Chapter 3

The Community

Anthrax Opposition Grows

John Bonifaz

This is reprinted from Peacework, May 1989, p.12.

The campaign to stop Army-funded anthrax research at UMass/Amherst continues to gain support throughout Western Massachusetts and elsewhere. The AFSC of Western Mass. which launched this campaign in January, (see April *Peacework*), has submitted an article for the Amherst Town Meeting in May which would make Amherst the first "biological warfare research-free zone" in the country. If adopted, the article would serve as a strong message of opposition to the Army's germ warfare program and would encourage others to fight against similar Army research projects in their communities.

For the past eight years, the US Army has been funding research on the anthrax bacterium at UMass/Amherst. The project is part of the Army's Biological Defense Research Program (BDRP), a program that AFSC says undermines the 1972 Biological Weapons Convention signed by the US and more than 100 other nations. That treaty prohibits the testing, production, and deployment of biological agents for warfare purposes.

"We cannot afford to ignore the grave threat the Army's germ warfare program poses to the people of the world," says AFSC's Frances Crowe. "This program threatens to start a whole new arms race, unleashing hundreds of deadly germ warfare agents."

Since 1980, the Army's BDRP has increased from virtually zero dollars funding to some $61 million today. Within the past three years, that increase has been at its greatest with a jump of 800 percent in funding--the largest exponential growth of any military program under the Reagan administration.

Today the Army is funding projects at more than 125 universities and research institutions, focusing on nearly every known germ warfare agent. AFSC says that the scale of this program, at the very least, leads other nations to perceive it as offensive and, thereby, undermines the 1972 treaty.

In addition to declaring Amherst a "biological warfare research-free zone", the AFSC town meeting article, if approved, would advise the Town's Board of Health to adopt the regulation banning all germ warfare research from the community.

AFSC's call for an end to the Army project at UMass/Amherst has been endorsed by several local organizations as well Physicians for Social Responsibility, Physicians for Human Rights, the Committee for Responsible Genetics, and the Foundation on Economic Trends. In addition, the SANE/Freeze National Board, at its January meeting, adopted a resolution calling for a halt to the Army's Biological Defense Research Program.

For more information on the campaign, contact AFSC, 3 Langworthy Road, Northampton, MA 01060; 413-584-8975.

--John Bonifaz

Dear Member of the Community

Frances Crowe

April 14, 1989

Dear Member of the Community,

As you may know, the upcoming Amherst Town Meeting will include a discussion of an article on biological warfare research. We have submitted this article for consideration because we believe strongly that research intended to enhance the Pentagon's ability to wage germ warfare poses a grave threat to the people of the world. We are hopeful that Amherst will approve this article and, by doing so, will lead the nation in opposing the Army's germ warfare program.

The purpose of our article is two-fold: 1) to make Amherst a biological warfare research-free zone, and 2) to have the Town Meeting advise the Amherst Board of Health to ban all research from the Town of Amherst which is funded by the Army's Biological Research Defense Program.

In reviewing this matter, we ask that you consider the following facts:

*The Army's Biological Defense Research Program (BDRP) saw the largest exponential growth of any military program during the Reagan administration.

*The Army's BDRP is funding research at more than 125 universities and research institutions across the country, focusing on nearly every known potential germ warfare agent.

*The University of Massachusetts-Amherst, with some $1 million from the Army's BDRP, has been conducting research on the anthrax bacterium for the past eight years.

*The first biological weapons produced by the US were anthrax bombs for possible use in World War II.

*The Army research at UMass, like much of the BDRP research, is aimed at developing an improved vaccine for the protection of US troops. (Source: US Army Final Environmental Impact Statement on the Biological Defense Research Program, April 1989)

*Vaccines play no role in protecting against an attack by biological agents. Because there are so many biological weapons, it is nearly impossible to know which weapon or weapons might be used by an aggressor. And it is impractical to vaccinate US troops against all such potential weapons.

*Vaccines <u>are</u> useful adjuncts to the offensive use of germ warfare. If you know which agent you are planning to use, you can immunize a segment of your armed forces so that they can operate in the enemy area you have contaminated.

*In addition to researching known germ warfare agents, the Army's BDRP is also funding research on what it calls "high hazard" or "genetically engineered organisms." Such research, using the new abilities of biotechnology, involves the potential creation of organisms which do not exist in the natural environment-- organisms which can carry diseases far more deadly than those we currently know. With the method of gene splicing and recombinant DNA, such research can lead to an infinite number of new germ warfare agents.

*In 1972 more than 100 nations, including the US, signed the Biological Weapons Convention prohibiting the testing, production, and deployment of biological warfare agents. At the very least, the Army's Biological Defense Research Program leads other nations to perceive the US as preparing for offensive germ warfare and, thus, threatens to start a whole new arms race. The US should work to strengthen this treaty, not undermine it with germ warfare research.

Our call for an end to germ warfare research has been endorsed by several area organizations as well as the following national organizations: Physicians for Social Responsibility-National Office, Physicians for Human Rights, the Committee for Responsible Genetics, SANE/FREEZE, and the Foundation on Economic Trends.

