A world without war

A WORLD WITHOUT WAR

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To Jo…

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Contents

Preface

Within the pages of the International Student/Young Pugwash (ISYP) Yearbook 2006, the reader will find deliberations on a variety of topics, ranging from those that inspired the establishment of the Pugwash Conferences on Science and World Affairs in 1957 (namely, the perils of the nuclear era and the social responsibility of scientists) to those that are now in the minds of many global citizens (that is, terrorism and environmental degradation).

Unifying these topics is the need to understand the conflictive situation of our societies from a yet-to-form integrated and reflexive analytical approach. Such approach, however, will require a bold reassessment of the state of our planet, linking different spheres of social and political action with the constraints and realities of a shared material world.

The contents of this volume are a modest, yet useful, contribution to the construction of a new approach to human conflict. Derived from ISYP activities that took place between 2004 and 2006, the articles contained in the ISYP Yearbook 2006 touch upon different dimensions of conflict while illustrating a multidisciplinary approach through several cases. They are, furthermore, an example of the interaction between generations, incorporating the views of established scholars and future researchers, professionals, and policymakers.

Both in its title and spirit, the ISYP Yearbook 2006 *A world without war* continues to honour the memory of Sir Joseph Rotblat, a long time supporter of the involvement of youth in the elimination of nuclear weapons and the prevention of war. 'A world without war' was the last speech he delivered at a Pugwash Conference. It is published here for the first time. This edition also furthers the quest of ISYP to engage young scholars in a deep reflexion on the state of affairs of our planet and, more importantly, on the possible avenues that our societies might take to achieve a peaceful future.

Arthur Petersen & Juan Pablo Pardo-Guerra

ISYP Workshop on New Challenges to Human Security, Wageningen, June 2006

Report

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International Student/Young Pugwash (ISYP) and Pugwash Netherlands organised two workshops on "New challenges to human security" in Wageningen, the Netherlands from 14-18 June 2006.

The document *New Challenges to Human Security: Empowering Alternative Discourse* [1] served as the background for further debate during both workshops. The choice for this theme emerged from a renewed attention for formulating future areas of intervention by Pugwash. In particular, debate on this issue sought to contribute to find answers to the question of 'how can organisations such as Pugwash – and its individual members – promote real progress on issues of the World Problematique [2]. There is no lack of opinions on what should be done, what we find missing is the question 'how'. This is where Pugwash hopes to find new insight and to achieve practical results. This report describes the ISYP workshop's programme, speakers, participants and outcomes in terms of the areas which require our attention.

As knowledge of human security is accumulating, the subject, holding complex interrelated problems, forced us to select a theme which could be discussed within a limited time frame by our participants and speakers. We therefore chose to study the dynamics and processes of present-day con-

Workshop participants in front of the Hotel de Wageningse Berg

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flict situations from a variety of perspectives, with a particular emphasis on their relationship with human security (such as the political economy of war, the ethnic and religious dimensions of conflict, the influence of poverty and environmental degradation on conflict, et cetera.).

The ISYP workshop took place from 14-16 June 2006. Several of the participants of the ISYP workshop were invited to take part in the subsequent senior Pugwash workshop (from 16-18 June) as well. The call for applications to the workshop was spread widely within the ISYP and Pugwash community, inviting also non-members to apply. Selection of applicants was based on proven familiarity with the different facets of human security and on motivation. Eventually, out of 46 applications, 23 people were invited from India, Palestine, Iran, South Africa, Russia, USA, Australia, Denmark, Belgium and the Netherlands. Generous support from the Netherlands Ministry of Foreign Affairs made it possible to host the workshop in Hotel de Wageningse Berg in Wageningen and supply several participants from abroad with travel assistance [3].

The two-and-a-half-days programme featured one day of keynote lectures from several distinguished speakers and a full-scale moderated role-play of an actual international conflict situation. The programme was intensive, requiring participants to stay actively involved during morning, afternoon and evening sessions. During the last session, challenges to prevent conflict as well as the role that ISYP could play in this were identified and presented to the participants of the subsequent Pugwash workshop.

