Public Interest Report

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AN INTRODUCTION TO SMALL ARMS

Matthew Schroeder, Manager of the FAS Arms Sales Monitoring Project, explains the concerns that arise from illicit trade of pistols, assault rifles, light machine guns, and surface-to-air missiles. More than 600 million small arms and light weapons are in circulation around the world today. *More on page 4.*

UN REVIEW CONFERENCE ON SMALL ARMS

Dozens of governments met in New York City to talk about how to limit the trade of illegal small arms. Rachel Stohl of the Center for Defense Information explains what went wrong during the United Nations Small Arms Review Conference. *Read more on page 6.*

ART AND PEARL DELTA CHINA

Dr. Walter Parham works with Chinese researchers to develop effective, fast working methods to return degraded lands to productive agriculture. In the course of his restoration efforts for South China, he has made an interesting discovery comparing art with the geologic record. To learn more, *go to page 12.*

About FAS

The Federation of American Scientists (FAS), founded on 8 December, 1945 as the Federation of Atomic Scientists by Manhattan Project scientists, works to ensure that advances in science are used to build a secure, rewarding, environmentally sustainable future for all people by conducting research and advocacy on science public policy issues. Current weapons nonproliferation issues range from nuclear disarmament to biological and chemical weapons control to monitoring conventional arms sales and space policy. FAS also promotes learning technologies and limits on government secrecy. FAS is a tax-exempt, tax-deductible 501(c)3 organization.

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PRESIDENT'S MESSAGE

A Changed Environment for FAS

New leadership in Congress creates possibilities for a new policy agenda of intense interest to FAS. Much of our most important work over the past few years has been easy to characterize by what we were against: blocking dangerous developments in nuclear weapons, new constraints on government information, and cuts in research spending. We now have, with a fiscally restrained but politically more receptive Congress, the challenging task of helping construct positive solutions to fundamental problems. During the next few months we will seek the counsel of the FAS board, advisors, and members on where best to focus our efforts. I will take this opportunity to present some thoughts to start the conversation.

Economic changes over the last century resulted in a tightly coupled world economy. Economic change has increased living standards around the world, but the gap separating rich and poor is growing both among nations and within nations—including the US. This is shameful in itself but economic inequality, rather than conflicts over political ideology or religion, are likely to be the real engines of international turmoil for the foreseeable future. The danger is compounded because the free flow of information and goods has made it possible for countries with weak governments and non state terrorist groups to obtain terribly lethal powers — from access to sophisticated small arms, like shoulder-fired anti-aircraft missiles, to weapons of mass destruction including nuclear weapons. The fact that all nations live in the same atmosphere and biosphere has been underscored by frightening forecasts of the harm our accelerating industrial economy may have on our shared environment.

None of these challenges can be resolved without strong international collaboration or without coherent U.S. leadership. This begins by taking aggressive actions to get our own house in order. It's essential to restore America's reputation as a place that can encourage both creativity and justice, that celebrates freedom, growth, and change while taking care to ensure that everyone can benefit from progress, and that attention is paid to the environment and other non-market consequences of economic activity as a matter of routine.

These priorities assume that the U.S. must maintain strength and vigilance to defend ourselves. But this does not imply leadership by intimidation and pursuit of unfettered freedom of unilateral action that seems to have been the consensus view of the U.S. governing class for the past six years. It's a peculiar irony that the groups placing the greatest value on US unilateral freedom of action seem least concerned by the terrible constraints placed on US freedom of action by the need to maintain good relations with oil suppliers – few of whom share our values.

It is important that FAS seize this moment. Action on key issues in nonproliferation, energy, the environment, research, and education is badly overdue. The kinds of thoughtful, well researched concepts our community can offer have a uniquely receptive audience. It's time for us to move from defense to offense and develop concrete, actionable ideas that can be considered by a new Congress. I look forward to your thoughts about priorities and hope that you'll be willing to help us deliver. To start, I have outlined some specific priority areas in a table appearing later in this document. They are built around four themes:

1. **Enhancing the Nation's Security:** We must move beyond pork barrel projects left over from the Cold War and put our security resources where they matter the most. This includes making strategic investments in economic development, energy programs that could prevent conflict and setting an explicit goal of eliminating nuclear weapons.

2. **Improving the Natural Environment:** Technological advances increase productivity of resources use to a point where people worldwide can enjoy improved living standards and amenities with dramatically reduced environmental harm.
3. **PromoteInnovation and Discovery:** Innovation is the driving force of our economy; it is the only hope for continued US leadership in the global economy. This includes innovation in education. The freedom to explore the unknown is the ornament and obligation of an advanced society.
4. **Reform Government management of S&T:** Restore unbiased science and technology advice to the Congress and President and ensure that the actions of government and information available to government officials are accessible to voters except when restricted by clear, and challengeable, rules of classification.

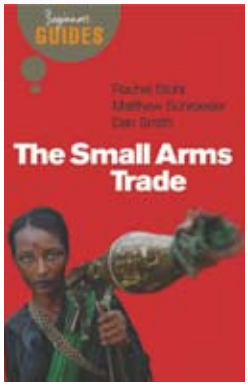
The US scientific community has an obligation both to help the new Congress define an agenda in these critical areas and build a national consensus for action. It's clear that none of the critical challenges facing the federal government can be resolved unless creative, dedicated people are willing to take the time to engage in the debate and encouraged to take key administrative positions in the federal government.

Hay Kelly

BOOK SUMMARY

THE SMALL ARMS TRADE

By Rachel Stohl, Matthew Schroeder and Dan Smith



The Small Arms Trade provides a gripping overview of the global impact of nearly 640 million small arms and light weapons – pistols, carbines, assault rifles, light machine guns and surface to air missiles – in circulation around the world. In the hands of irresponsible government armies, rebel groups, and terrorists, these weapons cause tremendous human suffering.

The wars that ravaged Central America and that continue in Afghanistan, Iraq, Liberia, the Sudan and dozens of other countries – wars in which millions of innocent men, women, and children have died and millions more have been deprived of economic opportunities — are fought primarily with small arms. Drug lords use them to eliminate competitors and assassinate government officials; abusive governments use them to suppress internal dissent and silence opposition; insurgents use them to kill soldiers on patrol; terrorists use them to elicit fear...the list goes on and on.

"Small arms are the true weapons of individual destruction," said Rachel Stohl, senior analyst at the World Security Institute's Center for Defense Information. "Controlling these deadly weapons requires national governments, regional organizations, and international institutions to work cooperatively. They must simultaneously control supply, take existing weapons out of circulation, end misuse, and address demand."

The "terrorist delight" – portable, guided missiles that have become a favorite weapon of terrorists and insurgents – are plentiful, easy to use, and extremely effective. Nearly a million missiles have been produced by over 20 countries, and thousands of those missiles are now outside of government control.

"Shoulder-fired missiles are a terrorist's dream and a law enforcement nightmare," said FAS analyst Matt Schroeder. "For less than the cost of a used car, a terrorist can cripple a commercial airliner, and with it the airline industry."