We urge you to help halt this new arms race before it is too late. We urge you to attend the Amherst Town Meeting and to voice your support for the article on biological warfare research.

Sincerely,

Frances Crowe

Frances Crowe
Western Mass. Community Representative
American Friends Service Committee

COMMENTS ON THE ARMY'S GERM WARFARE PROGRAM

"The data gained from 'defensive' BW (biological warfare) testing is the same information needed to develop offensive capability...The argument that military funds for biomedical research, such as vaccines, are beneficial is fallacious. Increased vaccine research is desperately needed and should be funded by the National Institutes of Health. Military-funded vaccine research has military goals, whether the individual investigators can perceive them or not. Furthermore, a vaccine for truly defensive use would have to be developed secretly, since it would be useless if the adversary knew of its existence. Vaccine development is, in fact, more important for vaccinating troops in advance of an offensive BW attack."

-Jonathan King, "Biology Goes to War," Science for the People, Science Resource Center, Cambridge, January/February 1988, page 19-20. Jonathan King is a professor of molecular biology and director of the Biology Electron Microscope Facility at the Massachusetts Institute of Technology.

"Even Defense Department officials cannot define the distinction between offensive and defensive BW research. Exploiting this ambiguity, the Defense Department has embarked on a provocative program, using new genetic technologies in ways that threaten to destabilize the treaty process and stimulate a new biological arms race."

-Charles Piller, "Lethal Lies About Fatal Diseases," The Nation, October 3, 1988, pg 271. Charles Piller is the author, with Keith R. Yamamoto, of Gene Wars: Military Control Over the New Genetic Technologies.

UNIVERSITY OF MASSACHUSETTS AT AMHERST
Department of Microbiology
203 Morrill Science Center
Amherst, MA 01003
(413) 545-2051

Dear Amherst Town Meeting Member -

We have been following the published accounts of the controversy surrounding Bacillus anthracis research at the University of Massachusetts. We have become quite concerned that the members of the Town Meeting may be misled in their judgement on this matter due to the preponderance of inflammatory and misleading statements made by the American Friends Service Committee and others in the press.

Initially, the AFSC portrayed the research as presenting an imminent health threat to the citizens of Amherst. This approach provoked much unnecessary anguish among the citizens of Amherst, and prompted many fearful letters to the University. There is no health threat to Amherst, nor to the researchers working in the lab, for that matter. The strains of Bacillus anthracis used in this research are incapable of causing disease - the researchers who work with these organisms on a daily basis are not even vaccinated against anthrax. Faced with a preponderance of evidence contrary to their initial claims, even the AFSC has stopped claiming the research presents a direct health threat to the community. They have said, in fact, that they would take no issue with the research were it not funded by the Army. A health threat that disappears when the source of funding changes seems quite impossible to us.

Since the research is funded by the Army, it has been automatically equated with biological warfare. This is unfair and misleading. The work in the lab at the University is not "germ warfare" research, "biological warfare" research, or any other kind of offensive research. It is basic genetic research on an organism capable of causing human disease and aimed at finding an improved vaccine - nothing more. A vaccine is simply not a weapon. The fact that the Army desires an improved vaccine against this disease in no way presupposes (as the AFSC would have you believe) that its purpose must be related to biological warfare at all. The fact is that anthrax is still an endemic disease in many areas of the world. United States forces, as part of their mission, must be prepared to operate anywhere in the world at the request of our government or an ally. In order to assure this capability is

maintained, military personnel are immunized against many diseases which pose no threat to them in the United States. How many cases of smallpox, cholera, or plague are reported yearly in the United States? Immunization against these diseases is routine in the military; no one equates these vaccination programs with biological warfare. An improved vaccine would aid more than the military, however. Peace Corps volunteers, International Red Cross workers, United Nations personnel, and indigenous civilian populations would also benefit.

Research on B. anthracis is not limited to Amherst, this state, or even this country. Rather, this research is part of a truly international effort. There was, for example, an international workshop on anthrax research held in Winchester, England this month. This meeting was attended by over 100 scientists from over 20 countries, including the Soviet Union and the People's Republic of China, whose work involves research on anthrax or Bacillus anthracis. This conference was attended (by unsolicited invitation of the organizing committee) by a member of Dr. Thorne's lab, who presented a talk on the research being conducted here.

The research in Dr. Thorne's lab is published in public journals available to scientists everywhere and has been for the last 23 years. The lab corresponds frequently with researchers around the world working on B. anthracis, exchanging information and scientific techniques. In fact, a Soviet scientist whose research involves B. anthracis will be visiting the lab to work with Dr. Thorne for 20 days in October-November of this year. Discoveries made in the lab at the University are available to all (including the military), and would be whether the Army was funding the research or not - this is a strict and prudent policy of the University.