The keynote lectures

During the first day of the workshop, the speakers elaborated on the issue of contemporary conflict. As an introduction to the discussion, Eric Ferguson referred to the Russell-Einstein Manifesto, written as a reaction to the nuclear threats to humankind. Now, approximately fifty years later, we are again at a point in time where it is necessary to question the current state of the world and the changing threats to humankind. Ferguson envisioned our society as people living on a steep hill. This hill is getting increasingly steep, carrying the risk that we can fall off together; successions of events could draw the whole world into a similar situation. The danger is that it is not possible to predict when the situation will pass beyond a point of no return.

Eric Ferguson (left) and Georg Frerks (right)

Ferguson furthermore emphasised that people often are captured in particular systems of thinking and reasoning, which disables them to achieve progress in situations of conflict.

While referring to the terminology as used by the Club of Rome, Ferguson emphasised that we should not look at the world 'problematique' but at the 'resolutique': the implementation of sensible changes in this real world can be seen as a task for Pugwash [4]

Ferguson's introduction aptly summarised what during the ensuing workshop proved to be one of the main challenges to conflicts: the approach of conflicts by the

'dominant discourses'. Irna van der Molen, who chaired the workshop, explained that the workshop aimed at a better understanding of contemporary conflict in relation to human security and to find the challenges for Pugwash in this context. She furthermore set out the questions, that were presented to the speakers: Do we ask the right questions? What are the hidden assumptions, and what are the intrinsic contradictions in these assumptions? What are the lacunas in our own research and where do our analyses and approaches fail?

Georg Frerks started by explaining that the field of conflict studies is not yet crystallised: looking at conflicts is a matter of perception and discourses which makes it difficult to provide a balanced picture. Historically, specific approaches or discourses have been linked to specific types of conflict. Whereas the cold war was related to proxy wars and the idea of a new world order was related to human intervention, the relatively new war on terror is associated with the so-

Jolle Demmers (left) and Pyt Douma (right)

called 'all means necessary' approach. This approach is increasingly problematic for the concept of 'human security'. Whereas the security and development domains were formerly separated, they are now interrelated, which is endangering and narrowing the idea of human security.

One of the challenges of conflict analysis is therefore to deal with this 'labelling' of conflicts. As conflicts are caused by a dynamic entity of external as well as internal factors, the 'labelling' of conflicts is one of the pitfalls in arriving at a solid analysis of conflict resolution. Mislabelling poses a threat to the world when, for example, the focus on terror results in a lack of attention to other dimensions, such as resources, environmental degradation, poverty or disease (e.g. HIV/AIDS). This means, as a consequence, that the 'répertoire' needs to be revisited: the analyses of contemporary conflict should not be limited to solely the military discourse.

There is an increasing need for a broadened scope and integration of factors such as society and human rights in the discussion. The dichotomy between peace and conflict seems no longer to hold. Within this changing context the new challenges are not only to re-define conflict and its stakeholders, but also to revise the meaning of peace (nowadays it is not always clear where peace ends and violence starts). Eventually, this could lead us, on the one hand, to conclude that the concept of 'human security' plays a key role in the discussion on contemporary conflict, while, on the other hand, there is a risk of the constant narrowing of this concept within the current political climate.

Pyt Douma [5] talked about conflict in relation to poverty and the political economy of conflict. He continued, from another perspective, with the danger of labelling: measurement and determination of poverty from an academic perspective has the risk of creating an – artificial – line between who is poor and who is not poor. A solution can be found in the concept of 'relative deprivation' in which the notion of the group or community is taken into

account. As poverty in itself will not always lead to conflict, a better analysis of the underlying factors leading to exclusion and deprivation (such as issues of distribution or self-enrichment of resources bases) is necessary. In relation to this, identification of stakeholder groups is difficult (who speaks for whom) and needs improvement.

