are also clear. The illegality of direct incendiary sabotage creates a host of difficulties for the perpetrators. As previously stated, this kind of sabotage allows for corporate culture to cry "terrorism," so they can represent themselves as the victims of extreme injustice. In turn, the state and corporate security apparatus grows in strength because sabotage also creates the opening for the successful petitioning by security agencies for increased funds and human resources. Moreover, pancapitalist spectacle can cast guilt through association on all resistant organizations, leading to more segments of the movement coming under direct investigation. This also helps create the public perception that all greens are at least potential eco-terrorist wackos. At the other end of the spectrum, saboteurs can count on long-term incarceration if apprehended. The loss of committed activists to the prison system is not helpful in the long term. A short-term stay in jail for purposes of civil disobedience is fine, since those confined are returned to the ranks rather quickly. Political prisoners as living martyrs do not have a desirable or very useful status as long as other options are available.

If one examines the example of state military sabotage, an optimized set of attack principles is revealed. First, only use the minimum amount of force necessary to accomplish an objective: Mosquitoes should not be killed with a shotgun.

Second, focus the attack on the weakest link in the system. The classic example is the Allies' strategy during World War II of bombing all the German ball bearing factories. These metal spheres were necessary for all vehicles. By focusing on their elimination, vehicle manufacture and field maintenance was brought to a near halt. Another principle that was reinforced during these bombings was the need for accurate and precise targeting systems (a wing of military research and development that has only accelerated in scope and sophistication to this day). Even from the military perspective, deficient as it is in financial logic, carpet-bombing a city to destroy one factory is an unfortunate waste of assets. While activists have done well on the second principle, they have done poorly on the first and third. Burning crops and labs is certainly overkill. Targeting is just as bad. One of the things that greens complain so much about is the potential death of nontarget species due to certain GM products. Fire has the same nontarget effect.

In using the above principles and combining them with fuzzy sabotage, what is the best way to disrupt GMO research? The choice of research sites as a site of resistance is an excellent one. In spite of the fact that corporations generally get a free pass from the EPA and USDA to market their products, as long as they can produce minimal research that demonstrates that a product is "safe," they still must produce *some* research. If they fail to do so, the product line completely stalls. Since this type of research is incredibly protocol-laden in order to achieve accepted standards of scientific rigor, test contamination is very easy. Samples and study replicants are two fragile areas. If either are corrupted, the study has to begin anew, because the research will not generate the statistical power neces-

sary to produce confidence in its validity. For example, when the growth of worms is studied as an indicator of safety in regard to soil toxicity related to *bt* products, all that is necessary is to add more worms of varying weights to the sample. While researchers will probably notice that the sample has been tampered with, they would be unable to clean the sample. The study would have to start again. The facility does not need to be burnt to the ground to place the desired inertia into the system. There is no need to kill nontarget organisms (humans included), nor disrupt or destroy other research initiatives that are not causing any harm that may share a given facility. Such an action is cheap, requires minimal human resources and minimal force, and is specifically targeted.

The lack of organic boundaries in ecological systems allows radical subjects to use corporate culture against itself for purposes of distribution. Canadian organic farmer Percy Schmeiser had his fields corrupted and seed banks contaminated by neighboring Monsanto "Roundup Ready" crops. In Canada, biotech corporations have the right to inspect anybody's crops. After sampling Mr. Schmeiser's canola crop, they discovered this hybridization and slapped the farmer with a lawsuit for patent infringement. Mr. Schmeiser had been growing canola the "traditional" way for 53 years and wanted no part of GM cropping. Unfortunately, not only is he now a part of this system, he is now being used as a example of what will happen to those who refuse corporate crops. You will be attacked one way or the other. As this case has shown, the option for a countersuit is available, but private citizens fighting against capital-saturated corporations in costly court battles do not have significant chances of winning.