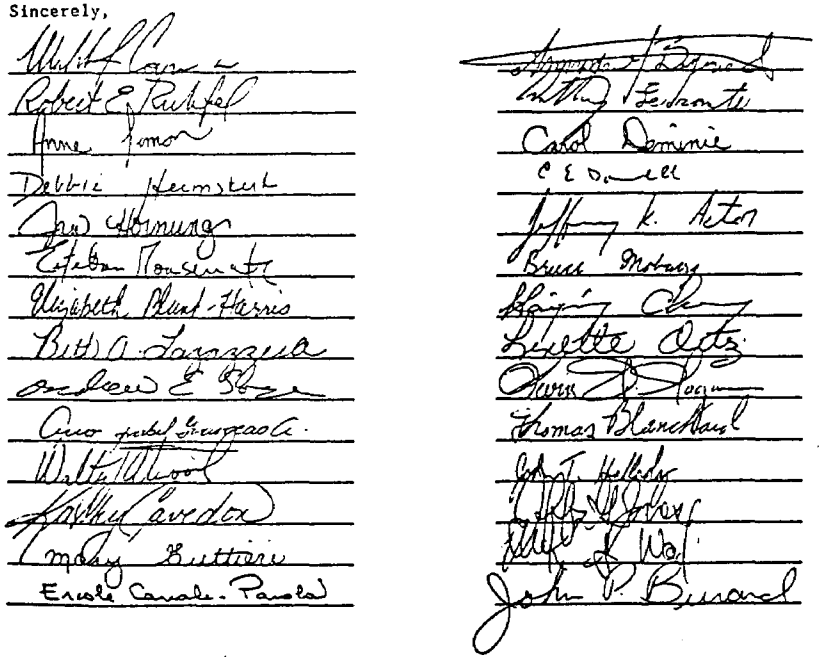
Article 67, a petition by the AFSC to declare Amherst a "biological warfare research-free zone" will soon come before the Town Meeting for deliberation. The language in this article, and the argument it presents, are quite misleading. Paragraph 1 of this petition, for example, states "Whereas the US Army's Biological Defense Research Program presents an offensive threat to other nations...". How was this conclusion reached? The world knows of Dr. Thorne's work, it is not considered a threat or in violation of anything by anyone except the AFSC. The AFSC has alleged that the research being conducted at the University is in violation of the 1972 Biological Weapons Convention. This contention is untrue - in fact, specific articles were purposely included in this treaty to insure that signatories "cooperate in

contributing individually or together"..."to further the development and application of scientific discoveries in the field of bacteriology (biology) for prevention of disease, or other peaceful purposes." We are vehemently against offensive biological research. The fact is, however, that this is not the type of research being carried out by Dr. Thorne's lab, nor has the AFSC shown evidence that offensive biological warfare research is occurring anywhere in the country, let alone in Amherst.

We urge the Town Meeting Members to consider carefully the steps they are being asked to take. Interfering with or hindering academic freedom on the basis of supposition without factual support (the Army is paying for it, therefore it MUST be evil) would set a dangerous and damaging precedent. We feel confident that if presented with facts instead of insinuations the Town Meeting will act swiftly to defeat this threat to Amherst's reputation as an intellectual community supportive of academic pursuits.

NOTE: These signatories are faculty, staff, and students in the Dept. of Microbiology, University of Massachusetts.