Douma furthermore argued that challenges for conflict analyses are to be found in the area of research versus policy as well as within the analysis of conflict itself. The relation between research and policy is relevant as it concerns the question of to what extent conflict-analyses can influence practice.

With respect to conflict analysis, it can be concluded that there is a lack of insights into the various linkages of the factors that influence conflict: for example, how can we determine the role of 'drought' in relation to other factors that have a role in the origin of a conflict? Important questions arise, such as how we measure factors; how we link factors practically; and how we incorporate conflict dynamics. Conflicts are highly complex, meaning that a translation to the level of policy-making is not always possible. At a practical level, this creates the pitfall that policymakers will use an 'à la carte' approach of choosing and emphasising factors as the fundament of their policy towards conflicts. Within this dilemma, the question on the responsibility of academics can be an issue of specific interest for Pugwash.

Douma furthermore emphasised that new types of war can lead to increased difficulties with regard to the abuse of non-armed civilians: during day-time, civilians are peasants; in the night-time they pick up arms. This leads to the question of definition: when are people civilians and when are they part of armed groups? In addition, further analyses should be made of the linkages from outside the episodes of violence: how are goods, resources or finance provided? Douma gave examples of the Tamils, whose resource base is outside the country: the received financial recourses from diasporas make it more difficult for the Sri Lankan government to take away their resources as should be in a case where groups gain their resources from, for example natural resources exploited in the country itself. These linkages to the world economy are often a 'blind spot' in regulation.

Jolle Demmers [6] discussed lacuna, mantras and pitfalls in conflict analysis. Amongst other things, she argued that academics need to be aware of the 'political' interpretation of violence and conflict. Often, the interpretation is closely related to the trend set by the international politics of the moment. History shows, in this perspective, the political interpretations set by the agenda of the international community: in 'ethnic conflicts' where an ancient hate was seen as a root cause, a non-intervention approach was adopted; in the current 'war on terror', often interpreted in religious terms, all means necessary are accepted. In relation to this, conventional views on new wars seem to create a 'them' and 'us' division: rather than on similarities the focus is set on differences.

Paul Richards

Demmers furthermore stated that a multidisciplinary approach to conflict is not without problems. Obviously, everybody knows the mantra that 'every conflict is complex' and that it is necessary to 'approach conflicts from a multidisciplinary perspective.' Under the heading of multidisciplinary, problems can arise since the outcomes of analysis through different disciplines are not always homogenous; they often are contradictory. Whereas an increased focus on the underlying assumptions and contradictions can provide relevant

insights, this does not mean that we should always try to come to a coherent approach as such may not exist.

Other lessons for conflict analyses are that, without saying that differences in identity cause conflict, identity is crucial but needs to be handled with care. Another pitfall in conflict analysis is the equation of conflict with 'clustered violence episodes'. Often different violence episodes are clustered together and are then headed under the 'master' conflict. Demmers gives examples of the Tamil Tigers and the Sri Lankan Government and the Hutus and Tutsis: not all violence in these areas is a result of these existing conflicts. A more solid analysis could provide better insights into these complex pictures.

Finally, Paul Richards [7] argued that, in the last decades, the theory of war has been merely developed from a military perspective. As it was assumed, from the perspective of social scientists, that decisions of war were made by the people in charge, with broad social analysis of the phenomenon of war failing to occur. Richards pointed from this perspective to the relevance of the work of Émile Durkheim, which deals with social exclusion and social cohesion. For social bounding, the manners are the same all over the world: people need to feel included within a society.

