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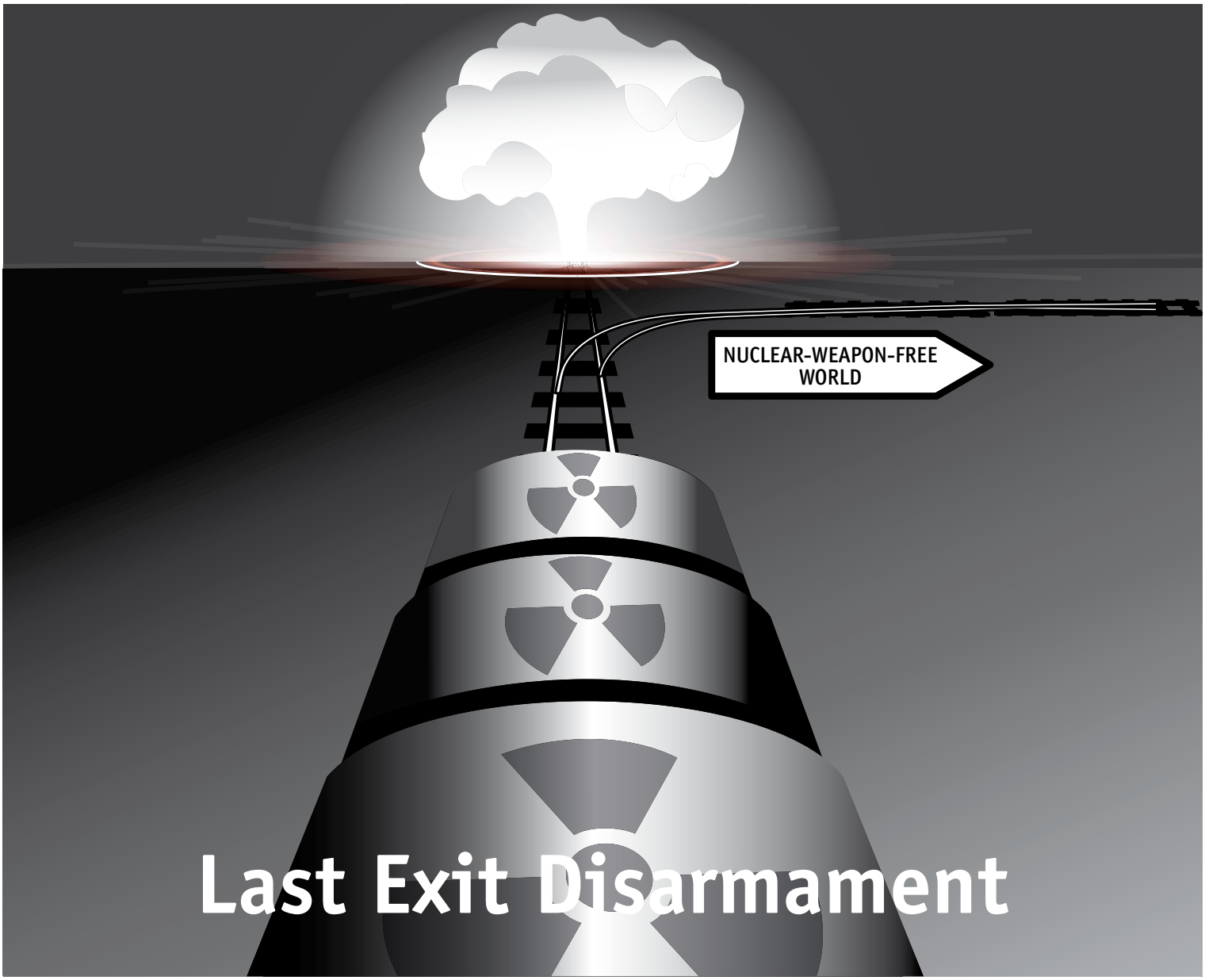

World at the Crossroads

Nuclear Winter | US Nuclear Weapons | Iran's Missiles | Missile Defense in Europe
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World at the Crossroads

Nuclear Threats, Climate Risks, and the Future of Nuclear Disarmament

EDITORIAL BY JÜRGEN SCHEFFRAN

In January 2009, George W. Bush's second term as President of the United States will come to an end. Where is the world after eight years of his presidency?