Sincerely,



Signatures
Page Two

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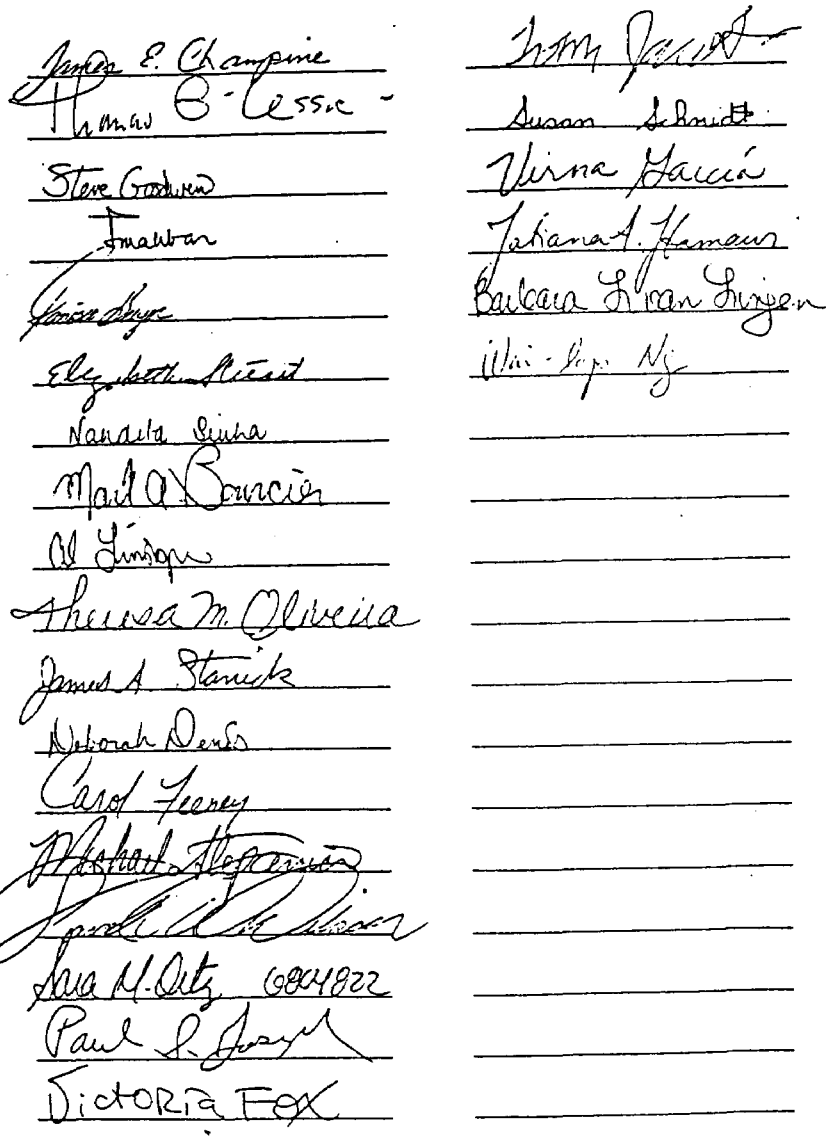
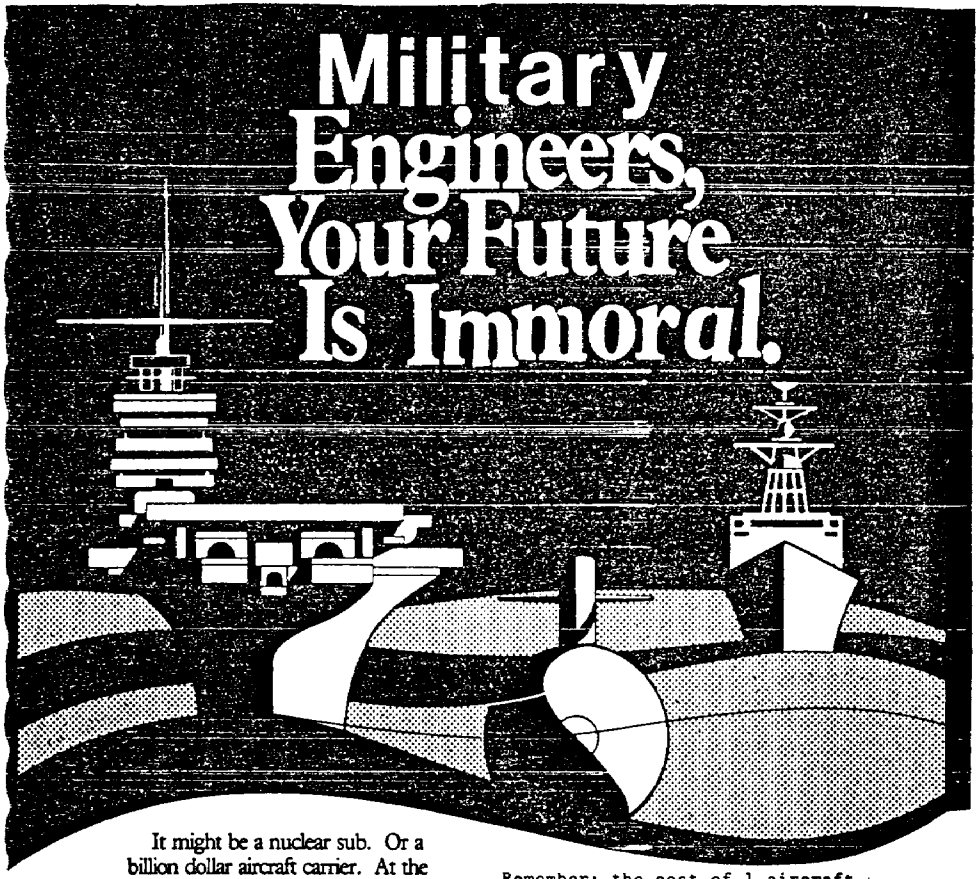


Neutrality is a Farce

Alan Ditmore

I'm considering leaving engineering school, and the primary reason is social and political isolation, alienation and lack of support. This is caused by my teachers, my peers and even my textbook writers. I end up squirreled away solving problems that seem irrelevant to anything or surrounded by people who I can only consider enemies. I've never been so disgusted by a group of people in my life. I'm sick of walking into class everyday and being surrounded by the kind of people who would do research for imperialist war. As far as I can see, these people are motivated by nothing but personal greed. They love to be "apolitical," that is, to ignore oppressed people and to happily behave as if there is no world going on around them. Political neutrality is a transparent excuse for reckless self interest, and a willingness to ignore the welfare of others in a blind pursuit of personal gain. I never want to sit in th same room with these people again. We need to stop treating those who ignore us better than we treat those who oppose us. At least the *Minutemen* acknowledge our existence.

I'm also convinced that the Mechanical Engineering department purposely ignores questions about why we are learning what we are learning. We end up solving problems in total detachment from any purpose. The best answer I seem able to get is "That's what General Electric wants." Why, so they can bring good things to life? I have no idea how Benjamin Linder managed to put up with four years of this kind of detachment.



Your future is immoral

University Career Center Placement Manual

Peter Sakura

The graphic, "Your future is immoral" was made by Peter Sakura. It was produced in several sizes, including a version big enough for a demonstration poster. This poster was carried at demonstrations in favor of abortion and against death research. Peter Sakura, a UMASS undergraduate, has been active in both the feminist movement and the anti-death research movement.