This guide reveals the disturbing reality behind the murky underworld of international arms trading. Full of insight and anticipating the danger of ever lighter and more powerful weapons, this is required reading for anyone who wishes to understand one of the key threats to development, prosperity and international peace in the world today.

MATT SCHROEDER is the Manager of the Arms Sales Monitoring Project at the Federation of American Scientists (FAS). Since joining FAS in February 2002, he has researched and written on U.S. arms transfers, arms export policies, and the illicit trade in small arms and light weapons.

RACHEL STOHL is Senior Analyst at the Center for Defense Information in Washington, DC, and is chairperson of the Small Arms Working Group.

COLONEL DAN SMITH retired from the U.S. army in 1992 and is currently Senior Fellow, Military and Peaceful Prevention Policy at the Friends Committee on National Legislation. Visit his blog at http://quakerscolonel.blogspot.com.

"The international trade in small arms has large consequences. This book goes a long way in clearing the ideological fog that so often clouds the analysis of a problem that urgently needs the kind of clearheaded, well informed analysis found in these pages." **Moisés Naim, Editor of *Foreign Policy* magazine and author of *Illicit: How Smugglers, Traffickers and copycats are hijacking the global economy***

"The Beginner's Guide is a tremendous resource for all those who wish to learn about the pandemic of smalls arms violence. Countless people each year are killed or left with debilitating injuries caused by these weapons in conflicts around the globe, conflicts fuelled by the small arms trade. For those who wish to help prevent this needless suffering, this book will provide invaluable insight." **Martin Butcher, Senior Advisory for policy and programs, Physicians for social responsibility**

FAS

Global Approach Needed

By Matthew Schroeder, Manager of the Arms Sales Monitoring Project at the Federation of American Scientists

Few security threats are more ubiquitous, intractable, and pernicious than the illicit proliferation and misuse of small arms and light weapons. They are the weapons of choice for most terrorists, criminals, and insurgents who use them to devastating effect against civilians and soldiers alike. The Geneva-based Small Arms Survey estimates that these weapons are responsible for roughly sixty to ninety percent of direct conflict deaths, which numbered between 80,000 and 108,000 in 2003 alone,[1] and tens of thousands of additional deaths outside of war zones. Some countries suffer disproportionately from this scourge. In war-torn Colombia, for example, small arms-related violence has claimed the lives of nearly a half million people since 1979.[2]

Even the fighting forces of the most powerful nations in the world are vulnerable to modern small arms. In Lebanon, the terrorist group Hezbollah shocked the world when it used laser-guided anti-tank weapons, assault rifles and other small arms to bring Israel's August ground offensive to a grinding halt – a feat unmatched by the armies of the Arab world. Similarly, coalition forces in Iraq and Afghanistan – the best armed and best trained soldiers in the world – regularly suffer casualties at the hands of insurgents armed only with small arms, light weapons, and improvised explosive devices.

The sources, methods, and routes through which Hezbollah and other bad actors acquire small arms and light weapons are remarkably diverse. At one end of the spectrum are the massive, sanctions-busting arms shipments organized by international traffickers like the infamous Victor Bout. Bout and his competitors acquire large quantities of military weapons from corrupt or negligent governments and deliver them to war zones and embargoed regimes through a complex and fluid network of front companies.

While Bout's shipments grab headlines, most illicit weapons are acquired in less dramatic fashion. Some are illegally purchased or stolen from private owners or pilfered, a few at a time, from poorly secured police and military arsenals. Others are seized by guerrillas from government forces or peace-keepers, or looted from overrun army garrisons. Craft production – small scale, clandestine production of firearms by unlicensed gunsmiths – is another source of illicit weapons.

Reining in this deadly scourge requires sustained, simultaneous, and coordinated action on many different fronts. No panacea and no single country, regardless of the influence it wields or resources at its disposal, can tackle this problem alone. What is needed is a systematic, multifaceted global approach aimed at:

- recovering illicit weapons already in circulation through buyback programs and demobilization, disarmament and reintegration programs;
- preventing the theft, loss and diversion of additional weapons by controlling exports, securing stockpiles, and destroying surplus weapons;
- disrupting or dismantling arms trafficking networks through undercover "sting" operations and tracing seized weapons to their sources; and
- addressing the root causes of the conditions that create demand for illicit weaponry.

While individual governments have been battling small arms traffickers for decades, it wasn't until the mid-1990s that the international community took up the issue. In 1995, the UN General Assembly passed a resolution calling for a group of government experts to study the nature, causes, and means of addressing the small arms threat. The group's report fleshed out the problem of "excessive and destabilizing" accumulation of, and illicit trafficking in, small arms and light weapons, and called for inter alia, the convening of an international conference on the illicit arms trade. That Conference, held in 2001 in New York, drew worldwide attention to the problem and provided a road map for addressing it in the form of a *Programme of Action to Prevent, Combat and Eradicate the Illicit Trade in Small Arms and Light Weapons in All its Aspects.*

Since then there has been a flurry of national, regional, and international initiatives aimed at addressing all aspects of the small arms threat. These initiatives vary significantly in rigor and scope, but all contribute – however minimally – to the nascent, global campaign to rein in the illicit trade and misuse of small arms.

Have they made a difference? The absence of good data precludes a definitive answer to this question. At best, existing data provides a

[1] Small Arms Survey 2005.

[2] Small Arms Survey 2006.

to Stem the Trade of Illicit Small Arms

snapshot of trafficking activity in a given country or region at a given time. Another, albeit less telling, indicator of progress is the implementation of control strategies, including those laid out in the UN *Programme of Action.* A study on *Programme* implementation done by International Alert, Saferworld, and the University of Bradford in 2006 reveals progress in some areas and regrettable inaction in others. An example of relatively significant progress is in the designation of national points of contact on small arms issues, which facilitates inter-governmental cooperation and information-sharing. As of May 2006, 150 countries had designated national points of contact, up from 111 three years earlier. Similarly, great strides have been made in curbing the threat from particularly dangerous weapons, such as man-portable air defense systems. Since 2001, US-led efforts have yielded agreements on MANPADS controls in five international fora and the destruction of at least 21,000 surplus and poorly secured missiles.

Progress in other areas has been woefully inadequate. Many states lack even the most basic of safeguards, such as systematic stockpile management and brokering laws. According to the 2006 study, only about 102 countries have "standards and procedures for the management and security of stockpiles" and only 37 countries have "specific controls over SALW brokering activities." While a lack of political will explains many of these failings, resource limitations also play a role. Systematically monitoring imports and exports and securing borders requires infrastructure, personnel and equipment, funding for which is often in short supply in developing countries. FAS

United Nations

Secretary-General Kofi Annan (left) at the opening session of the UN Small Arms Review Conference, which ran from 26 June until 7 July at UN Headquarters in New York. Also present was Nobuaki Tanaka, Under-Secretary-General for Disarmament Affairs.
26 June, 2006, United Nations, New York.

In 2001, the United Nations held a landmark conference on small arms. The UN had only begun working on the small arms issue six years prior, spurred on by the 1995 publication of *Supplement to An Agenda for Peace.* Authored by former UN Secretary-General Boutros Boutros-Ghali, the *Supplement* introduced the concept of "micro-disarmament" – controlling the millions of small arms and light weapons which Boutros-Ghali identified as the weapons "that are actually killing people in the hundreds of thousands."

