Bio Terror Bible

EXPOSING THE COMING BIO-TERROR PANDEMIC

BIOTERRORBIBLE.COM: Genetically engineered bio-weapons are a reality and may be coming to a theater of war sometime soon. Although some would argue that genetically modified food itself is a bio-weapon, these particular weapons are essentially bio-terror agents which have been genetically modified to cause the most amount of damage possible.

Title: Tinkering With The Genes Of Biological Weapons: Genetic Engineering Is Regularly Used To Produce Lethal Bacteria
Date: July 13, 2000
Source: Sunshine Project

Abstract: Investigations by the Sunshine Project show that genetic engineering has been used in the past decade to tinker with the genes of biological weapon agents. Researchers in the USA, UK, Russia, Germany and other countries introduced genes into hazardous bacteria that are likely to enhance the biowarfare possibilities of these microbes. Strains have been designed that can withstand antibiotics, are undetectable by traditional equipment, can overcome vaccines, or that cause unusual symptoms, thereby hampering diagnosis. In general, gene transfer can be used to build more effective biological weapons, it could be used to broaden the military biological warfare spectrum, making it more difficult to fight and control bioweapons.

"*Military research seems to be out of control*", says Jan van Aken, genetic engineering expert of the Sunshine Project. "*Many research projects have a clear offensive potential. To just stick the label 'defense' on it is not enough. We urgently have to draw clear lines and prohibit genetic engineering with biological weapon agents.*"

At the same time, it is very unclear that efforts to strengthen the Biological Weapons Convention will succeed in the round of negotiations currently underway in Geneva. In light of the increasing biowarfare threat, the international community decided in 1994 to negotiate a Protocol to strengthen the Biological and Toxin Weapons Convention (BTWC). (1)

Considering that the biowarfare threat is dramatically increasing due to the speedy development of genetic engineering, a Bioweapons Convention that it not updated to reflect new technological realitites will not create global security. "*In light of recent advancements in genetic engineering, updating and reinforcement of international law that outlaws bioweapons is urgently needed.*" says Edward Hammond of the Sunshine Project's Seattle office. A strong Protocol will be a first step, that enhances tranparency, making it more difficult for countries to conceal a bioweapons program, for example, in the guise of pharmaceutical research.

Genetic Engineering: A New Class Of Biological Weapons
It sounds like science fiction, but it is a deadly reality: lethal microbes, with no cure, invisible to detection systems, and able to overcome vaccines. In 'defensive' programs, researchers in the USA, UK, Russia and Germany have genetically engineered biological weapons agents, building new deadly strains. And this is probably only the tip of the iceberg.

Genetic engineering can be used to broaden the classical bioweapons arsenal. Through genetic engineering, bacteria can not only be made resistant to antibiotics or vaccines, they can also be made even more toxic, harder to detect, or more stable in the environment. By using genetic methods that are standard procedures in thousands of labs worldwide, bioweapons can be made more virulent, easier to handle, and harder to fight. In short, more effective.

Military experts are perfectly aware of the danger of genetically engineered bioweapons, as their traditional defense measures - e.g.detection methods or vaccines - are easily sidestepped by the artificial microbes. The speedy development of genetic engineering is one driving force to strenghten the Bioweapons Convention and establish a verification system.

Example 1: Bacteria Causing Unusual Symptoms
Researchers from Obolensk near Moscow inserted a gene into *Francisella tularensis*, the causative agent of tularemia and a well known biological weapon agent. The gene made the bacteria produce beta-endorphin, an endogenous human drug, which caused changes in the behaviour of mice when infected with the transgenic bacteria. (2) According to the published results, the endorphin gene was not introduced into a fully virulent strain, but only into a vaccine strain.