As I begin this essay, outside my window the chirping of birds is drowned out by the noise of a C-5, the world's largest airplane, a military airplane, passing overhead periodically on maneuvers.

At first, my awareness of the militarization of the University of Massachusetts was vague. Besides ROTC and the National Guard, I saw my school as being relatively free of this country's armed disservices.

Last fall, it became partially apparent that the Department of Defense, the largest federal department, uses UMASS/Amherst as one of its preparatory schools when I read the University Career Center's thirty-eight page **Fall 1988 Placement Manual**. The placement manual starts out with twenty pages covering topics like: UCC services, job search strategies; resume writing and interviewing. Then, following about a page discussing liberal arts are sixteen pages of advertisements for the military-industrial complex. The first ad says to contact MIT Lincoln Laboratory if you're interested in things like radar imaging or artificial intelligence. Then you see an eagle clutching lightning bolts and missiles and the seal of the U.S. Naval Weapons Center, whose ad, aimed at graduating scientists and engineers, also features a masked pilot looking at you from the cockpit of a jet fighter.

Next, a Raytheon ad defines "Quality - In Perfect Balance With Advanced Technology." In Norfolk Naval Shipyard's ad, an aircraft carrier, a nuclear submarine and a battleship inform you, "Engineers, Your Future Is With Us." Moving on, "Anything is possible at Wang." "They're All in on the Secret...They've All Found Careers with CIA." Sanders, a Lockheed company, we learn,

"is engaged in the development, manufacture, and sale of advanced defense electronic systems and products.... Salaries are highly competitive and each employee is paid medical and dental coverage for employees and eligible dependents. Our benefits package also includes life insurance, sick leave, short- and long-term disability, business travel insurance [in case terrorists blow you up], thrift and pension plans, paid vacations, holidays, relocation allowance, and a credit union. Sanders also currently provides 100% tuition coverage for work-related courses [academic freedom!] and has several advanced degree programs on the premises. [More academic freedom!]

United Technologies brings more photos of U.S. jet fighters to the placement manual, which ends with an ad for the National Security Agency. "NSA. The opportunities are no secret."

186 South Street
Boston, MA 02111
(617) 423-0650

make Amherst a
Biological Weapons
Free Zone

COMMITTEE FOR RESPONSIBLE GENETICS

May 1,1989

Dear Town Meeting Member:

After forty years of living with nuclear weapons, we have realized that there is no way to win a nuclear war, and that we must do something to lessen the stockpiles of these weapons. In 1984, the Town of Amherst voted to make Amherst a nuclear weapons free zone. In doing so, it joined hundreds of other communities across the country in the call for a halt to the nuclear arms race.

Today you, as a representative to Town Meeting, are being asked to take a similarly historic step: to declare Amherst a biological weapons free zone. In doing so, Amherst will become the first community to take a concrete step to strengthen the barriers to the development and use of biological weapons.

This decision will affect not only the quality of life in Amherst, but will send a message to Congress, the present Administration, and indeed the international community that the citizens of Amherst support the spirit of the strongest disarmament treaty in existence.

This treaty, the Biological Weapons Convention of 1972 bans the development, stockpiling, and production of biological weapons. It is the only treaty to ban an entire class of weapons, and sets a precedent for other disarmament treaties.

The treaty does leave open the possibility of research for prophylactic, protective, or other peaceful purposes. However, due to the nature of biological weapons themselves, offensive and defensive research programs are virtually indistinguishable. Therefore any research in this program, and particularly a program accelerating at the rate of the Biological Defense Research Program, has the character of destabilizing this most important of treaties.

The Reagan administration justified all research in the current program in the name of defense. But there is no defense against a biological weapons attack. Unlike chemical or nuclear weapons, biological weapons are alive and have the ability to reproduce themselves. The very concept of defending against such agents is misleading because the spread of disease is so unpredictable and the range of potential biological agents is so large.

cu over

We are in a period of time when we desperately need increased biomedical research to deal with current health problems such as AIDS and heart disease. The Biological Defense Research Program is diverting human and fiscal resources in a direction that if allowed to continue will only generate new scourges for the human race.

The town of Amherst is presented with a unique opportunity today, for we stand at a crossroads. In one direction lies a strengthened treaty against the development, stockpiling and use of biological weapons, in the other direction a new and unpredictable dimension of the arms race. The next two years will be critical in determining which direction we go. The citizens and the governing bodies of all countries possess a capacity and a responsibility to act collectively to reinforce the treaty prohibiting biological weapons.

Just as the threat of nuclear war affects every community, so too does the threat from biological weapons. Local initiatives are the avenue where citizens create the democratic pressure necessary for a halt to the nuclear arms race. And through local initiatives, such as the one before you at the upcoming town meeting, the citizens of Amherst can add your voice to curb the threat of biological weapons.

It is the Biological Weapons Convention of 1972 that the Biological Defense Research Program threatens to undermine. Real national security lies with strengthening international renunciation of the use and development of biological weapons, not with provocative and destabilizing research programs. It is only through giving the treaty a vote of confidence that the town of Amherst can uphold and strengthen these barriers.