Richards gave as an example the situation of the demonstrations in France: although the young people involved have been studying the language and literature of France, they have not been integrated within society. Durkheim argues that for social bounding, education, skill formation and employment are the fundaments that create beliefs. Exclusion of these fundaments will lead to a lack of cohesion, which can lead to conflict. This calls for an increased focus of conflict analyses on empowerment and a sociological approach of conflict. The relevance is moreover made clear by an example of the war in Iraq: despite the establishment of a constitution and free elections there has been no social bounding of the society. This lack of bounding can be tackled more successfully by providing employment and education. A more cautious distinction between security issues and employment issues should thus be made.

The role-play

Instead of asking individual participants to present papers on their views on human security, we chose to use a role-play on a present day conflict. This is a method often recurred to at international conferences and institutions of education that aims to increase the awareness of participants on the interlinking issues of complex (international) problems. This role-play was set up as a public peace process, meaning that official negotiations were not the aim of the process; instead participants were given a better insight in the causes of the conflict, thus offering an opportunity to change their perspectives and mutual relation-ships. This implied that participants were asked to actively take part in the exercise, either playing an individual or representing one of the organisations involved in the

Nagorno-Karabakh and neighbouring countries

conflict. Participants were provided with coaching, guidance and feedback during the process in which the conflict was 'enacted'. The role-play on this conflict was purchased from the Harvard Law School Program on Negotiation (www.pon.harvard. edu), combined with video material produced with support of the Dutch Peace Organization IKV (www.ikv.nl), and background material from the us Institute of Peace (www.usip.org).

Participants engaging in the Workshop's role-play

The role-play concerned the conflict over Nagorno-Karabakh. The recent history of Armenia and Azerbaijan, as well as the domestic politics and foreign relations of both countries, are inextricably bound up with the conflict between them over the territory of Nagorno-Karabakh. During the Soviet period, this territory was an autonomous province within the Azerbaijan SSR with a predominantly ethnic Armenian population. The Soviet Union incorporated the predominantly Armenian region as the Nagorno-Karabakh Autonomous Oblast (NKAO) in the Azerbaijan SSR in 1923.

In 1991, as the Soviet Union was collapsing, a referendum held in the NKAO and the neighbouring district of Shahumian resulted in a declaration of independence from Azerbaijan as the Nagorno-Karabakh Republic (NKR), which remains unrecognised by individual nations – including Armenia – and international organisations. In the final years before the dissolution of the Soviet Union, the region became a source of dispute between Armenia and Azerbaijan, culminating in the Nagorno-Karabakh War. Since the end of the war in 1994, most of Nagorno-Karabakh and several regions of Azerbaijan around it remain under Armenian military control. Since then, the parties have been holding peace talks mediated by the OSCE Minsk Group.

On the first evening of the workshop, general information on the area and conflict was presented and distributed by two experienced consultants. Next, each participant was appointed a character which he or she should play during the game. Roles existed for playing an Armenian or Azeri politician, historian, journalist, civilian, or representative of a local NGO. Preceding the role-play, ample opportunity was given to pose questions regarding the conflict background. On the subsequent morning of the role-play, a documentary ('Hope dies last') was shown on the human tragedies caused at both sides by the fighting parties.

As a start-up, participants told each other 'their' life story which they had to improvise based upon their character descriptions. Initially it turned out to be difficult to the participants to really get into their character and to overcome their rational and peace-minded self. However, the personal stories told created numerous tensions hampering the task to reconstruct a mutually accepted history. Increasing mistrust led to conflicts over procedures regarding speaking time and aim of the gathering.

Nonetheless, the participants were still too focused on reaching agreement instead of being part of the conflict. To aggravate the conflict situation, the coaches brought in a message on the 'kidnapping' of the son of one the participants by the opposite party. At that point the conflict really ignited, bringing furious debates on the conditions of exchange. In addition, a perceived lack of support and respect led to the separation of people within one party, thus pressurising the remaining party members to come to terms. A lack of clear stance felt by the parties even led to well-acted mistrust towards the coaches and meeting organisers.

During the evaluation of the role game in the final session, participants concluded that within a peace-building process or within negotiations peoples' personality and the group's dynamics are fundamental to success. As organisers, we have found this an extremely interesting and active way to engage people in the search for creative solutions.