In 1996, following the publication of the *Supplement,* a UN Panel of Governmental Experts began to develop an action plan on small arms which eventually led to the 2001 UN small arms conference.

The 2001 UN Conference on the Illicit Trade of Small Arms and Light Weapons in All its Aspects produced a Program of Action (PoA) – a voluntary, politically-binding agreement that outlines state practices and priorities at the national, regional, and global levels for combating the uncontrolled proliferation of small arms and light weapons. In 2003 and 2005, UN Member States reconvened at the Biennial Meetings of States (BMS) to report their progress on implementing the PoA.

Last summer the states met yet again at a review conference to evaluate global implementation of the PoA, as well as to clarify and elaborate on existing commitments within that agreement. However, the conference held in New York from June 26 through July 7 ended in complete failure.

The conference gave states an opportunity to outline their priorities for small arms action and their views on the UN small arms process through formal speeches. States also worked to negotiate an outcome document that would enunciate next steps for the United Nations on small arms. Over the course of two weeks, delegates met in a constant succession of formal and informal sessions, often working through the night to find common ground. However, as the conference reached its final hours, it became clear that negotiations were going nowhere. No agreement could be reached and no outcome document was adopted. In the end, no single factor or state caused the conference to fail. Indeed, the meeting was a perfect storm of domestic and international politics, and a flawed process which joined forces to leave the conference in deadlock.

So what went wrong? The conference's failure can be blamed on both process and substance. First, the conference was held under the auspices of the United Nations, which prefers consensus based processes. The countries that opposed a particular issue were able to entirely block discussions on those topics instead of coming to a vote, which caused many issues to remain unresolved. Second, because all countries were allowed to present their views in formal sessions, the conference ran out of time to complete difficult negotiations. Third, the resolution of controversial issues was held up by states who quibbled over insignificant issues or nitpicked word choices in the text of the outcome document to put on a showcase of their political posturing skills for domestic constituencies and interests. For example, the United States objected to any reference of illicit possession of weapons, even though U.S. law already contains such provisions, because the National Rifle Association strongly opposed any potential inferences to civilian possession of any kind.

From a substantive point of view, very few issues were controversial, but the procedural flaws allowed a few issues and a few states to hold the entire conference hostage.

Issues that sparked controversy at the conference were: the inclusion of language in the final document that linked small arms proliferation to development (opposed most strenuously by the United States and Indonesia); language that encouraged states to adopt national regulations against illicit trade, possession, and manufacture (opposed by the United States); language that stated the need for enhanced and enunciated transfer controls, including global principles for arms transfers (initially opposed by Iran, Cuba, and Pakistan, which permitted China and India to remain silent in their opposition; later opposed by the United States after a United Kingdom-brokered compromise gained the support of states who initially opposed); and concrete follow-up mechanisms (the United States was unwilling to consider future UN meetings). The inability of states to agree on these issues virtually paralyzed the proceedings and removed any hope that a compromise agreement could be reached.

Although the Review Conference did not

Action on Small Arms: Moving Forward from Failure

By Rachel Stohl, Senior Analyst, Center for Defense Information

result in a specific strategy for combating small arms at the global level, the United Nations will remain strongly engaged on the small arms issue. The PoA remains a useful framework for coordinated small arms work, and other UN small arms initiatives are already in the works. The October 2006 session of the First Committee – the UN Committee that develops resolutions on disarmament issues for the UN General Assembly – was an important venue for the further development of UN small arms efforts. Among the several resolutions subsequently adopted by the General Assembly on small arms was one that included a call for the next Biennial Meeting of States to be held no later than 2008. In addition, the General Assembly adopted a resolution that begins the process for an international arms trade treaty that would develop common international standards on the import, export, and transfer of conventional arms. By a vote of 153-1 – the United States was the only country to vote against the resolution – the General Assembly agreed to an exchange of views on the arms trade treaty and to convene an experts group to assess the feasibility and possible parameters of an arms trade treaty.

Processes already begun by the PoA are also continuing. In November 2006, a UN Group of Governmental Experts (GGE) on brokering began their study of enhancing international cooperation on brokering controls, which will likely result in a future international instrument on arms brokering. States also met to review the implementation of the PoA mandated marking and tracing instrument in early 2007. These groups will continue to meet on a regular schedule in order to reach agreement on a way forward.

The failure of the UN Review Conference is appalling and regrettable. However, the majority of states and civil society groups worldwide remain committed to stopping this deadly scourge. The United Nations will remain a key player in the efforts to reign in the uncontrolled trade of small arms. And states are developing new UN initiatives that cannot be sidelined by the procedural and political issues that doomed the Review Conference to failure. The next five years will likely see significant results. **FAS**

Secretary-General Kofi Annan (at podium) speaking at the opening session of the UN Small Arms Review Conference, which ran from 26 June until 7 July at UN Headquarters in New York. He said that every year an estimated $1 billion worth of small arms are traded illicitly worldwide, exacerbating conflict, sparking refugee flows, undermining the rule of law and spawning a "culture of violence and impunity."
26 June, 2006, United Nations, New York

A Recurrent Latin American Nightmare:

By Pablo Dreyfus, Research Coordinator, Small Arms Control Project, Viva Rio, Brazil

This article represents the personal views of its author.

Widespread corruption, organized crime and weak states are conditions that facilitate and provoke the diversion of small arms and ammunition from military and police stockpiles to criminal organizations and illegal armed groups. The situation is particularly serious when these arms and ammunition feed armed conflicts. For instance, several academic works and policy papers provide examples of leaks of small arms from military and other state agencies to armed groups involved in the internal armed conflict in Colombia. These analyses suggest the diversion from Ecuadorian, Peruvian, Brazilian and Venezuelan official stockpiles to armed groups such as the *Fuerzas Armadas Revolucionarias de Colombia* (FARC) and the *Ejército de Liberación Nacional* (ELN).[1]

In the case of Venezuela this is particularly worrisome. The government recently purchased 100,000 AK-103 7.62×39mm caliber assault rifles from Russia to replace the aged FAL rifles purchased from Belgium in the late 1950s and manufactured in the 1970s by CAVIM (*Compañía Anónima de Industrias Militares*), the state managed arms company.[2] The contract between CAVIM and the Russian company Rosobornexport also includes the purchase of ammunition and the transfer of machinery and technology to produce assault rifles and 7.62×39mm rounds.[3]

The AK-103 is a newer version of the AK-47, a favored weapon of the FARC, the strongest guerrilla group in Colombia.[4] Analysts and policy makers argue over the possible Venezuelan threat. One group believes the quantity of assault rifles purchased is exaggerated and non-utilized rifles might be diverted to Colombia. Another group argues the real problem is the possible diversion of surplus old FAL rifles that will result from the incorporation of the new Russian weapons. A third possibility is the diversion of 7.62×39mm ammunition to FARC, who is having serious problems getting ammunition for its AK-47 rifles.