Thank you for taking the time to read this letter and the enclosed package. A victory would surely be won if Amherst adds its voice to the growing numbers of scientists, citizens and legislators of this country who are working to keep the biomedical sciences as a technology for human welfare and for enhancing, rather than destroying human life.

Sincerely yours,

Nachama L. Wilker

Nachama L. Wilker
Executive Director

POLITICAL ADVERTISEMENT

PHYSICIANS CALL FOR A HALT TO ARMY-FUNDED ANTHRAX RESEARCH AT U. MASS

As physicians, we suppport scientific research to promote public health. However, we feel strongly that research intended enhance the Pentagon's ability to wage biological warfare is a grave threat to the people of the world.

These are the facts:

- The first biological weapons produced by the US were anthrax bombs for possible use in World War II.
- The Army research at U. Mass is aimed at developing an improved vaccine for the protection of US troops. *(Source: US Army Draft Environment Impact Statement on the Biological Defense Research Program, May, 1988)*
- Vaccines play no role in protecting against an attack by biological agents. *Because there are so many biological weapons, it is nearly impossible to know which weapon or weapons might be used by an aggressor. And it is impractical to vaccinate US troops against all such potential weapons.*
- Vaccines **are** useful adjuncts to the offensive use of germ warfare. *If you know which agent you are planning to use, you can immunize a segment of your armed forces so that they can operate in the enemy area you have contaminated.*
- The Army's Biological Defense Research Program, which funds the U. Mass anthrax research, saw the largest exponential growth of any military program during the Reagan administration.

IN 1972 MORE THAN 100 NATIONS, INCLUDING THE US, SIGNED THE BIOLOGICAL WEAPONS CONVENTION PROHIBITING THE TESTIN PRODUCTION, AND DEPLOYMENT OF BIOLOGICAL WARFARE AGENTS. THE US SHOULD WORK TO STRENGTHEN THIS TREATY, NC UNDERMINE IT WITH GERM WARFARE RESEARCH.

LET US CALL A HALT TO THIS NEW ARMS RACE BEFORE IT IS TOO LATE.

Ira S. Addes, M.D.
Elizabeth C. Anderson
Stewart Ascher, M.D.
Charles W. Austin, M.D.
Andrew Balder, M.D.
M.J. Barchman, M.D.
Catherine Bartlett, M.D.
Alan Bauerlin, M.D.
Nanette Bershof, M.D.
Jo-Anne Bessette, M.D.
Peter Benjamin, M.D.
Bruce S. Bleiman, M.D.
Joan K. Bourichus, M.D.
Norman D. Brown, M.D.
David L. Clinton, M.D.
Thomas J. Crowe, M.D.
Alan L. Dayne, M.D.
Diane DeBernardette, M.D.
Thomas Dewmashkin, M.D.
David J. Doyle, M.D.
Joyce E. Duncan, M.D.
Stephen A. Epper, M.D.
Barry D. Elson, M.D.
Robert M. Fishman, D.O.
Paul S. Flandreau, M.D.
Kenneth M. Frankel, M.D.
Michael J. Freeland, M.D.
Eaire E. Freeman, M.D.
Merritt F. Garland, Jr., M.D., M.P.H.
Samuel Gladstone, M.D.
David Gottsegen, M.D.
Andrew F. Hall, M.D.
Harriet L. Hardy, M.D.
Ira Helfand, M.D.
Steven Hickman, M.D.
Katherine M. Hicks, M.D.
C. Richard Hinckley, M.D.
Richard K. Jennings, M.D.
Eaiers Jones, M.D.
David Katz, M.D.
Jonathan Kurtis, M.D.
Alicia Landman, M.D.
Andrew Larkin, M.D.
Harvey Lederman, M.D.
Thomas H. Levin, M.D.
Edgar Lindsey, M.D.
Naomi London, M.D.
Merritt B. Low, M.D.
Robert MacDonald, M.D.
Andrew Mackey, M.D.
Edward J. Maxwell, M.D.
Thomas Marantz, M.D.
David Marsh, M.D.
Pamela McCarthy
Frank Meyers, M.D.
Ross Miller, M.D.
A. Ron Miller, M.D.
Meryl Nass, M.D.
G. Francis Osborne, D.M.D.
Arthur Paladino, M.D.
Norman Parr, M.D.
Paul Redstone, M.D.
Gary Reiser, M.D.
John K. Rhicard, D.M.D.
Henry Rosenberg, M.D.
Lincoln Russin, M.D.
Heather Z. Sankey, M.D.
Carl Sartano, M.D.
Jeffrey Scanton, M.D.
Gulab K. Shah, M.D.
Peter Siersma, M.D., Ph.D.
Henry Simkin, M.D.
Robert S. Slocum, M.D.
Deborah Smith, M.D.
William Smith, M.D.
Marshall Stambousky, M.S.
Christopher H. Strachorn, M
Jean Tafari, M.D.
Y.T. Tafari, M.D.
Alexander Thomas, M.D.
John Waldman, M.D.
Bruce Wennaub, M.D.
Peter Weitzman, M.D.
Robert Weitzman, M.D.
Joseph L. Wolfson, M.D.
Lynn Zasher, M.D.
Jeffrey Zucker, M.D.