If inserted into virulent *F. tularensis*, the victims would not show the usual symptoms of tularemia, but instead unusual symptoms that would obscure the diagnosis and delay therapy. Development of symptom-altered BW-agents has been identified as one possible application of genetic engineering for BW purposes by the US Department of Defense. (3)

Example 2: Transferring A Lethal Factor To Harmless Human Gut Bacteria
Genetic engineering could make previously harmless bacteria lethal biological weapons by introducing deadly genes from a highly pathogenic organism. This was done by US researchers as early as 1986. They isolated the gene for the lethal factor of Bacillus anthracis, the causative agent of anthrax, and introduced into Escherichia coli, a normally harmless gut bacteria. The US team reported that the lethal factor protein was active in E. coli and displayed the same deadly effects as it did when in its native B. anthracis. (4)

Example 3: Antibiotic Resistant Anthrax And Tularemia
Antibiotic resistance is often used as a marker gene in genetic engineering experiments. However, the very same genes could render biological weapons more dangerous by making agents less treatable. Any experiment with biological weapons agents using antibiotic resistance genes has a strong offensive potential, even if in the contect of âdefensiveÔ research. Despite this obvious problem, there is a long list of questionable experiments:

German military researchers at the *Santitaetsakademie der Bundeswehr* in Munich, the main BW research facility of the German army, cultured genetically engineered *Francisella tularensis* subsp. *holarctica* bacteria (5), a close relative of the causative agent of tularaemia. An antibiotic resistance marker gene (tetracyclin) was been inserted into these bacteria.

Recently, researchers from Porton Down in the UK used genes conferring resistance to antibiotics for genetic studies in fully virulent strains of anthrax. (6) In the late 1980s, a researcher at the University of Massaschussetts in Amherst also introduced antibiotic resistance genes into anthrax, making it less treatable with antibiotics. (7)

There are even more cases: Researchers from the Institut Pasteur in Paris (8) and from a Russian laboratory in Obolensk (near Moscow) (9) introduced antibiotic resistance genes into anthrax bacteria.

All these studies are allegedly "basic research", where antibiotic resistance is used as a marker gene. But it is obvious that the very same genetically engineered bacteria can be used to design more effective bioweapons compared to the natural anthrax strains.

Example 4: Invisible Anthrax
In December 1997, the same Russian research group from Obolensk published a paper in a British scientific journal on another effort to genetically engineer anthrax. (10) By putting new genes into fully pathogenic strains of anthrax, the scientists altered anthraxÔs immunopathogenic properties, making existing anthrax vaccines ineffective against the new genetically-engineered types.

In most cases, detection of bioweapons relies on molecular recognition of the microbe using antibodies similar to the human immune system. Altering the immunogenicity not only overcomes vaccinations; but also the detection systems.

Western military experts were alarmed by this work. The chief of the bacteriology division at the US Army Medical Research Institute of Infectious Diseases (USAMRIID) in Fort Detrick, Md, Col. Arthur Friedlander, commented: "*This is the first indication we're aware of in which genes are being put into a fully virulent strain. They genetically engineered a strain that's resistant to their own vaccine, and one has to question why that was done*". (11)

The Russian researchers also constructed a new vaccine against the new strain. This is of particular importance, as it could enable an army to use such a bioweapon by vaccinating their soldiers against a specific strain, while the enemy remains vulnerable. The case is an example of the frightening potential of genetic engineering applied to biological weapons research (Sunshine Project, 2000).

Title: A Continental Step Forward For Biosecurity: African Law Criminalizes Genetic Engineering For Hostile Purposes
Date: August 30, 2001
Source: Sunshine Project

Abstract: The legal penalties for using genetic engineering to cause harm are on the rise in Africa. African leaders made the move in July at their Lusaka, Zambia summit, where they endorsed the African Model Law on Biosafety. At the same meeting, the Organization of African Unity (OAU) began its transformation into the African Union (AU).

The new Model Law specifically criminalizes use of genetic engineering for hostile purposes with penalties including incarceration and fines. These apply to persons, organizations, and corporations. If a corporation is responsible, its chief executive officer may be held accountable. In addition, African courts may prohibit anyone convicted of violating the law from conducting future biotechnology research.

The Model Law is designed to implement provisions of the UN's Biosafety Protocol and is a fully-developed legislative "template" that the AU recommends its members adapt and enact into national law. Penalty specifics, such as the size of fines and length of jail sentences, are determined according to national standards by the former OAU's fifty three member countries.