The first two arguments are not entirely justified and should not be the main source of concern. The real problem is the potential to fuel the Colombian conflict with the sudden availability of 7.62×39mm ammunition diverted from official Venezuelan stockpiles. There are practical solutions that, if implemented by CAVIM, would help prevent the diversion of ammunition to illicit markets.

U.S concerns: *100,000 assault rifles is an exaggerated and destabilizing amount.*

The United States argues that the quantity of assault rifles purchased by the government of Venezuela is exaggeratedly high and may cause a regional destabilization.[5] The 100,000 rifles, however, is not a new figure. According to the Plan of Strategic Consolidation of the Venezuela Armed Forces 1998–2007, formulated in the late 1990s by the Directorate of Armament of the Armed Forces (DARFA), Venezuela should replace its FAL rifles with 100,000 new rifles in a gradual process that would take up to 10 years.[6]

What is surprising is that DARFA recommended the purchase of a 5.56×45mm weapon that would become the "assault rifle for the 21st century of the Venezuelan armed forces." DARFA had already tested several 5.56×45 mm candidates for the replacement of the FAL rifles like the Kalashnikov AKM-200 (Russia); Colt M-16A2 (United States); FN FNC (Belgium); Steyr AUG (Austria); FAMAS (France); SIG 550/551(Switzerland); Vecktor (South Africa); Heckler und Koch G36E (Germany); and Galil (Israel). And since 2001, CAVIM had started producing 5.56×45mm ammunition to supply the new rifles.[7]

Then there was a sudden doctrine change in favor of a 7.62×39mm rifle. This could be interpreted as a political statement by President Chavez who "bought whatever weapon I want and where I want."

The 100,000 assault rifles would not far exceed the needs of the Venezuelan military.

[1] Small Arms Survey, 2006, Oxford, Oxford University Press, p.222; García-Peña, Daniel, War Peace and Light Weapons in Colombia: A Case Study, Geneva, Geneva Forum, 2006, p.83; Schroeder, Matt, *Small Arms, Terrorism and the OAS Firearms Convention,* Washington D.C., FAS, Occasional Paper Nº1, pp. 22, 23 and 24.

[2] Small Arms Survey 2006, p.87

[3] Ibid.p.87

[4] Ibid, p. 220-227; Fundación Ideas Para la Paz, *Siguiendo el Conflicto: hechos y análisis de la semana.,* Nº 6, 2005, p.2; Pézard, Stéphanie, Sustaining the Conflict: Ammunition for Attack, in Pézard, Stéphanie and Anders, Holger, *Targeting Ammunition: A Primer, Geneva,* Small Arms Survey, 2006, p.144

[5] See for example: Lumpkin, Jhon, Rumsfeld attackts Venezuela on AK-47s, The Globe and Mail, March 24, 2005, http://www.mre.gov.br/portugues/noticiario/internacional/selecao_detalhe.asp?ID_RESENHA=119581&Imprime=on and BBC News, US Concern over Venezuela Rifles, http://news.bbc.co.uk/2/hi/americas/4377481.stm

[6] "El fusil de asalto del siglo XXI", La DARFA en la actualidad, http:www.fav-club.com/articulos/darfa4.htm;Centro de Estudios Unión para Nueva Mayoría, Balance Militar de América del Sur, País: Venezuela, adquisición de material bélico, 2005, p.2; Fundación Ideas para la Paz, Siguiendo el Conflicto: hechos y análisis de la semana, Nº 6, 2005, p2.

[7] El fusil de asalto del siglo XXI", La DARFA en la actualidad; Fundación Ideas para la Paz, p2.

Its armed services, including the militarized police — National Guard — which is considered a fourth armed force, is 91,000 troops strong without the first line of reserves (estimated at 8,000 troops).[8] There would be few guns left to be diverted to the FARC.

The old FAL may get diverted to armed groups in Colombia

In the late 1950s and early 1960s Venezuela purchased 50,000 FAL 7.62×51mm assault rifles from FN Herstal (Belgium). Approximately 10,000 FAL rifles were assembled in the 1970s by CAVIM.[9] These 60,000 rifles will become surplus after the purchase of the Kalashnikovs. According to DARFA, 50 percent of the surplus will be kept for the reserves with the rest to be used for spare parts.[10] This surplus may in fact be diverted to insurgent groups in Colombia, particularly the FARC. As a matter of fact, military, law enforcement and intelligence sources in Colombia have reported the diversion of FAL rifles belonging to Venezuelan armed and security forces since the mid 1990s.[11]

However, it would be a strategic mistake for the FARC to incorporate FAL 7.62×51mm caliber rifles into its stockpile.[12] There is a steady shift in the region from 7.62×51mm to 5.56×45mm caliber weapons. For example, Colombia, Ecuador, and Peru use 5.56mm weapons. Brazil is also changing its caliber. Relying on FAL rifles would imply a shortage of ammunition in the near future. If, on the other hand, the FARC keeps the Kalashnikovs as its main assault weapon, an ammunition factory is located next door…in Venezuela. This fact leads to the third considered risk of the recent arms deals between Venezuela and Russia: the diversion of ammunition.

New wine in old bottles: *the risk of feeding FARC rifles with ammunition produced in Venezuela.*

The FARC is experiencing problems procuring ammunition for its AK-47 rifles with the resolution to Central American conflicts and the end of the paramilitary's control of the Gulf of Urabá (the main sea corridor used for arms and ammunition trafficking). This caliber is scarce in South America since the militaries in the region do not use this kind of ammunition.[13] The only exception is Venezuela which will soon begin massive production of the ammunition desperately needed by the FARC. There is a clear and present threat of corruption and the diversion of Venezuelan ammunition to the FARC and also to paramilitary groups.

Unlike weapons, small arms ammunition rounds are not marked with serial numbers. Though it is possible to determine the manufacturer and, sometimes, the year of production, it is virtually impossible to trace ammunition to its first purchaser or receiver.

This problem is not unsolvable. For example, Colombia and Brazil adopted measures to engrave lot numbers in the ammunition produced for the military and the security forces to facilitate investigations concerning the diversion of ammunition from state stockpiles. The alphanumerical characters are durable, easily visible and readable, and remain intact even after the round is fired. Lot numbers on the ammunition are unique to the production run for the order and transferred only to the client who ordered the ammunition. Each lot number can be linked to a specific transfer and to the state who ordered the lot.[14] This practice is further eased when, as in Venezuela, there is a single national producer and supplier for the armed forces.