- The Iraq War, justified by false accusations, has cost more than $500 billion in direct costs and may end with total costs of more than $3 trillion. It has taken the lives of more than 4,000 US soldiers, and a much larger number of Iraqis, estimated from between 150,000 and one million people.
- Preemptive strike doctrines threaten states with nuclear capabilities and ambitions, making nuclear war more likely. US missile defense programs in Eastern Europe provoke harsh reactions from the Russian government, reminiscent of the Cold War. The relationship with China is undermined by US missile defense programs and plans for dominance in space. Both China and the US have tested anti-satellite weapons which could spur an arms race in space.
- The US threat against so-called "rogue states" has not prevented them from continuing their nuclear programs: North Korea exploded a nuclear device in 2006 and Iran remains unimpressed by the threat of intervention. Furthermore, the proposed nuclear deal between India and the United States would set a bad precedent for nuclear proliferation.
- The "War on Terror" has consumed enormous resources and restrained civil liberties but was not able to capture Osama Bin Laden or disintegrate Al Qaeda. Despite some initial sympathies for the United States after 9/11, the reputation of the US in the world has plummeted, even among NATO allies.
- The US Administration has blocked progress on nuclear disarmament. The Anti-Ballistic Missile Treaty has been abrogated and the START disarmament process was abandoned. The Non-Proliferation Treaty and the Biological & Toxin Weapons Convention are at stake. The Outer Space Treaty is disregarded, the Comprehensive Test Ban Treaty has not been ratified, and a Fissile Material Cut-off Treaty has not been agreed upon. The 2002 Moscow Treaty does not specify a nuclear reduction process and has no verification mechanism.
- The US has failed to make substantial investments into sustainable energy. Fossil fuel and nuclear energy paths have been promoted, contributing to future vulnerabilities.
- The US government has prevented major progress on fighting climate change, against the will of the large majority of the world. The additional carbon emissions over the past eight years will have lasting impacts over centuries and may trigger tipping points in the climate system.

Climate change will likely threaten national and international security, as recent studies have analyzed. The Intergovernmental Panel on Climate Change (IPCC) has addressed serious risks that could undermine the living conditions of people all over the world. The degradation of natural resources, the decline of water and food supply, enforced migration, and more frequent and intense disasters will have severe security impacts. Climate-related shocks will add stress to the world's existing conflicts and act as a "threat multiplier" in already fragile regions. The 2007 Nobel Peace Prize to Al Gore and the IPCC indicates the growing relevance of the security-climate link.

In his recent book *The Seventh Decade*, Jonathan Schell asks why the threat of nuclear war receives much less public attention today than global warming, although both have a great deal in common: "Both put stakes on the table of a magnitude never present before in human decision making. Both threaten life on a planetary scale. Both require a fully global response. Anyone concerned by the one should be concerned with the other. It would be a shame to save the Earth from slowly warming only to burn it up in an instant in a nuclear war." Conflicts induced by climate change could create more incentives for nuclear proliferation. A nuclear arms race would waste resources and undermine cooperative solutions of climate change. Nuclear war itself would severely destabilize human societies and the environment, not to speak of the possibility of a nuclear winter.

The nuclear train is rolling towards the precipice, and more countries have joined the train in the past decade. Many more could acquire basic nuclear technology through the nuclear energy renaissance that is expected in response to growing energy needs and the decarbonization of energy supply. The only way to avoid nuclear disaster is to change the course of the nuclear train towards a nuclear-weapon-free world and make the transition towards a more secure and sustainable future. The world is waiting for the next President of the United States to make this change and move from the lost decade to a future decade of disarmament.