The Sunshine Project and other non-profits have congratulated the African Union on its decision, citing it as exemplary of the robust and comprehensive law needed internationally to avert the hostile use of biotechnology. Africa led the world in the successful negotiation of the Cartagena Biosafety Protocol and is doing so again in criminalizing hostile use of genetic engineering. Because of the immense dangers posed by abuse of biotechnology, AU member states should implement stiff criminal penalties and continue their innovative work to make biosafety laws and biological weapons control mutually supportive.

The criminal sanctions in the Model Law are applicable to persons who create or use GMOs that damage "*human health, biological diversity, the environment, or property*". This means that protection is provided for people, plants, crops, soils, and the natural and built environment, including items such as foodstuffs, vehicles, shelter, buildings, and other property and infrastructure.

The latter items, some not traditionally considered biological weapons targets, have emerged as an area of increased concern. Earlier this year, US military officers called for the Biological and Toxin Weapons Convention to be changed to permit GMO microbes that destroy inanimate property. In recent years, government funded biodefense researchers in at least 4 countries have used genetic engineering to create biological agents that are more pathogenic or difficult to stop. The US has gone a step further: US Navy researchers have developed GMO bacteria that destroy plastics. As a former senior US Marine Corps scientist told US defense researchers last year, "*There is almost nothing that some bug won't eat.*"

Africa's Model Law is proactive and does not only apply after damage is done. It covers multiple phases of biological weapons research and use by prohibiting "*development, acquisition, application, or deliberate release*" of a GMO – or a product thereof - with the intention of causing harm. Coupled

with the import regulations of the Model Law, enacting the provisions on hostile use will also give African countries an important tool to detect, prevent, and punish the entry of biological weapons.

In the area of genetic engineering, the African Model Law echoes the broader prohibitions of the Biological and Toxin Weapons Convention, which covers not only genetically modified biological weapons; but development of all biological agents and toxins for hostile purposes. More than 140 countries are parties to the BTWC and many have enacted national implementing legislation that laws such as the Model Law complement. The Cartagena Biosafety Protocol was adopted in January 2000 and opened for signing in May of last year (Sunshine Project, 2001).

Title: US Special Forces Seek Genetically Engineered Bioweapons
Date: August 12, 2002
Source: Sunshine Project

Abstract: The US Special Forces have issued a brief but explicit request for US scientists to make proposals to create genetically engineered offensive biological weapons. This is the fourth US government proposal for anti-material biological weapons uncovered by the Sunshine Project this year. All biological weapons are prohibited by the Biological and Toxin Weapons Convention (BTWC), which the United States is legally obliged to obey.

Despite last year's anthrax attacks and US pledges of robust retaliation against bioweapons violators, in 2002, the US Special Forces asked US scientists to create bioweapons for use in covert military operations. Like all bioweapons these violate the BTWC, and because the Special Forces are requesting US scientists to make them, the elite military group is flirting dangerously with the Biological Weapons Anti-Terrorism Act, a US law that makes solicitation of bioweaponeering a criminal act.

The Special Forces Request
The US Special Forces' solicitation came in January 2002 as part of "Scientists Helping America", a cooperative effort between the Special Forces, the Defense Advanced Research Projects Agency (DARPA), and the US Naval Research Laboratory (NRL). Playing heavily on the US reaction to the September 11th attacks, "Scientists Helping America" asked researchers to show their patriotism by turning their talents to weapons, including bioweapons, specifically, genetically engineered bugs that eat materials and stealthy modified organisms (called "taggants") that can be used to invisibly "paint" a target so that it can be destroyed with other weapons later.

The Special Forces desire was initially identified in a short May 1999 document by its Future Technology Working Group. The document identifies the military appeal of "*a bio-engineered organism* [that] *can become a weapon by acting as a corrosive agent after a certain period of time or by a remote command*". The same document sets out the uses of a "*bio-organism that can be placed on a building and then grow across that building to act as an illuminator for target identification, or precision attacks*" (taggants). The document indicates that these bioweapons would be used covertly, stipulating that they "*should be innocuous in appearance so that they can be carried and placed by Special Operations Forces without detection.*"

Following the May 1999 paper, the March 2001 report Special Operations Technology Objectives provided an overview of the wide range of military technologies required by the Special Forces. This report includes descriptions of many military technologies and reiterates the request for genetically modified anti-material bioweapons and taggant bioweapons. In January 2002, as part of "Scientists Helping America", the Special Forces posted the March 2001 report on the internet and requested US scientists to forward proposals to DARPA. In early 2002 DARPA vetted the ideas and invited the authors of promising proposals to come to Washington and present them to military officials. On 25 January 2002, the Sunshine Project requested these proposals from DARPA under the Freedom of Information Act. DARPA has not responded to the request.