Ammunition marking is not the panacea for the prevention of diversion and theft from official stockpiles. However, lot marking is a step forward to identify the specific source of diversion and end the vicious circles of impunity that favours corrupt practices or enable security breaches. Because it facilitates more accurate tracing, lot marking is a powerful tool in terms of international cooperation against illicit arms trafficking and also in terms of adequate control and administration of military and police stockpiles. The adoption of ammunition marking measures would certainly benefit Venezuela in terms of its international image and for the region as a whole in terms of security and stability. **FAS**

[8] Centro de Estudios Unión para la Nueva Mayoría, *Balance militar de América del Sur* / - 1ª. ed. – *Buenos Aires: Centro de Estudios Unión para la Nueva Mayoría,* 2004.pp. 112 and 324 and The Military Balance 2005–2006 (for the reserves figure)

[9] Altuve Febres, Fernán, La Historia del FAL de la Fabrique Nationale, Seguridad al Día.com and Klare, Michael and Anderson, David, *A Scourge of Guns: The Diffusion of Small Arms and Light Weapons in Latin America,* Washington D.C, Federation of American Scientists, 1996, pp.22 and 127 and República Argentina, Ministerio de Defensa, Registro Nacional de Armas, Fabricas de Explosivos, Armas y Municiones en América Latina: una visión actual sobre los principales establecimientos estatales de producción para la Defensa. http://www.renar.gov.ar/cursos/expertos/notaa/fabricas.asp

[10] La Darfa en la Actualidad

[11] García-Peña, Daniel, op.cit., p.83; Schroeder, op. cit., pp. 22, 23 and 24

[12] Dreyfus, Pablo, "Small Arms: a lethal fashion", IANSA Newsletter, Latin America, 2003, http://www.iser.org.br/publique/media/LETHAL%20FASHION.pdf

[13] Pézard, op.cit. p. 144 and Small Arms Survey 2006, pp. 220-227

[14] Anders, Holger, "Refutando mitos sobre la imposibilidad de marcaje y rastreo de munición", En la mira, Nº 0, 2006 http://www.comunidadesegura.org/?q=pt/taxonomy_menu/15/156; Aguirre, Catherine and Restrepo, Jorge, Marcaje y Rastreo de Munición: Indumil en Colombia, En la Mira, Nº0, 2006, http://www.comunidadesegura.org/?q=pt/taxonomy_menu/15/156; Anders, Holger, "Following the Lethal Trail: Identifying Sources of Illicit Ammunition", in Holger and Pézard, op.cit.pp.207-228 and Dreyfus, Pablo, "Crime and Ammunition Procurement: the case of Brazil", in Holger and P

Where Have All the Antonovs Gone?

By James Bevan,
Small Arms Survey

What characterises the small arms trade in Africa? For many it is the image of Antonov transport planes depositing their cargoes in failed states such as Liberia and Angola. The general view of this illicit trade is one of a complex network of corrupt officials, unscrupulous arms merchants, international brokers, and transport agents — all conspiring to supply the dictators and warlords of the continent.

This image informed the emerging small arms control movement that began to take shape during the epidemic of African conflicts in the 1990s. Since then, the bulk of international attention has focused on major international illicit trade. Such large-scale illicit shipments to Africa continue to this day, but they have subsided, just as many of the wars that attracted them have dissipated. These major arms and ammunition shipments were and are a symptom of Africa's full-scale conflicts, but they are not the only cause of the simmering potential for war in many African states.

The wars that ushered in the ubiquity of the Kalashnikov have, in many states, subsided into a post-conflict disquiet—an uneasiness that cannot truly be described as peace. Violence characterises these settings, although rarely is it organised or intense enough to attract large-scale, illicit arms shipments. But arms are still entering the equation and in large numbers. The "Antonov phenomenon", with its emphasis on bulk transfer, masks an uncounted number of low-volume transfers that, every year, contribute to the destabilization of communities, the frailty of states, and the escalation of grievances into full-blown civil conflict.

This short essay focuses on the role played by low-level small arms proliferation in fuelling the demand for arms — a self-sustaining dynamic that links local insecurity, the illicit trade in small arms and the legal state-to-state trade in weaponry. In particular it highlights the illegal flow of weapons from state armed forces to non-state actors in the region.

The trade in question has been called the "ant trade" — a slow, piece-by-piece movement of small arms across the continent. But this term implies something localized, something unimpressive in scale and with few links to the international arms trade. To view it as such is a mistake and one that is often made. To consider it peripheral to the "real" illicit trade is to denigrate its effect on security, its impact on development, and on the socio-political trajectory of the continent as a whole.

Where does this trade originate? It is partly a product of the vast accumulation of arms during Africa's shattering Cold War conflicts — a symptom of societies that have become militarized and armed to the point of saturation, but it is more than that.

Africa's illicit stocks of small arms are being fed, continually, by a burgeoning trade in newly-manufactured arms and ammunition. These weapons are produced by some of the largest supplier states in the legal arms trade.

The new arms circulate widely among post-conflict societies. They propagate among communities that have escaped full-scale conflict, but seek to defend themselves from more general threats. They proliferate also among criminals — the "spoilers" to peace, whose predatory activities hold many communities in a permanent state of insecurity.

These weapons are not shipped into countries by internationally-savvy illicit arms dealers. More often than not, they are lost from the military arsenals of African states through a trinity of factors — poor government policy, poverty and insecurity.

Throughout the continent, ethnic rivalry, the encroachment of nomadic peoples, or the threat from high levels of criminality, prompt governments to distribute arms, create armed

militia groups, and deploy troops. In this muscular and often uncoordinated approach to security, state armed forces often prove to be the interface between the legal and illicit arms markets — exacerbating small arms proliferation and violence in the region.

A powerful mix of poverty and insecurity is at the root of this flow of arms. Soldiers and government militias are paid erratically and poorly. Minimal oversight makes arms and ammunition an attractive currency in the absence of a regular income. Many communities suffer violence and insecurity, often at the hands of state-supported "security providers", but communities seeking security also trade goods for arms with these forces; perpetuating insecurity in their communities and further increasing the demand for small arms.

The flow of illicit arms and ammunition is commensurate with the degree to which governments distribute arms, form militias, or deploy troops for civilian duties. It is not uncommon to find military ammunition, produced as recently as 2004, in the hands of communities living far from central government. In the African context, this ammunition is new. Within only two years, it has been legally transferred from a manufacturer to a state party, sold by state armed forces deployed in a distant locality, and become fuel for another of Africa's inter-communal conflicts.

Today's illicit trade is facilitated by the near monopoly of Kalashnikov-pattern weapons in Africa. Such a monopoly ensures interoperability of parts, and most importantly ammunition. The result is that weapons and ammunition can be traded between virtually any armed actor on the continent, irrespective of whether he or she is a member of the army, a rebel, or a criminal. Wherever state armed forces are deployed or militias created, their weapons and ammunition are indistinguishable from those in the hands of civilians.

Small, personally-motivated trades of illicit arms and ammunition will never appear as dramatic as an Antonov shipment, but they occur tens of thousands of times each year. Every round of ammunition or weapon supplied has the potential to spark or escalate armed violence.

It is not uncommon for rebellions and large-scale insurgencies to have been started by groups with only five or ten assault rifles to their name. These are the groups that, if unchecked and unhindered in their access to arms, can eventually become the recipients of the kinds of large-scale illicit shipments that characterised the wars of the 1990s.

Few of these weapons are produced in Africa. They are manufactured by the foreign powers that supply African governments. These powers do so legally, never contravening an arms embargo and never breaking with international convention.