Some of the issues are covered in this volume. Steven Starr assesses the potential climatic consequences of a limited nuclear conflict. Andrew Lichterman highlights the future developments of nuclear weapons in the USA, and Erika Simpson discusses the implication of continued US reliance on NATO and the NPT. The possibly destabilizing link between Iran's missile program (Bharath Gopalaswami) and the US missile defense in Eastern Europe (Jan Kavan) is analyzed by Jürgen Altmann and Götz Neuneck.

Ways to leave the risky path are suggested in other contributions of the Bulletin. The transformation to a nuclear-weapon-free world through a Nuclear Weapons Convention (Jürgen Scheffran) provides an alternative to a continued nuclear and missile arms race, building on the updated Model NWC presented at the 2007 NPT conference. A technical analysis is given on the verifiability of a Fissile Materials Cut-off (Hui Zhang) and the environmental detection of uranium enrichment (Jens Bösenberg and Martin Kalinowski). Frank von Hippel and Richard Garwin describe their lifelong efforts to provide scientific input into the policy decision-making process. Forward-looking policy issues have been presented to the UN General Assembly by Jackie Cabasso and Rhianna Tyson.

Champaign, April 25, 2008

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The U.S. Military's Influence on Nanotechnology Research in Latin America

GUILLERMO FOLADORI

Merchandise containing nanotechnology elements, like any other commodity, must be tested in the market to prove their superior utility and/or their competitive price against other conventional products. Consumption has an important role to play in order to evaluate the utility and the relative price of merchandise. Companies act in response to the market by improving the product in order to improve competition. But if at any time the goods cause undesirable secondary effects, they risk being taken out of the market causing damage to the supplying company.

Military merchandise is also evaluated by the users but, in contrast to civilian goods, military supplies are consumed during warfare. The utility of the product is measured according to its efficiency during combat, by deceiving defense systems of the enemy or in espionage missions, etc. Military technology, whether for combat or surveillance, can only be proven under fire in the theater of combat. Accordingly, the United States Army considers the main objectives for nano-electronic research and development to be: increase survivability through situational awareness, increase mobility through electronics, reduce operating and support costs, increase C4ISR[1] and lethality, increase sustainability, and reduce the logistics footprint.[2]

When the US launched its program to support nanotechnology development, it allocated a third of the overall budget for military research to this purpose – a level that has been maintained, between one third and one fourth.[3] This policy encourages other countries to invest in nanotechnology for war.[4]

Within Latin America, nanotechnology research is in its initial stages. The same applies for military nanotechnology research, although there are several agreements amongst countries to integrate this area into the agenda. However, it is important to note the increasing presence and sponsorship of the US armed forces in this field.

Scientific Neutrality Put Into Question

It is likely that most of the Latin-American scientists that participate in research projects or in meetings financed by U.S. military institutions do so thinking that their research is pure science;[5] nanoscience, and not nanotechnology; or, in other words, basic research containing no real application. This was a topic of heated debate and discussion, above all after the U.S. deployed nuclear bombs over Hiroshima and Nagasaki at the end of the Second World War. It is worth noting two important contemporary aspects: the first refers to the continuous decrease of the distance between time and practice of what are called the basic sciences and their practical use. The continuous entrenching of capitalist competition exerts pressure to decrease the cycles for capital rotation. Burrus & Gittines[6] show how, in the last one and a half centuries, the distance between the discovering of a given invention and its introduction to the market has systematically been reduced. The result of this is the development of commercially driven science, mainly concerned with commercializing as fast as possible the new potential goods. In this context, nanotechnology is an eloquent current example. The U.S. Department of Defense (DoD) intends "(t)o accelerate the transition of materials from concept to service… should budget research-to-development transition funds and devise a method to select early the materials advances on which to concentrate funds. DoD should adopt measures to enhance communication between materials researchers and users."[7]

Moreover, the Mansfield Amendment of 1973 limited the scope of the defense related budget – through the U.S. (Defense) Advanced Research Projects Agency – exclusively to projects with direct military application.[8] Consequently, the possibility for the DoD to finance pure science is legally banned unless it has a direct military application.