Undermining Biosafety
Preventing genetically engineered disasters is a common concern of arms control and biosafety. The Special Forces propose to covertly introduce difficult to detect genetically modified organisms (GMOs)

into third countries. The nascent international safety system for transboundary movement of GMOs (the Cartagena Biosafety Protocol) creates the fundamental requirement of consent. That is, deliberate introduction of GMOs into the environment must have the advanced informed agreement of a competent government agency in the receiving country which reviews the safety and desirability each new introduction on its soil. The Special Forces obviously will not seek permission from a country they are attacking. Moreover, the Special Forces have virtually no knowledge or ability to predict the ecological impacts of use of such environment modifying weapons. As such, the proposed weapons not only pose arms control problems; but are a direct affront to international biosafety efforts.

More US Bioweapons Proposals
The Special Forces are not the only US government agency playing with biological fire - several US Department of Defense agencies are failing to obey the Biological and Toxin Weapons Convention (BTWC). The Special Forces join the Naval Research Laboratory (Washington, DC), Brooks Air Force Base (San Antonio, TX), and the US Department of Energy's Idaho National Engineering Laboratory as proponents of US bioweapons production. In addition, the Joint Non-Lethal Weapons Directorate (JNLWD), run by the US Marine Corps, has requested the US National Academies of Science to assess proposals for anti-material biological weapons. Other JNLWD documents describe "calmative" drug weapons for crowd control that would also violate biological and chemical weapons law. The Sunshine Project has submitted these documents to the US Department of Justice and requested an investigation. To date, there has been no response. (See the Sunshine Project website, www.sunshine-project.org, for more information on the other cases.)

About Anti-Material Bioweapons
Anti-material bioweapons are those that degrade or destroy military materials or infrastructure, such as plastics, rubber, or petroleum products. Generally, they are microorganisms genetically modified to enhance digestion of targeted materials. For more information on anti-material bioweapons, please refer to reports on the Sunshine Project website.

About Taggant Bioweapons
Taggant bioweapons have been discussed as a theoretical possibility for a number of years; but (to the Sunshine Project's knowledge) never actually developed. The concept is simple, although there are many possible variations. In essence, a microorganism modified to exhibit an unusual behavior (for example, "glowing" genes, although in practice the trait would be far less detectable). A building, vehicle, or other object to be tracked and/or identified is then (secretly) inoculated with the bioweapon. The organism, which may or may not be deliberately destructive, is allowed to grow undetected. Because the organism exhibits an unusual trait, it can (theoretically) be detected by remote means, even if the object moves or is small and/or difficult to identify from a distance. The object's precise location can thereby be secretly tracked, facilitating surveillance and/or the targeting of a weapon to destroy it. In the Special Forces conception, these taggant weapons might also be engineered to be destructive upon command, for example, by triggering an inducible promoter system (popularly known as "terminator technology") that stimulates production of a corrosive agent (Sunshine Project, 2002).

Title: Ricin Breeding And Production Projects At Texas Tech University Raise Questions
Date: October 23, 2003
Source: Sunshine Project

Abstract: Since the mid-1990s, researchers at Texas Tech University (TTU) in Lubbock have conducted several projects to produce ricin, a toxin found in the seeds of the castor bean plant. Ricin is deadly in very small quantities and is subject to tight restrictions under both the Chemical and the Biological Weapons Conventions. At TTU, agriculture researchers bred castor to create high-ricin yielding plants specifically adapted for toxin production. TTU chemical engineers also built a machine to extract the highly potent toxin. The peaceful biomedical demand for ricin is extremely limited, and TTU's efforts far outstrip it in many aspects. TTU's public explanation of all its ricin projects is required. The activities are of particular concern because of TTU's quiet but intense involvement in Pentagon biodefense programs.