Some conclusions and recommendations

The following day, in the final session of the ISYP workshop, participants were asked to identify –based upon their experiences during the role-play and the keynote lectures – the essential handles in preventing violent conflict. The experiences were collected in a brainstorm session and later on reformulated for presentation to the Pugwash workshop participants. The following recommendations both address the international community and Pugwash/ISYP.

1. The deconstruction of academic, national and international discourses on conflict, conflict resolution and peace processes should take place by asking what motivations are at the basis of arguments, recognising that the interpretation of conflict is political in itself. Attention should focus particularly on discourses that are used to obfuscate unilateral violence.
2. Strategies to resolve conflict should be linked to an in-depth understanding of the different realities of conflict, as 'the conflict' is a master narrative, where violent episodes are all put under the heading of 'the conflict'.
3. The 'them' and 'us' division may blur our understanding of solutions. We tend to pay attention to internal conflicts and external solutions, perhaps we need to pay more attention to the external dimensions of conflict and the viable internal solutions.
4. Appropriate socio-economic strategies are essential for long-term stability. These should not only be developed at national levels, but also at the regional and community level. This includes:
   a. Promotion of regional economies to counter devastating environmental and human effects of globalisation
   b. Stimulation and review of the debate on economic empowerment strategies for deprived and poor communities. Where are the systematic exclusions of young people in societies occurring?
   c. Devising of adequate strategies to re-integrate ex-combatants; community based approaches which take local priorities as an entry point.
5. Pugwash can issue a journal dedicated to prevailing discourses on 'peace building'.
6. Pugwash can identify and bring attention to situations of exclusion by taking exclusion as a point of departure for analysis, as:
   a. Exclusion (of groups in general and youth in particular) is often at the basis of conflict and its perpetuation, forming a threat to human security
   b. Strategies to combat terrorism are a challenge to human security and civil liberties
7. Pugwash can provide a critical review of this discourse capturing the complexity of the problems. This review should acknowledge:
   a. The feelings of horror provoked by terror and violence

    b.   Knowing the audience of terrorist groups: why does terrorism resonate culturally?

8. Pugwash can provide a platform for discussion on democracies which are more adjusted to historical context, regional setting, local culture and being aware of different interpretations and expectations of democracy

9. Regarding education, it would be important to discover whether Pugwash can provide alternative knowledge to current discourses

10. ISYP can provide a depoliticised platform for youth

11. ISYP should continue using role-plays as bringing knowledge across

At this point in time, no steps have yet been taken to put the recommendations into action. The ISYP participants are all staying in touch and exchanging information on human security matters using a group-oriented website.

Notes

1. Workshop Announcement 'New Challenges to Human Security: Empowering Alternative Discourses – A Pugwash Study Group initiated by Pugwash Netherlands and International Student/ Young Pugwash (ISYP)', published on 24 March 2006. (http://www.pugwash.nl/Documents/ New_Challenges_Workshop.pdf).

2. The latter term was launched by the Club of Rome to describe and understand the many interlinked vital problems facing the world, and their underlying causes

3. Wageningen is in itself a very memorable location because of the battles that took place during Second World War in this location as for the official capitulation of the Germans in the Netherlands in 1945.

4. The Club of Rome states in its Declaration to The Club of Rome (Brussels, April 25, 1996) that: "earlier attempts to identify and analyse the world problematique convince us that we must, on the contrary, work towards comprehensive solutions that involve public participation and negotiation to overcome apathy and confrontation; this is what we call the 'resolutique'." During the senior workshop, Berma Klein Goldewijk referred to resolutique as the values that respond to the world problematique, of which human dignity is an important one.