The second aspect that blurs the boundary between nanoscience and nanotechnology is the fact that there is a direct involvement of physics specialists, chemists and biologists in parallel to the participation of engineers, informatics technicians and others in the process of research and development (R&D) of knowledge. The U.S. initiative on nanotechnologies targets "converging technologies" at the interface between nanotechnology, biotechnology, informatics technologies, and cognitive sciences. A document from UNESCO related to the *Ethical and Policy Aspects of Nanotechnology* illustrates how the development of basic research requires the use of tools, practices, materials and techniques that are essentially technology, like computers, software, microscopes and the use of instruments to manipulate and to measure chemical and physical properties.[9]

From the perspective of the scientists involved in the field there is a clear difference. Nanotechnology has, among other virtues, its tiny size and the fact that at this

scale materials present different properties. Thus this technology can be applied in any branch of the production process and/or services. Hence the inventions from the war industry can be redesigned for serving civil purposes and vice versa. This way, the war industry, by employing nanotechnology, can transform any civil invention into a military application. In 1999, the DoD handed over the responsibility of identifying key materials and the research and development of ways to incorporate them into the defense system to a special committee. This committee, the National Materials Advisory Board, released a publication in which it identified the most important areas for concentration: structural and multifunctional materials, energy and power materials, electronic and photonic materials, functional organic and hybrid materials, and bio-derived and bio-inspired materials. Due to the extensiveness of these areas of study, the committee established a separate panel to address each one. It now seems difficult to think that the military would not obtain any benefit from the civil innovations. What would be the difference, then, between research directly sponsored by the military or by a civil institution? The difference can only be answered according to mere ethical positions: either in favor of peace or in favor of an active military science and technology (S&T).

It is possible that many of the Latin American scientists who take part in research or reunions sponsored by the military system of the U.S. do not understand the real interests of the U.S. in its curiosity towards their modest investigations. In the end, their involvement with the scientific world is based on the relations they have with their counterparts in the U.S.; in addition, many of their fellow countrymen hold positions in U.S. universities; they speak the same language and have the same habits. Generally they speak about sensors, multifunctional materials, carbon nanotubes, and hybrid materials, topics that are difficult to relate to military applications. However, for the DoD the relationship is clear, there is nothing completely distinct from military interest, as the National Materials Advisory Board explained: "As the United States, its institutions, and its citizens interact throughout the world, situations may arise that call for military force. To safeguard its interests for the foreseeable future the United States must be able to project military power around the globe…

Whereas other nations tend to operate from their own territory, as a matter of strategic principle the United States projects military power over long distances with medium-range and short-range systems."[10]

For this reason, the U.S. International Technology Center, which is one of the main organizations sponsoring nanotechnology research in Latin America and in the world, has as its mission: "To support the identification, acquisition, integration and delivery of foreign technology solutions to the warfighter to ensure technological superiority on the battlefield."[11]

Direct Presence of the U.S. Military in Latin American Nanotechnology Research

In certain research centers within Latin America, nanotechnology study has been conducted since the 1990s. However the most important stimulus came into being at the beginning of the 2000. The first official effort to encourage nanotechnology development took place in 2001 in Brazil, although the later Nanoscience and Nanotechnology Program implemented in 2004 is considered the most robust. In Argentina, the Argentinean Nanotechnology Foundation was created in 2005. In Mexico, without any official direction, approximately 500 researchers work in branches related to nanotechnologies in more of a dozen institutions or research centers. These three countries are those where nanotechnology R&D is most advanced.[12]