The Breeding Project
TTU's castor breeding project, which began in 1995, has two aims - producing a variety of castor with

low ricin content, and one with high content. A low ricin variety, called "TTU-LRC", is the one that the University likes to talk about. But the project also aimed to create a castor variety specifically adapted for ricin production, with the characteristics of being machine-harvestable, having high toxin content, and a low level of Ricinus communis agglutinin (RCA). RCA is a product of the seed that is harmful; but that is difficult to separate from ricin. By breeding for lowered RCA and the other characteristics, TTU sought a new variety of castor fine-tuned for manufacturing ricin.

The Ricin Extraction Unit
Parallel to the castor breeding effort, beginning in 1996, TTU's chemical engineering department designed and built a machine to automate the process of extracting purified ricin from seeds grown on the university's 2 acre (.81 hectare) experimental castor plot. According to recent statements by TTU, this machine ran test batches of 'denatured' castor beans that did not contain ricin; but was never used to actually produce toxin. Like the castor breeding, the construction of this machine has been justified by TTU with the explanation that ricin might be used in pharmaceutical products. Yet there are no approved pharmaceutical uses of the toxin. Medical experiments have utilized very small quantities of ricin for years; but no viable products have resulted. And biomedical researchers are able to produce the tiny quantities of ricin that they need on-site - without a castor field, without a ricin 'extraction unit', and without any need to produce, store, and ship large quantities of toxin.

Scale & Purpose
In many countries, castor is grown for its oil, which has many uses. In commercial castor production, ricin is a dangerous nuisance, and it is systematically eliminated from the oil and byproducts. TTU efforts work in the opposite direction - they relate to producing the toxin at a scale for which there is absolutely no legitimate use. A small plot of many existing types of castor will produce many times more toxin than is needed for legitimate biomedical purposes. With TTU's ricin extraction technology, even its small test plot is capable of producing enormous amounts of toxin. With normal harvests and farming practices, TTU's two acre (.81 hectare) plot, sown with an average ricin-level variety, can yield in excess of 150 kilograms of toxin if it is efficiently extracted. By way of comparison, the international terrorism scare prompted by last year's discovery of ricin in Europe was provoked by a few grams of the substance.

GMOs with Ricin
TTU scientists also developed ways to move the genetic code for ricin from the castor bean into other plants, such as cotton. Comparatively little is publicly available about this research although a notice on TTU's website indicates that TTU has developed transgenic ricin technology that is for sale. According to the notice, ricin production can be limited to parts of the plant that are not typically harvested. In this particular area, TTU's work follows that of others - University of Florida researchers produced ricin in tobacco as early as 1994, and have followed with work to produce ricin in laboratory cell cultures.

Conclusion
The effort at TTU to develop ways to produce and use ricin involved a coordinated effort across several academic departments and activities that, if conducted in many countries, the US would consider proof of a weapons program. While TTU is not the only university to experiment with transgenic ricin, the creation, much less release, of genetically-modified ricin-producing species is an extraordinarily bad idea. Either through accidents or abuse, such plants could result in widespread problems from ricin toxin. TTU's work to breed a ricin production variety of castor is completely unwarranted. Selection for ricin production characteristics should never have been performed, and the germplasm should not be released. TTU's construction of a ricin extraction unit in the absence of any legitimate demand for the weapons agent product was sheer folly.

Because TTU ricin activities relate to production of a toxin subject to severe restrictions under the Chemical and Biological Weapons Conventions, TTU should provide a detailed public explanation of all of its ricin projects. Ricin production has little to no reasonable peaceful application, but it could be appropriated for military purposes. So, TTU should wish to avoid suspicion by clarifying that its ricin production projects have no relationship to any Army, Air Force, or other Pentagon biodefense research that is being conducted at the University. TTU's explanation should account for all the castor and any toxin that TTU has produced and fully describe the present status of all TTU ricin-related projects, including any at its Health Science Center or other affiliated environmental and health

institutions. It should fully explain TTU's motives in the ricin work and every application to which the knowledge, plants, equipment, and toxin that it has produced have been applied (Sunshine Project, 2003).