China, for instance, has become the predominant supplier of small arms and ammunition to a number of countries in East Africa. China's trade is legal. But Chinese arms and ammunition appears in illicit markets almost immediately after transfer to a state party in the region. The question of whether supplier states are exercising due diligence is an obvious one— supplying arms to some of Africa's states is analogous to pouring water into a sieve.

State-sanctioned arms transfers to countries in Africa are fuelling the continent's insecurity and impeding its development. Governments in the region recognize this, but point fingers at their neighbours, at porous borders, and at the global north for producing these arms. Their focus is squarely on the international illicit trade in small arms. Rarely do they concede that much of the problem stems from their own security forces selling arms and ammunition.

States complain that sealing state borders is an insurmountable problem, given the paucity of funds available to most governments in the region. But cheaper remedies may be far more effective. Policies of creating militia units or distributing arms in society can be reversed and, given minimal investment and political will, improving oversight and accountability over state small arms stocks is an attainable goal.

In some ways, the international movement to control small arms has overlooked the extent of small arms loss from state forces. Researchers and policy makers perpetuate a false dichotomy by discriminating between the legal and illicit markets. A focus on the latter draws attention away from the near seamless convergence of the two markets in Africa.

The Antonov phenomenon is not dead; it has subsided sufficiently to draw attention to the underlying sources of small arms in the region. The loss of small arms from state stocks may not yet have the media profile to grab significant international attention. It nevertheless facilitates predation, allows crime to flourish, and undermines the confidence of communities recovering from armed conflict. These factors conspire to create a strong demand for small arms — a self sustaining dynamic that keeps much of Africa simmering just below boiling point.

Art and the Pearl River Delta Environment

By Walter Parham, PhD., Director, China Tropical Lands Research, Federation of American Scientists

History tells us that South China and the Pearl River Delta region (Fig. 1) in particular began to suffer environmental damage about 1,000 years ago when large numbers of people migrated from north to south. (Marks, 1998; Parham *et al.*, 1993). The forest vegetation was removed for a variety of reasons: to provide firewood, building materials, and to make charcoal; to clear land for farming and settlements; and to provide safety from fire, wild animals, snakes, and bandits. Much of the land in the Pearl River Delta region is still in a damaged and degraded state.

Western and Chinese artists who frequented the Pearl River Delta region recorded the damage in paintings and drawings. In addition, land and vegetation damage is shown in some early photographs taken in China.

Until about 1750, Chinese art lacked perspective. The local Chinese artists learned to draw using the perspective technique from foreign artists and then began to incorporate the technique in their works. Even though the Western and Chinese artists probably were not trained in geology/geomorphology, they demonstrated keen observations in their artworks related to the nature of the land surface. The Western and Chinese artists show that the land was largely deforested and badly eroded 200 years ago. Historical art depicting the Pearl River Delta region can be used in geological and geomorphological applications, such as to determine the type of local bedrock, determine the intensity of rock weathering, and to assess the status of soil erosion.

Much of the artwork produced by artists 150-200 years ago shows an accurately represented Chinese landscape, with geological information that matches current geological knowledge, and land and wildlife habitats that were already severely damaged in the 1700s and 1800s.

Considerable agreement exists among historical artworks produced by different artists over 200 years as to the condition of the environment of the Pearl River Delta region. It is unlikely that there were extensive, undamaged wildlife habitats that remained in this region at this time. Using art to determine the condition of the land and vegetation in the Pearl River Delta region 200 years ago may provide some difficulties. However, it may be even more difficult to foretell what the land condition of the Pearl River Delta region will be in 15 to 20 years as the region's development and economy race ahead.

Figure 1: Map of the Pearl River Delta Region

Introduction:

As agriculture expanded, the loss of vegetation caused destruction of wildlife habitats for large animals.

Elephants disappeared from the region in about 1400 primarily because of forest destruction (Marks, 1998; Elvin, 2004). Tigers persisted until the early 19th century when their forest habitat became highly fragmented (Marks, 1998) and their number has continued to decline since then.

The region is composed largely of granite and volcanic rock; chemical weathering reaches depths of 60 to 80 meters; soil fertility is poor; and fires and landslides are common. Once deforested, the land eroded easily.

Much of the land in the Pearl River Delta region is still in a damaged and degraded state. It is likely that much of the land's appearance is a result of past damaging land-use practices. Biological and physical scientists who study this region recognize clues that support the story of past widespread damage to the land, vegetation, and wildlife. Nevertheless, we can only imagine how the appearance of the land changed as human activities altered the land and its vegetation. It is evident from recent studies (Parham *et al.*, 1993) that land abuse continued to have additional adverse affects over the last 50 years. World War II, China's Great Leap Forward and its Cultural Revolution, coupled with the region's booming economic development, certainly are recognized as contributing factors to further environmental damage.

Figure 2: The moist, tropical, broad-leaf forest at Dinghushan is at least 400 years old, and once provided habitat for the South China Tiger (Photo by W. Parham, 2003)

Western and Chinese artists who frequented the Pearl River Delta region have recorded the damage in numerous paintings and drawings. These works of art are one way to look back into the past to examine how the landscape appeared some 200 years ago. Other researchers have tried similar techniques to link art and the environment. For example, one researcher, who was interested in whether or not cloud cover increased during the Little Ice Age during 1450 to 1850, examined thousands of artworks in European and American museums that were painted during that period (Fagan, 2000). He recorded the type and amount of cloud cover in each painting and showed statistically that cloud cover was significantly more common over Europe during the Little Ice Age.

Environmental damage is also documented in some of the earliest photographs taken in China. These only date back to 1844; a few daguerreotype photographs of Hong Kong (Hacker, 1997) show some environmental damage in the 1860s. Many early photographs were taken in the Treaty Ports and not the countryside.

Background:

While visiting Hong Kong art museums, I noticed some interesting paintings of the Pearl River Delta region. Many showed that the artists paid careful attention to land-form detail. It seemed possible to extend our visual knowledge of the Delta region's land surface back in time using these early artworks.

Some of the first European artists who visited the Pearl River Delta on trading ships and naval vessels sketched and painted the local landscapes. These artists, in the process, passed some of their skills on to local Chinese artists. Until about 1750, Chinese art lacked perspective, a technique of geometry that local artists learned from foreign artists and began to incorporate in their works (Sargent, and Palmer, 1966). Interestingly, Elvin (2004) notes that Chinese maps also improved their precision by 1850. The blending of Chinese art techniques with those from the West developed into Asian Export Art, an important new business activity at the time (Sargent, and Palmer, 1996).

Figure 3: Deforested land, and landslides near the mouth of the Pearl River in 1793 (with permission of Cornell University Library, Wason Collection of East Asia)

I examined a large part of the 1,200 image historical collection of the Hong Kong Museum of Art (HKMA) available to the public on the Internet. Some of these works are referenced in this article. In addition, I searched the literature for collections of relevant old photographs from Hong Kong and South China.

Environmental assessment of historical art:

Past condition of the land and wildlife habitats

Dinghushan (Fig. 2) is a Man and the Biosphere Reserve situated 86 km west of Guangzhou (Kong et al., 1993).