The U.S. military interest in the development of S&T in Latin America is explicit; and even though much of the information related to the financing and human resources for this effort in Latin America is available online, direct contacts are always the basis for personal bonds which facilitate future collaborations. This is probably why, in April 2004, the U.S. Navy and Air Force hosted a forum in Washington, D.C., called the *Latin America Science & Technology Forum*. The explicit purpose for this forum was to increase the U.S. leadership's awareness of the progress of S&T in Latin America.[13] High representatives of civil institutions of S&T were present, from Argentina (vice-director of CONICET), from Chile (Director of FONDEF-CONICYT) and from Mexico (Director for scientific research of CONACYT).[14] They presented the state of S&T in their countries. This happened as if it were a responsibility for these civil institutions to inform the U.S. military about the general condition of the leading S&T that was taking place in Latin America. These personal contacts were complemented with official visits to Latin American countries. At the end of March 2002, the Associate Director of the International Area for Research of the U.S. Navy visited the University of Concepción in Chile, with the purpose of identifying research areas that could be incorporated into a special program on scientific cooperation.[15]

The U.S. armed forces have at least three branches that finance scientific research (including nanotechnology) in public and private universities and in research centers world wide: the Army, the Navy and the Air Force. These three arms work together in S&T around the globe inside the International Technology Centers (ITC). To

be more effective there are several ITCs per geographical area. The ITC-Atlantic is headquartered in London and covers Europe, Africa, and parts of Asia, including some former Soviet Union countries; the ITC-Pacific, headquartered in Tokyo, covers the rest of Asia and the Southern part of Africa; and in 2004, the ITC-Americas was created and is headquartered in Santiago de Chile to cover Central and South America and the Caribbean, including Canada.[16] As with the other ITCs, the objective of the ITC-Americas headquartered in Santiago de Chile is "...to foster cooperative relationships between the U.S. Army and private sector, university, and civilian government research and development (R&D) entities that result in leading-edge scientific and technological cooperation that benefit the civilian institutions and support the U.S. Army's current programs and future goals."[17]

Direct support for nanotechnology-related research in Latin America became reality. According to the U.S. Navy's webpage, it has been financing a project at the Bariloche Atomic Center in Argentina in collaboration with the University of Michigan, Brown University, and the Naval Research Laboratory since 2004. In the same year a similar project was launched at the University of São Paulo in Brazil.[18] In order to finance any given project, the U.S. army has to know the profile of the potential scientists who are willing to cooperate. For that reason, the U.S. Navy in partnership with the U.S. Air Force organized three international workshops in Latin America related to the main area of interest for the DoD, that is, multifunctional materials.[19] The technological tools for creating these new materials are both micro- and nanotechnology; therefore, they are of the most interest to the U.S. Army and the U.S. Air Force regarding S&T in Latin America.[20]

Accordingly, "The multifunctionality implies coupling between structural performance and other as-needed functionalities such as electrical, magnetic, optical, thermal, biological, and so forth. Structural integrity includes durability, survivability, reliability, and maintainability. This program thus focuses on developing and applying multifunctional mechanics principles and design methodology based on physics, chemistry, biology, and artificial intelligence to model and characterize the processing and performance of multifunctional material systems and devices at multiple scales…"[21]

Most of the seminars were organized by Latin Americans who work at U.S.-based universities, therefore facilitating contacts with scientists in Latin America. Although most of the participants were from the U.S., more and more Latin American scientists participated in the seminars. The participation went from less than one fourth Latin American scientists at the first seminar to almost a third in subsequent encounters.[22]