Paid for by Physicians for Social Responsibility / Pioneer Valley, 15 Mt. Pollux Dr., Amherst, MA 01002, Ira Helfand, Leeds

FACT SHEET ON UMASS ANTHRAX STUDY

The American Friends Service Committee of Western Massachusetts has launched a campaign to stop the anthrax research on the University of Massachusetts-Amherst campus. The research raises serious questions regarding the health and safety of our community and our environment. Furthermore, it aids an effort by the U.S. Army to strengthen its biological warfare capability, an effort that has no place at an institution of higher learning.

For the past eight years, UMass-Amherst, with some $1 million in funding from the U.S. Army, has been conducting research involving the genetic material of the anthrax disease. The research is part of the U.S. Army's Biological Defense Research Program.

What is anthrax?

Anthrax is an extremely dangerous disease that affects domestic animals and humans. Humans often contract the disease through contact with infected animals. If contracted in this way, the disease causes black skin ulcers on the body which can lead to blood poisoning. It kills about one-fifth of people who get infected in this manner. If infection is caused by inhalation, however, the disease is much more deadly. Anthrax kills nine out of every ten humans who contract it through inhalation.[1]

What is the relation of anthrax to biological warfare?

Anthrax was first produced as a biological weapon in the 1940s. The weapon has been made as an air-bursting bomb aimed at infecting humans and animals through inhalation--thereby causing the greatest amount of destruction possible.

What happened at Gruinard Island?

The anthrax bacteria have the ability to form spores which can survive in the environment for decades. In the early 1940s, scientists tested the strength of anthrax bombs on the island of Gruinard (off the coast of Scotland). Following their testing, the island was declared unsafe and off limits to the public. Forty years later, the island remains contaminated.[2]

* * *

Anthrax researchers at the UMass-Amherst campus argue that their work is strictly defensive in nature. Yet many in the scientific community say that there is no difference between offensive and defensive research. As MIT biologist Jonathan King recently wrote in the magazine *Science for the People*, "The data gained from 'defensive' BW (biological warfare) testing is the same information needed to develop offensive capability."[3]

King also points out that research contracts from the military, such as that involving anthrax at UMass, are not designed for the benefit of society as a whole:

> The argument that military funds for biomedical research, such as vaccines, are beneficial is fallacious. Increased vaccine research is desperately needed and should be funded by the National Institutes of Health. Military-funded vaccine research has military goals, whether the individual investigators can perceive them or not. Furthermore, a vaccine for truly defensive use would have to be developed secretly, since it would be useless if the adversary knew of its existence. Vaccine development is, in fact, more important for vaccinating troops in advance of an offensive BW (biological warfare) attack."[4]

Finally, the U.S. Army has a long record of hiding the truth regarding its chemical and biological research work. According to a recent report in *The Nation* magazine by Charles Piller--co-author of *Gene Wars* with microbiologist Keith Yamamoto--the Army lied extensively to a U.S. Senate subcommittee in 1977 regarding its biological warfare testing program of the 1950s and 1960s.[5] Given this track record, how are we to know that the Army is not lying to us now regarding its Biological Defense Research Program?

* * *

AFSC needs your help today on this campaign. Here's what you can do:

- Write Chancellor Joseph Duffey of UMass (University of Massachusetts, 374 Whitmore Administration Building, Amherst, MA 01003) urging him to halt the anthrax research immediately.
- Circulate the AFSC petition to Chancellor Duffey. (Copies of the petition can be obtained from the AFSC office, 3 Langworthy Road, Northampton.)
- Write a letter to your local newspaper expressing your concern on this issue.
- Join the AFSC task force working on this campaign. For more information, please call the AFSC office, 584-8975 (day) or 369-4292 (evening).

Footnotes:

[1]Robert Harris and Jeremy Paxman, *A Higher Form of Killing*, Hill and Wang, New York, 1982, page 70.

[2]Sean Murphy et al., *No Fire, No Thunder*, Monthly Review Press, New York, 1984, page 37.

[3]Jonathan King, "Biology Goes to War," *Science for the People*, Science Resource Center, Cambridge, January/February 1988, page 19.

[4]Ibid, page 20.

[5]Charles Piller, "Lethal Lies About Fatal Diseases," *The Nation*, The Nation Co., New York, October 3, 1988, page 271.

What anthrax vaccine?

THE PUBLIC HEALTH RESEARCH INSTITUTE
455 FIRST AVENUE, NEW YORK, N. Y. 10016
TEL. (212) 578-0800
FAX (212) 578-0804

Office of the Director

May 2, 1989

Dr. Diana Stein
Dept. of Biology
Mt. Holyoke College
South Hadley, Mass.

Dear Dr. Stein:

The hearing on anthrax research at UMass was a most enlightening experience and I would like to express my personal appreciation of the even-handedness with which you conducted it.