5. Independent consultant.

6. Assistant professor at the Centre for Conflict Studies, Utrecht University.

7. Professor of Technology and Agrarian Development, Wageningen University.

The Pugwash movement and an agenda for human security

M. S. Swaminathan

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Hunger allows no choice
To the citizen or the police.
We must love one another or die …..
Defenceless under the night
Our world in stupor lies;
Yet, dotted everywhere,
Ironic points of light
Flash out wherever the Just
Exchange their messages;
May I, composed like them
of Eros and of dust,
Beleaguered by the same
Negation and despair,
Show an affirming flame
W. H. Auden

Today the world is facing a trilemma, or a triple dilemma. Over three billion people, struggling to survive with an income of less than $2 per capita per day, are demanding peace and equitable economic development. Several countries in Africa are, for instance, still in the midst of serious famines. As the Roman philosopher Seneca said 2,000 years ago, '[a] hungry person listens neither to reason nor religion, nor is bent by any prayer.'

Thus, one aspect of the trilemma is a global craving for peace and development, equitable in social and gender terms. Another side, however, is that there is growing violence in the human heart. Terms like 'ethnic cleansing' and 'biological and biochemical terrorism' are being widely used in the media; the revival of small pox is becoming a possibility; the nuclear peril has again raised its head; there are over 27,000 nuclear weapons in the arsenals of major and minor nuclear powers; the availability of large quantities of highly enriched uranium increases

opportunities for nuclear adventurism. We are living in an age of increased nuclear and bio-perils.

The third side of the trilemma is the spectacular progress of science and technology, resulting in and increasing technological and economic divide between industrialised and developing countries. If access to technology has been a major cause of economic inequity in the past, the challenge now lies in enlisting technology as an ally in the movement for social and gender equity.

In 1994, the report of the International Commission on Peace and Food which I chaired was released at UNESCO by its then Director General, Federico Mayor. Unfortunately, the Peace Dividend we had then anticipated as a result of the end of the cold war and the break-up of the Berlin Wall has yet to materialise. In fact, the expenditure on military hardware and internal security is increasing day by day, particularly after the tragic events of 9/11.

Contemporary developmental challenges, particularly those relating to poverty, gender injustice and environmental degradation, are indeed formidable. Adding to these is the HIV/AIDS-tuberculosis pandemic. However, the remarkable advances now taking place in information and communication technology, space technology, biotechnology, agricultural and medical sciences, and renewable energy and clean energy technologies provide hope for a better common present and future. Genomics, proteomics, internet, space and solar technologies and nanotechnology are opening up uncommon opportunities for converting the goals of food, health, literacy and work for all into reality. It is nevertheless clear that such uncommon opportunities can be realised only if the technological push is matched by ethical and ecological pulls. This is essential for working towards a world where both unsustainable life styles and unacceptable poverty become features of the past.

Also, there is a growing mismatch between the rate of progress in science, particularly in the area of molecular biology and genetic engineering, and the public understanding of its short and long term implications. There is an urgent need for institutional structures which can inspire public confidence that the risks and benefits are being measured in an objective and transparent manner. Scientists and Technologists have a particularly vital role to play in launching an ethical revolution. The Pugwash movement, which I now have the privilege to lead, is an expression of the social and moral duty of scientists to promote the beneficial applications of their work and prevent their misuse, to anticipate and evaluate the possible unintended consequences of scientific and technological development, and to promote debate and reflection of the ethical obligations of scientists in taking responsibility for their work.

It is appropriate to quote in this context what Albert Einstein once said,

> Concern for man himself and his fate must always form the chief interest of all technical endeavours in order that the creation of our minds shall be a blessing and not a curse.

Shall we renounce war and violence as a method of settling disputes, or shall we put an end to the human civilization? This is the question facing us today, more than fifty years after the Russell-Einstein Manifesto. We are witnessing growing intolerance towards diversity and pluralism in human societies, as for example in terms of religion, ethnicity, political belief, colour, culture, gender and language. In contrast, the goal of sustainable development, accepted in various UN Conferences including the recently held World Summit on Sustainable Development at Johannesburg, can be realised only if there is harmony between humankind

and nature. It is obvious that we cannot be non-violent to nature if we continue to be violent to each other.