The U.S. military involvement in nanotechnology research in Latin America can not be reduced to merely the activities of military institutions in S&T. There are general agreements which stealthily support the possibility for future research in the area. The Mexican Government is one example. In 2005, Mexico signed, together with the U.S. and Canada, the Security and Prosperity Partnership of North America (SPPNA). This treaty includes, within its mandate, scientific collaborating schemes for R&D in areas such as biotechnology and nanotechnology, under a framework influenced directly by the military sectors.[23] There are several agreements signed between Mexican and U.S. institutions with an explicit participation of military laboratories, like the case of the Sandia Laboratories in New Mexico.[24] The influence of the military over nanotechnology research not only comes from the relation between the civil sector and the U.S. military, but also from the Latin American armies who discuss the possibilities of using S&T for their own interests. On June 2006, in Buenos Aires, Argentina, representatives of several Latin American armies got together at the conference *The Contribution of Science and Technology to Support Peace Keeping Operations and Disaster Relief Operation in Catastrophes.* They came from Argentina, Bolivia, Brazil, Canada, Chile, Colombia, Dominican Republic, Ecuador, El Salvador, Mexico, Guatemala, Nicaragua, Paraguay, Peru, Uruguay, and Venezuela. The expected results went beyond the title of the conference, as it was recommended that for subsequent reunions certain topics should be discussed, such as the application of non-lethal technologies for crowd control; water purification and distribution; electric power generation and food preservation.[25]

Not Everybody Agrees

The debate that was unleashed after U.S. military involvement in some nanotechnology research in Argentina was made public shows the necessity to increase the transparency of information. In addition, it is important to build mechanisms to encourage public discussion about the implication of this technology for the region.

In October 2004, the Ministry of Economics of Argentina announced that the government was working towards a plan to develop nanotechnology within the country. It revealed that it had requested the ratification of an agreement with the U.S.-based company, Lucent Bell Technologies, to support the program. The agreement included the use by Argentinean scientists of laboratories located in New Jersey.[26] Public reaction came quickly. The newspaper Pagina 12 published a set of articles depicting how some programs for scientific research in Argentina, and at least one in nanotechnology, were being financed

by the U.S. Department of Defense.[27] Immediately, the National Board of Ethics of Science and Technology issued a press release calling for the regulation of research, in particular any that is financed by foreign armed forces.[28] At the same time, within the parliament, the S&T Committee of the Chamber of Representatives was requesting reports related to the scientific research financed by the U.S. Department of Defense.[29]

Following the public controversy caused by this scandal in 2005, the seminar on multifunctional material organized in March 2006 by the U.S. Navy and the U.S. Air Force added more tension to an already delicate situation. Without delay, several newspaper articles made reference to this event.[30] The Managing Director of the Atomic Center at Bariloche questioned the seminar, which was attended by one of his most important researchers.[31]

The internal committee of the Union of Government Workers wrote a critical letter.[32] Furthermore, the Chamber of Deputies of the Nation requested reports and more detailed information.[33] The disputes reached the Executive of the Republic and thus the Manager Director of the Atomic Center at Bariloche quit his post.[34]

Conclusions

It is natural to think that technological revolutions are intended for the general progress of human society. This is not entirely correct, because technological revolutions almost always bring benefits to some more than others. The idea that, over the long term, improvements to living conditions will reach everyone is still prevalent. The illusion about these *future benefits* were already the object of criticism by the environmentalists, they put the process of industrialization in the docket, illustrating that what could bring benefits in the short term could also bring evils in the long term.

We are on the cusp of a new technological revolution; according to some, it will be the most rapid and most profound of all to date: the revolution in nanotechnology. Although it is somewhat early to evaluate its possible benefits, if we pay attention to the orientation of such technology we can anticipate some important differences from the preceding technological revolutions that occurred throughout the history of humankind. The Neolithic Revolution oriented itself to the improvement of food production. The Industrial Revolution, with a wider impact, guaranteed an important increase in first, the clothing industry, but later on in the production of daily supplies and on the means of production. The transportation revolution that took place at the end of the 19th century had a clear impact on the circulation of merchandise and people. But it is the peculiarity of nanotechnology development that it is being pursued with a very high attachment to military investments. U.S. public funds for nanotechnology research since 2000, when the National Nanotechnology Initiative was launched, fund between one third and one fourth of the budget of direct military investments. This, obviously, forces other countries to follow the same trajectory. This can contribute, perhaps, to the perpetuation of wars worldwide.