The part of this sad story that is of interest to fuzzy saboteurs is that private boundaries are not recognized as sovereign if a nonhuman organic agent crosses them. Have a problem with a test site crop? Go into free-range rat ranching (reasonably low cost), and release as many as possible near the offending site. Moles, gophers, ground hogs, rabbits, mice or any pest not susceptible to given toxins could also be released *en masse* near the test site. After all, laws of private property, trespass, and vandalism do not apply to them. Again, the whole crop does not have to be destroyed; the sample just has to be damaged to the extent that it is no longer representative of the population from which it was taken.

High-Intensity Resistance and Precision Targeting

The question which must now be answered is what to do about the wide variety of potentially dangerous GMOs already fully distributed? In this case, the use of fire or other limited means is totally useless. It simply does not produce the kind of threat that would convince any major corporation to change policy, because it has neither the scope nor the impact on profits (at least not as long as there is corporate insurance and tax write-offs). Offensive mechanisms such as artificial selection are a possibility. For example, feeding *Bt* to a population of pests that is supposed to die from contact with it would eventually yield a subpopulation of pests that are immune to it. This subpopulation could then be bred to create a population that could be released into the wild where it would hopefully spread the resistant gene(s).

While this method would be good only as a long-term strategy, it could eventually have an impact in that it would force corporations to increase the speed (which always costs money) at which they had to respond to shifts in the pest population. At the other end of the spectrum, this type of breeding would not have a destructive impact on the environment, nor increase the pest rate for organic farmers. The downside to this potential strategy is that it is a low-efficiency method, and thereby would probably not be a great enough threat to corporate profits to leverage a change in safety policy and research methods.

The real solution, however, is precision in targeting systems. Any offending organism has its weak link, and it is precisely the same trait that supposedly makes it strong. The gene(s) or biological process that modify the organism can be targeted, and *turned from a trait of adaptability into one of susceptibility*. For example, Roundup Ready (RR)* could fall prey to this strategy. The herbicide Roundup (glyphosate) kills every plant in its path, including unmodified crops.

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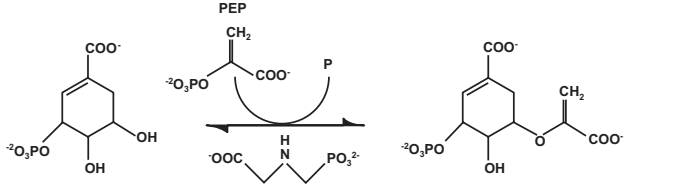
* CAE is not suggesting that RR is necessarily the best target relative to its potential for environmental danger; the example given here just illustrates the point. The preponderance of evidence (although it is not conclusive) does not show any real problems with RR. The primary reason RR could be considered as a target is because it is so common. The creation of an organic substance or creature that could have a devastating affect on RR would get the attention of all food source biotech companies. However, it is just as likely they would use force as a response. In the era of pancapitalism, only the corporations have the right to manage and control the food supply. If anyone else intervenes, it's terrorism. The danger with this roll of the dice is as significant to individuals as the potential dangers from undertested GMOs are to the environment.

Glyphosate works by inhibiting the enzyme 5-enolpyruvylshikimate-3-phosphate synthase (EPSP synthase), which is found in plants and microorganisms but (as far as we know) not in any other life form. EPSP synthase is a necessary enzyme for the organisms that do have it. It is used to synthesize aromatic amino acids, without which the organism cannot survive. In nature, EPSP synthase makes EPSP by bringing shikimate-3-phospate (S3P) and phosphoenol pyruvate (PEP) together. Glyphosate binds the enzyme better than PEP and prevents this reaction from occurring, as shown below.



Shikimate-3-phosphate S3P **Glyphosate** **5-Enolpyruvylshikimate-3-phosphate EPSP**

Thus, Roundup kills by literally starving the plants that it attacks. However, Roundup Ready plants have been genetically modified to produce a version of the enzyme EPSP synthase that protects the plants. This version of EPSP synthase is a natural enzyme found in some bacteria and does not bind glyphosate very well. By genetically modifying the target plant to overproduce the resistant enzyme, the GMO producers insured that the RR plants are immune to the effects of glyphosate. Using pro-drug theory as a model, it

may be possible to produce a biochemical intervention that could either specifically inhibit the resistant EPSP synthase that is present in the GMOs, or one that could set off a cascade of physiological effects that could retard or mutate the plant.