We now have a global Convention on Biological Diversity to help in the conservation and sustainable and equitable use of biodiversity. We need urgently a similar Convention on Human Diversity. While a Convention alone will not be able to halt the growing intolerance of diversity, particularly with reference to religion and political belief, it will help to foster a mind set which regards diversity as a blessing and not a curse. Both biodiversity and human diversity are essential for a sustainable future.

It is also necessary to reflect on methods for giving meaning and content to the ethical obligations of scientists in relation to society. The World Conference on Science held at Budapest in 1999 called for a new social contract between scientists and society. With a rapidly expanding Intellectual Property Rights (IPR) atmosphere in scientific laboratories, the products of scientific inventions may become increasingly exclusive, with access being limited only to those who can afford to pay. The rich-poor divide will then increase, since orphans will remain orphans with reference to scientific attention. How can we develop a knowledge management system which will ensure that inventions and innovations of importance to human health, food, livelihood and ecological security benefit every child, woman and man? This is now being discussed in the forum of the World Trade Organisation, particularly with reference to drugs that form part of the treatments of HIV/AIDS. In this sense, I propose that UNESCO may explore the possibility of establishing an International Patents Bank for Peace and Human Wellbeing. Scientists and technologists from all parts of the world should be encouraged to assign their patents to such a Bank, so that the fruits of scientific discoveries become available for public good. Such a Patents Bank for Peace and Human Wellbeing would stimulate scientists to consider themselves as trustees of their intellectual property, sharing their inventions with the poor in whose lives they may make a significant difference for the better.

The French mathematician, Marquis de Condorcet – a contemporary of Thomas Malthus – said over two centuries ago that human population will stabilise itself only if children are born for happiness and not just existence. The Government of Bhutan has taken the lead in developing a Gross National Happiness Index, based on the economics of human dignity, love of art and culture and commitment to spiritual values. Making all well to do members of the human family regard themselves as trustees of their financial and intellectual property will be essential for fostering a human happiness movement. We already have many philanthropic organisations for harnessing financial resources. The organisation, under UN auspices, of an International Patents Bank for Peace and Human Wellbeing will help scientists and technologists to practice what the great Indian spiritual and intellectual leader Swami Vivekananda advocated as the true pathway to human fulfilment:

> In this life, give everything you can – give money, give food, give love or anything else you can - but do not seek barter

In the ultimate analysis, peace and security are vital for global sustainability. Lasting peace and security can be achieved only if the principles of equity (gender and social) and ethics get integrated into the global developmental agenda. It would be useful to recall what Bertrand Russel once said, 'wars do not determine what is right-only what is left'.

The first and foremost goal of the Pugwash movement is to rid the world of the nuclear peril. It is unfortunate that sixty years after Hiroshima and Nagasaki, humankind has not yet abandoned the concept of nuclear deterrence. All great struggles in the world – whether they are to obtain independence from colonial rule or the ending of apartheid – have been achieved only through the pathway of non-violence. History teaches us that wars breed wars and that lasting peace will be possible only if violence as a method of resolving conflicts is banished from our minds.

When I assumed the position of President of the Pugwash Conferences on Science and World Affairs four years ago, I was optimistic that the year 2005 would be a watershed year in realising the goal of a nuclear peril free world. Unfortunately, matters are getting worse and not better. This is especially visible through the failure of the negotiations on the Non-Proliferation Treaty. I hope that the Pugwash movement will help to instil a sense of sanity and urgency, particularly among the nuclear power states, about the urgent need for heeding to the advice of poet Rabindranath Tagore,

> With your mind intent, cross this sea of chaos,
> And sail to that shore of new creation

Let the political leaders of the world have the wisdom to concentrate on achieving the UN Millennium Development Goals in the area of hunger and poverty and thereby reach the shore of new creation. The Pugwash movement in turn should promote a global coalition of institutions and individuals who, as pointed out by the poet W. H. Auden, show an affirming flame in the midst of the sea of despair surrounding us.