But to blame technology for human misfortunes is like giving life to it, which is illogical. The development of military technology is the result of the ongoing struggle to maintain economic hegemony and control over world politics, through direct violence. This is not a problem of technology; it is more the result of the imperialist character that some economies apply to S&T research. Scientists, many times, find themselves with the uncertainty that their research could or could not be directly financed by military institutions (often without their knowledge).

It is therefore important for the world and for Latin America to generate public debate about the orientation of S&T. The existence of ethical committees in charge of monitoring technology development and its financing become a necessity. The same applies to any research experimenting with human beings. Given the fact that in Latin America most of the research is still financed by public funds, it becomes paramount that S&T benefit the majority of the population. They should never be attached to military interests and/or commitments.

References

1 C4ISR = command, control, communication, computer, intelligence, surveillance, and reconnaissance.

2 Clifford Lau, *DoD Solid State Electronics Basic Research*, PowerPoint presentation, 2004; www7.nationalacademies.org/bpa/SSSC_MtgSpring2004_Lau.pdf.

3 Executive Office of the President of the United States, *The National Nanotechnology Initiative. Research and Development Leading to a Revolution in Technology and Industry,* Supplement to the President's 2006 Budget, 2005; www.nano.gov/NNI_06Budget.pdf.

4 Jürgen Altmann, *Military Nanotechnology: Potential Applications and Preventive Arms Control*, Routledge, Abingdon/New York, 2006.

5 An Argentinean researcher sponsored by the U.S. Office of Naval Research answered a question from a news reporter as follows: "I will never take part in research involving the development of military applications." Quoted by Andrea Ferrari, *Entrevista al organizador del encuentro – "definir nuestra política"*, Página 12, Buenos Aires, Marzo 18 2006; www.pagina12.com.ar/imprimir/diario/sociedad/subnotas/3-21238-2006-03-18.html.

6 Daniel Burrus and Roger Gittines, *Technotrends: How to use technology and go beyond your competition*, HarperBusiness, New York, NY, 1993.

7 National Materials Advisory Board, *Materials Research to Meet 21st Century Defense Needs*, The National Academies Press, Washington D.C, 2003.

8 http://en.wikipedia.org/wiki/Mansfield_Amendment.

9 United Nations Educational, Scientific and Cultural Organization (UNESCO), *The Ethics and Politics of Nanotechnology*, Paris, 2006, p. 4.

10 National Materials Advisory Board, op.cit.

11 U.S. Army International Technology Center-Atlantic), *Mission*, 2006; www.usaitca.army.mil.

12 Guillermo Foladori, *Nanotechnology in Latin America in the Crossroad*, Nanotechnology Law & Business Journal, Vol. 3, No. 2, 2006, pp. 205-216. Guillermo Foladoria and Édgar Zayago, *Tracking Nanotechnology in México*, Nanotechnology Law & Business Journal, Vol. 4, No. 2, 2007.

13 Office of Naval Research Global, *Regional Offices. Latin Americ. Forum*, 2004

14 CONICET = Consejo Nacional de Investigaciones Científicas y Técnicas; FONDEF-CONICYT = Fondo de Fomento al Desarrollo Científico y Tecnologico- Comisión Nacional de Investigación en Ciencia y Tecnología; CONACYT = Consejo Nacional ce Ciencia y Tecnología.

15 Panorama en Internet, *Armada norteamericana explora formas de colaboración con universitarios,* Universidad de Concepción; April 5, 2002; www2.udec.cl/panorama/p439/p13.htm.

16 U.S. Army International Technology Center (USAITC) Atlantic, *Worldwide USAITCs*; www.usaitca.army.mil/ww_usaitcs.html.

17 U.S. Army Research, Development and Engineering Command, *U.S. Army International Technology Center of the Americas Opens in Santiago,* RDECOM magazine, No 11/2004; www.rdecom.army.mil/rdemagazine/200411/part_ITC.html.