This 900 hectare remnant of original tropical evergreen, broad-leaf forest is at least 400 years old and is all that remains today of a forest that originally covered much of Guangdong Province and adjacent areas. The forest was the home of the elephant until 1400, and the South China tiger, until the early 19th century. Compare the photo of Dinghushan to a sketch of South China's Pearl River Delta region of about 200 years ago. The sketch (Fig. 3) by an *HMS Lion crew* member shows that grasslands prevailed, forest cover had been destroyed along the east side of the Pearl River near its mouth, and that landslides (see small arrows) were clearly evident.

Lan Tau Island (Fig. 5), situated about 20 km further south, exhibits an absence of its original forest. Fires commonly sweep across such grasslands in the fall requiring as much as five to ten years for the vegetation to grow back to its pre-fire condition. These fires, caused by man, continue to threaten wildlife habitats in the region today.

Figure 4 is a painting of the north side of Hong Kong Island, probably painted by an anonymous Chinese artist. It shows a deeply eroded mountainside and a general lack of forest cover.

Figure 4: Deeply eroded Hong Kong Island, 1855-60 (Hong Kong Museum of Art Collection)

Opposite Hong Kong Island on the mainland, John Collins' painting shows Kowloon, where Fort Victoria once existed. The land is barren and treeless (Fig. 6).

Closer views of the region's land show severe damage. For example, William Lodder shows that tombs (Fig. 7) dug by hand into Hong Kong's weathered, granite hillsides are

Figure 5: Lan Tau Island, Hong Kong, once forested, is now covered with grasslands (Photo by W. Parham, 1967)

surrounded by a scalped or denuded landscape with vegetation consisting of no more than a few bushes hidden in small depressions. Such sites composed of weathered granite are subject to severe erosion during the rainy season, and it is difficult for vegetation to reestablish itself.

Geology and geomorphology

Historical art depicting the Pearl River Delta region provides several geological and geomorphological applications such as in determining the type of local bedrock, intensity of rock weathering, and the status of soil erosion. Certain land forms, such as *inselbergs,* core stones, and *beng-gang* erosion, can be identified readily from the art. These features help to identify the composition of the underlying bedrock geology and pre-date the first rudimentary geological description of Hong Kong in 1865 and Hong Kong Island's first geological map in 1880 (Davis, 1953).

Figure 6: Barren Kowloon, Hong Kong, 1841 (Hong Kong Museum of Art Collection)

Pearl River *Inselberg* island

Situated in the Pearl River near Humen, is a dome-shaped island that geologists refer to as an *inselberg.* This particular granite inselberg is formed from concentric layers of rock with an onion-like structure. As layers of the granite exfoliate, or fall away, during the process of weathering, the *inselberg* island continues to maintain its smooth, dome-like form (Fairbridge, 1968). The *inselberg* island is easily distinguished (Fig. 8) from the shapes of most other regional islands having deeply weathered, irregular, eroded rock remnants at their surfaces.

The *inselberg* island is situated where the Pearl River narrows rapidly north of the South China Sea opening about half way to Canton (Guangzhou), an area referred to at Bocca Tigris, the "tiger's mouth". The *Bocca Tigris* is the historical site of several old Chinese forts that were important during the Opium Wars. This site was a favorite place for artists to draw or paint, appearing in many paintings.

The artist from the *HMS Lion,* whose painting is shown in figure 9, seems to have exaggerated the island's height somewhat, but did catch the *inselberg's* dome-like form.

The *inselberg* island (Fig. 10, lower left) in a painting by William Alexander, clearly is recognizable by its dome-like form.

Though the artists probably lacked geological training, the images they produced are useful to the geologist and geomorphologist in reconstructing the landscapes' history. The artists largely produced images of what they saw rather than what they imagined.

Figure 7: Denuded landscape, Hong Kong, 1833-57. Tombs dug into deeply weathered granite (Hong Kong Museum of Art Collection)

Core stones

Core-stone formation is common where granite is subjected to chemical weathering

Figure 8: Granite inselberg island (in background) near Humen, 1994 (Photo by W. Parham)

in the wet tropics. Weathering along joint planes in granite leaves adjacent rock unaltered. Once the vegetative cover is removed, erosion carries away the weathered material from the joint planes, resulting in collections of fresh core stones on the land's surface that resemble a pile of sugar cubes. Even today, during periods of heavy rains, core stones as large as automobiles, slide or roll down hillsides threatening people and man-made structures.

Core stones are common in the Pearl River Delta region. A dense collection covers part

Art and the Pearl River Delta Environment – Continued

of Tai A Chau, a small granite island west of Hong Kong (Fig. 11).

A sketch of a section of a village shoreline (Fig. 12) by William Lodder, shows large core stones along the shore as well as some smaller ones on the barren land of the hills above.

Figure 9: Pearl River inselberg island, 1793-94 (Permission of Cornell University Library, Wason Collection of East Asia)

In this view of Hong Kong (Fig. 13), the left half of the painting of Hong Kong Island shows a surface covered with numerous core stones. The right half, on the other hand, shows very few. Geological maps (Allen, and Stephens, 1971) show that the left half of the island is composed of granite as is the lower right-hand part, and the upper right half is composed of volcanic rocks. Core stones form more readily in areas where granite is the bedrock, and are less likely to form from volcanic rocks, which have a different texture and structure.

Figure10: Pearl River inselberg island, 1796 (Hong Kong Museum of Art Collection)

Beng-gang gully erosion

Beng-gang is the Chinese name for the horse-shoe shaped, gully erosion features

Figure 11: Core stones on Tai A Chau, Hong Kong, 1998 (Hong Kong Geological Survey Collection)

common in deeply weathered granite areas of South China. Typically, the gully has a steep back wall and a narrow outlet like the one in Zhuhai (Fig. 15). *Beng-gang* gully erosion can develop rapidly on hill slopes where vegetation is sparse or absent during periods of heavy rainfall. Chinese researchers (in Parham *et al.*, 1993) found that a combination of biological and engineering techniques works effectively to halt the *beng-gang* erosion process.

Murdoch Bruce's Hong Kong painting (Fig. 14) shows well developed *beng-gang* gully erosion in grass-covered, weathered-granite hills.

Lt. Martin, a navy artist, similarly shows advanced beng-gang erosion in grass-covered hills at Annunghoi within a Chinese fort at *Bocca Tigris* (Fig. 16).

The Western and Chinese artists show that the land was largely deforested and badly eroded 200 years ago. The condition of land then and now

Figure 12: Barren land and core stones, Hong Kong, 1833-57 (Hong Kong Museum of Art Collection)

appears to be similar even though efforts have been made in some areas over recent years to restore tree cover. Even though the artists probably were not trained in geology, they demonstrated keen observations in their

Figure 13: Numerous core stones on granite area of Hong Kong Island, 1854 (Hong Kong Museum of Art Collection)

artworks related to the nature of the land surface. Early geologists visiting the Pearl River Delta region could have, or perhaps even did, benefit from examining the local

Figure 14: Beng-gang erosion and core stones, Hong Kong, 1846 (Hong Kong Museum of Art Collection)

Figure 15: Beng-gang gulley erosion in weathered granite, Zhuhai, PRC, 2003 (Photo by W. Parham)

art of that time. Their assessment of the correctness of the artists' observations regarding the state of the land could have provided useful information early on about the bedrock geology, and the weathering and erosion history of the region.