Two compounds already exist that may fulfill this function, both of which were developed or discovered by Monsanto itself. The best option seems to be pyridoxal 5 phosphate (P5P). This compound, when mixed with Roundup and exposed to light, will kill the enzymes that protect the plant. CAE knows it works in the lab, but we have yet to field-test it. Killing an enzyme in a test tube is not the same as killing one in a plant. CAE does not know how well a given RR plant can defend itself against the introduction of the compound (either from protection from the cell walls or from increased manufacture of the enzyme by the plant at a rate faster than the compound can inhibit the enzymes). However, if it works, this compound is simple, safe (it is used in vitamins), and fairly inexpensive when produced in bulk. Because it is such a simple compound, it cannot be patented, so no civil liabilities are associated with it. Instructions for the creation of the photocombustible compound are available from the US medical library. This defense system is available for field testing now, and the real strength of this system is that it will only affect the targeted plants (those using Roundup).

The best civil action that CAE has in development is a model to bond a colorigenic compound (dye) onto the RR enzyme. A colorigenic compound is one that has been synthesized so that it is initially colorless. Upon reaction, the compound is modified and releases a dye. Again, we

would exploit the fact that GMOs carry a specific EPSP synthase that transforms chemical compounds. The trick is to create either a PEP or a S3P look alike that is actually a colorigenic compound that only binds to resistant EPSP synthase, but not to the plant's natural EPSP synthase. Upon binding to the enzyme this compound could then release a dye, thus making all RR crops an undesirable color from the point of view of the consumer.

There are three requirements for this application to be successful: 1) That a colorigenic compound can in fact be created; 2) that the compound has an affinity for the active resistant RR enzyme that is substantially greater than its affinity for the endogenous enzyme; and 3) that the compound and the effects that emerge from its application are harmless to living creatures. The best case scenario is that the compound can be made using FDA-approved food coloring already available and deemed safe for human consumption, as opposed to producing the dye from scratch. If the dye can be developed, it would function as a contestational marker in the fields, and possibly in supermarkets and homes. Home testing kits are a viable possibility. This marker would act as a DIY labeling device that could potentially force a better labeling policy out of the corporations. Finally, it would demonstrate to corporate culture that the future of biotechnology and transgenics in particular will be made a matter of public policy one way or another.

The hope in transforming this potential into reality would be to demonstrate to all corporations that they are vulnerable, and that the public interest must be a part of their testing and distribution procedures. With such leverage, it

is possible that the corporations would begin kill switch and other safety feature research on their own simply to avoid any such potential profit disruptions (it would make great public relations advertising at the very least). One must remember, however, that this plan is not a quick fix; development could take years, but it can be done. Precise targeting is very difficult to do. Much like advanced electronic hacking, genetic hacking and reverse engineering are very specialized tactics. This is why corporations do not at present fear reverse engineering. The GMO revolution has been bloodless, because resistance does not have the capital to mount a counter-offensive on the molecular level. Much like fighting nomadic (virtual) power with nomadic tactics, the current molecular invasion has to be confronted in the molecular theater of operations. For the resistance to progress on any credible, effective level, rebel labs and rogue human resources in molecular biology have to be developed.

With the combination of traditional, electronic, and biological means of resistance, hopefully enough inertia can be introduced into the biotech industries that there will be time to do long-term, replicated studies that will sort out the useful products from the pollutants for profits. We can only hope that the processes and products that pose a threat to the environment will eventually go the way of DDT, but now what is needed is time in order to produce the cautious attitude and the rigorous science necessary to introduce GMOs into fragile ecosystems.