18 Office of Naval Research Global, Regional Offices. *Latin America*. Programs, 2004.

19 National Materials Advisory Board, op.cit., *Chapter 3.*

20 Air Force Office of Scientific Research, *AFOSR Research Interests for Latin America,* Dec. 21, 2005; www.prp.rei.unicamp.br/portal/mensagens/2005%20AFOSR%20Latin%20American%20Research%20Interests.pdf.

21 Air Force Office of Scientific Research, Mechanics of Multifunctional Materials & Microsystems; www.afosr.af.mil/ResearchAreas/research_aero_mechanics.htm.

22 *ONR* [Office of Naval Research] *International Workshop on Multifunctional Materials*, 2002;. www.phy.ohiou.edu/~isfmm/index2002. *ONR International Workshop on Multifunctional Materials II,* 2004; www.phy.ohiou.edu/~isfmm/index2004. *ONR International Workshop on Multifunctional Materials III,* 2006; www.phy.ohiou.edu/~isfmm; U.S. Embassy Chile, *Programs Supported in Latin America*; www.usembassy.cl/_temporal/597/ONR/Web%20Page/programs_supported_in_latin_amer.htm. Sergio Ulloa, *Final Participant List - Int'l. Workshop on Multifunctional Materials II, October 17-21, 2004, Huatulco, Mexico*; www.iiiv.cornell.edu/allwood/mexico2004/Roster.pdf.

23 Security and Prosperity Partnership of North America, *Report to the Leaders. Annex: Prosperity, June 27, 2005*; www.spp.gov/report_to_leaders/prosperity_annex.pdf?dName=report_to_leaders.

24 Guillermo Foladori and Édgar Zayago, op.cit.

25 United States Army South FSH-Texas, Conference of American Armies, *Specialized Conference on Science and Technology,* U.S. Army South, Newsletter 2(11), August 2006.

26 Ricardo Sarmetband, *Argentina invests US$10 million in nanotechnology* Science and Development Network, May 12, 2005; www.scidev.net/News/index.cfm?fuseaction=printarticle&itemid=2089&language=1.

27 Andrea Ferrari, *La batalla naval de los científicos argentinos* Página 12, September 25, 2005. Andrea Ferrari, *Comité de Ética para la ciencia argentina pagada por la US Navy*, Página 12, September 29, 2005. Andrea Ferrari, *Dime quién te financia...,* Página 12, November, 02, 2005.

28 Andrea Ferrari, *Dime quién te financia...,* op.cit.

29 *Puig-de-Stubrin, Storani, & Negri, Proyecto de Resolución. Fundación Argentina de la Nanotecnología. Creación.-Resolución del M.E. NS 380/05-. Objetivos de las políticas científicas. Pedido de informes al P. E. (Ciencia y Tecnología y Acción Social y Salud Pública)*; www1.hcdn.gov.ar/dependencias/ccytecnologia/proy/2.844-D.-05.htm.

30 Andrea Ferrari, *Las olas que produce la Armada norteamericanae*, Página 12, Buenos Aires, Marzo 18 2006. Andrea Ferrari, *Entrevista al organizador del encuentro – "definir nuestra política",* op.cit.

31 Ibid.

32 Asociación de Trabajadores del Estado, Junta interna del Centro Atómico Bariloche, *El Centro Atómico Bariloche y la U.S. Navy*, 2006; www.bariloche2000.com/article.php?story=20060313230747402&mode=print.

33 Honorable Cámara de Diputados de la Nación, *Informe No. 66,* Abril 2006; www.jgm.gov.ar/Paginas/InformeDiputado/Informe%2066/Informe%2066.pdf.

34 Renuncia y malestar en el Centro Atómico Bariloche. Se fue el gerente tras reunión entre militares de EE.UU. y científicos, Rio Negro online, March 23, 2006; www.rionegro.com.ar/arch200603/23/m23j77.php. *Anuncian nueva organización para la CNEA Se está haciendo la reingeniería de la institución. Granada admitió su malestar por la reunión reservada*, Rio Negro online, March 24, 2006; www.rionegro.com.ar/arch200603/24/r24j10.php.

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