In retrospect, it would seem that within the format of a public hearing it is difficult to introduce new and fairly complex technical material and therefore I have prepared a more detailed explanation of my comments in the hope that you and the other Board members will be able to look at it under less trying circumstances. I enclose a copy of the paper by Thorne and co-workers from the January 1989 issue of the Journal of Bacteriology, in which I have highlighted the material that is especially relevant (see pp. 105, 110, 112, especially). I offer the following explanation of this material:

pXO12 is a plasmid from *B. thuringiensis* that encodes a conjugation system that enables it to be transferred to other bacteria at very high frequency (over 1% per donor organism). pXO12 can readily be transferred to *B. cereus* and *B. anthracis*, where its conjugation activity is similar or identical to that in its native species. pXO12 can mobilize (i.e., cause the transfer of) any other plasmids present in the same host strain, including pBC16, a small plasmid encoding tetracycline resistance, as well as pX01 and pX02, the *B. anthracis* toxin and capsule plasmids. Using a donor strain containing three plasmids, pX012, pBC16, and either pX01 or pX02, they (Thorne, *et al.*) observe high transfer frequencies for pBC16 (1-2% per donor cell) and low frequencies for pX01 or pX02 (= 10^{-5} per donor cell).

These experiments are disturbing because they involve the creation of antibiotic resistant strains of *B. anthracis* that are capable of transferring their resistance at high frequency. This is particularly relevant because there have been no reports of *B. anthracis* containing conjugative plasmids or resistance plasmids. I would point out that the NIH guidlines for recombinant DNA research prohibit the transfer of antibiotic resistance (by molecular cloning) to species where it does not occur naturally. While Dr. Thorne's group is not using cloning techniques, I believe that a similar moral (if not legal) restriction would apply; although it may be possible for the events performed in Dr. Thorne's lab to occur naturally, these events would have a vanishingly low probability outside of a lab setting.

Much more disturbing are the experiments described by Dr. Thorne's group in which the conjugative plasmid (pX012) and either of the virulence plasmids (pX01 and pX02) have become physically linked, forming joint plasmids that are capable of transferring pX01 with its toxin genes or pX02 with its capsule genes at the same high frequency (of the order of 1% per donor bacterium) as the conjugative carrier plasmid (see Fig. 2 lane 5, band (a) on p. 108). These strains constitute a serious biohazard because a very minor lab accident - such as a contaminated mechanical pipetter -

could bring two strains into contact in sufficient numbers (a few hundred bacteria) to generate fully virulent *B. anthracis*; as such an event would almost certainly escape detection, the first sign of it might be the occurrence of anthrax in laboratory or service personnel. Note that there is a large variety of *B. anthracis* and *B. cereus* strains in Dr. Thorne's lab that contain either pX01 (toxin plasmid) or pX02 (capsule plasmid). Any of these strains would be rendered fully virulent by the acquisition of the other plasmid. Additionally, such antibiotic resistant high frequency donor strains will inevitably reach the environment where they will have a very high likelihood of participating in genetic exchange with other soil bacteria with unpredictable consequences. Note that the strain shown in Fig. 2 lane 5 is *B. cereus* 569 UM20-4 containing pBC16 (tetracycline resistance) plus the pX012::pX02 composite. Despite Ms. Heemskersk's testimony to the contrary, *B. cereus* 569 is highly resistant to penicillin due to its ability to produce a powerful penicillin-degrading enzyme (β-lactamase). In fact, it is the source strain for commercially produced penicillinase - *B. cereus* 569 β-lactamase is classically the scientific counterpart in bacilli of β-galactosidase in *E. coli* K12. Acquisition of pX01 by this strain would create a fully virulent *B. anthracis*-like *B. cereus* strain resistant to penicillin and tetracycline, and capable of acting as a high-frequency donor.

Finally, strains capable of high-frequency transfer of antibiotic resistance and *B. anthracis* virulence determinants offer the possibility of constructing a variety of novel bioweapons, limited only by one's imagination. One simple example would be a binary bioweapon (parallel to the binary nerve gas weapons) in which two avirulent strains, each carrying one of the virulence plasmids would be mixed, creating the fully virulent strain en route, by means of the high-frequency gene transfer system developed in Dr. Thorne's lab. The numbers here are potentially more than adequate - if the mixed culture contains 10^{11} organisms, optimal transfer (1%) would produce 10^{9} virulent ones - probably enough to kill a million people.

A last point is that, although Dr. Thorne's program is listed as one aimed at developing a new vaccine, there is no published evidence to suggest that his research has addressed vaccine production; merely stating that "a better understanding of the genetics of *B. anthracis* could lead to an improved vaccine" in no way justifies calling this program "vaccine research." While it is conceivable that other species containing *B. anthracis* virulence plasmids could be tested as vaccine strains, there are much better ways to develop such strains (see, for example, Tippetts and Robertson, 1988, J. Bacteriol. 170: 2263-2266). Moreover, Dr. Thorne has had *B. cereus* and *B. thuringensis* strains containing *B. anthracis* plasmids since 1985 and has yet to describe their immunological properties. One must conclude that the potential for novel bioweapons plus the obvious biohazards inherent in these strains far outweigh any possible usefulness they may have for vaccine development and therefore that the possession of these strains is a direct violation of the 1972 Biological Weapons Convention, which prohibits the possession of microbial strains of types or in quantities that cannot be justified for prophylactic or peaceful purposes.

I would be happy to provide further information on these points.

Sincerely yours,

Richard Novick, M.D.