The presence of core stones, core-stone distributions, wide-spread beng-gang gully erosion, and the presence of tombs dug by hand, for example, are all important clues to reconstruct the region's geological history and to identify the geological processes affecting the region.

Today, the Pearl River Delta economic zone accounts for about one-third of China's total trade and land development is taking place here very rapidly. Nevertheless, it is likely that today's artists will continue to record the rapidly moving land changes for us, and that within these images, they will record important information useful to ecologists and geologists.

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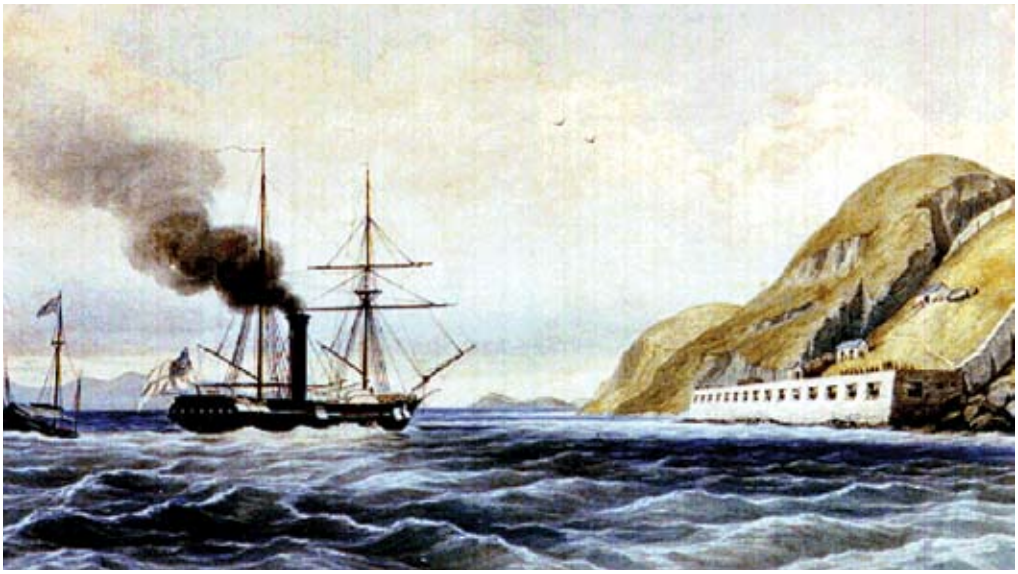

Figure 16: Beng-gang gulley erosion, Annunghoi, Pearl River, 1847 (Hong Kong Museum of Art Collection)

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FAS

NEWS & NOTES from FAS Headquarters

Biological and Chemical Weapons

To increase awareness of the pitfalls of research that could potentially be used for malevolent purposes, the Federation of American Scientists launched an internet based tool to illustrate the experience of scientists who have dealt with "dual use" scientific research. This online learning tool illustrates the implications of dual use biology research through case studies of three different researchers, and provides a historical background on bioterrorism, bioweapons and the current laws, regulations and treaties that apply to biodefense research. Biology graduate students and post-docs, technicians, and their principal investigators are encouraged to access the modules. The Case Studies in Dual Use Biological Research online learning modules are funded through a grant by the Carnegie Corporation of New York. To learn more about the modules please visit: **http://www.fas.org/biosecurity/education/dualuse/ index.html** and **http://fas.org/biosecurity/resource/**

Nuclear Information Project

A new FAS report finds that the U.S. military, intelligence agencies, and conservative think tanks and news organizations are exaggerating China's nuclear weapons capability to justify developing a new generation of nuclear and conventional weapons. Likewise, the report found that the Chinese have been citing U.S. weapons upgrades as a rationale for modernizing theirs, locking the two nations in a dangerous action-and-reaction competition reminiscent of the Cold War. Based on unclassified and declassified U.S. government documents as well as commercial satellite images of Chinese installations, the 250-page report, "Chinese Nuclear Forces and U.S. Nuclear War Planning," provides a detailed overview of China's nuclear forces and its plans to upgrade them. It also describes two nuclear strike scenarios that calculate the casualties that each side would suffer. To read the report please visit: **http://www.nukestrat.com/china/chinareport.htm.**

Information Technologies

FAS, along with the Entertainment Software Association released groundbreaking recommendations calling on government, educators, and business to develop comprehensive strategies to use video games to strengthen U.S. education and workforce training. The action plan identifies steps that the federal government, industry and education community can take to develop a comprehensive strategy to take advantage of the features of video games to address the increasing demand for high quality education and training, and commercialize educational games to help students and workers attain globally competitive skills in demand by employers. The action plan is based on deliberations from the National Summit on Educational Games held on 25 October 2005 in Washington, D.C. The Summit brought together more than 100 experts to examine how to harness the power of video games for learning. To lean more about the Summit on Educational Games or to read the report, please visit **http://fas.org/gamesummit/**.

Housing Technology

FAS, with an industry advisory panel assembled by the Charles Pankow Foundation and the Architectural Engineering Institute of the American Society of Construction Engineers, will test the use of cementitious structural insulated panels (CSIPs) in multi-level construction. This research, funded by the Charles Pankow Foundation, will investigate the load bearing elements of CSIPs in six- to eight-story structures. The project will include the compilation of all available technical information to date; the creation of a design portfolio of optimal CSIPs construction; testing the designs using computer simulations and physical tests; and finally a thorough analysis and evaluation of the cement-based technology.

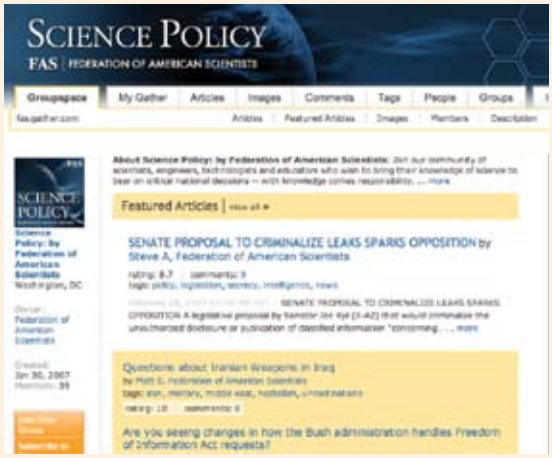
FAS LAUNCHES NEW SOCIAL NETWORKING WEBSITE

By Monica Amarelo

FAS created an online community of scientists, engineers and educators to weigh in on critical national science policy issues. At Fas.gather.com, you can share your insight with like-minded people and exchange ideas, photography, audio, or video. It's a place to contribute commentary and inspiration.

Please visit, sign-up, and post comments to posts on issues in science that impact the world. You can also submit your own articles and opinion pieces. The current focus is strategic security but content will soon include education & building technology.

For additional information please contact Jeff Aron at **jaron@fas.org**.



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