A world without war

Is it desirable? Is it feasible?

Joseph Rotblat

In the title of my talk on a world without war, I have posed two questions: is it desirable? And, is it feasible? After the many millions of lives lost in the two World Wars of the last century, a world without war is assuredly most desirable. And it has been made all the more desirable by the events that have occurred since the end of the Second World War: not only is a war-free world desirable; it is now necessary, it is essential, if humankind is to survive.

I am referring to the development of the omnicidal weapons, first demonstrated in Hiroshima and Nagasaki. The destruction of these cities heralded a new age, the nuclear age, whose chief characteristic is that for the first time in the history of civilisation, humankind has acquired the technical means to destroy its own species and to accomplish this, deliberately or inadvertently, in a single action. In the nuclear age the human species has become an endangered species.

Actually, this threat did not loom large when work on the feasibility of the atom bomb began in England, soon after the outbreak of the Second World War. We had then a pretty good idea about the terrible destructive power of the bomb. We knew about the blast effect, which would destroy buildings over large distances; we knew about the heat wave, which would consume everything over still greater areas; we envisaged the radioactive fall-out, which would keep on killing people long after the military operations had ended. We even thought of the development of the hydrogen bomb, with its destructive power a thousand times greater. But in our discussions about the effects of these weapons we did not for one moment contemplate the ultimate catastrophe that their use might bring, namely the extinction of the human species. We did not envisage this because we knew that this would require the detonation of a very large number – perhaps a hundred thousand – of megaton bombs. Even in our most pessimistic scenarios we did not imagine that human society would be so stupid, or so mad, as to accumulate such obscenely huge arsenals for which we could see no purpose whatsoever. But human society was that insane. Within a few decades, arsenals of that magnitude were manufactured, and made ready for use by the two then superpowers, the United States and the Soviet Union. On several occasions, during the Cold War, we came

perilously close to their actual use. I remember, in particular, one such occasion, the Cuban Missile Crisis forty-two years ago, when we were a hair's breadth away from total disaster, when the whole future of our civilisation hung on the decision of one man. Fortunately, Nikita Krushchev was a sane man, and he withdrew at the last moment. But we may not be so lucky next time. And next time is bound to happen if we continue with current policies.

Morality is at the very basis of the nuclear issue. Are we going to base our world on a culture of peace or on a culture of violence? Nuclear weapons are fundamentally immoral: their action is indiscriminate, affecting military as well as civilians, aggressors and innocents alike, killing people alive now and generations as yet unborn. And the consequence of their use might be to bring the human race to an end. All this makes nuclear weapons an unacceptable instrument for maintaining peace in the world. But this is exactly what we have been doing during, and after, the Cold War. We keep nuclear weapons as a deterrent, to prevent war by the threat of retaliation.

For the deterrent to be effective, the threat of retaliation must be real; we must convince the would-be aggressors that nuclear weapons would be used against them, otherwise the bluff would soon be called. George W. Bush, Vladimir Putin, or Tony Blair, must show convincingly that they have the kind of personality that would enable them to push the button and unleash an instrument of wholesale destruction. I find it terrifying to think that among the necessary qualifications for leadership is the readiness to commit an act of genocide, because this is what it amounts to in the final analysis. Furthermore, by acquiescing in this policy, not only the leaders but each of us figuratively keeps our finger on the button; each of us is taking part in a gamble in which the survival of human civilisation is at stake. We rest the security of the world on a balance of terror.

In the long run this is bound to erode the ethical basis of civilisation. I would not be surprised if evidence were found that the increase of violence observed in the world – from individual mugging to organised crime, to terrorist groups such as al-Qaeda – has some connection with the culture of violence under which we have lived during the Cold War years, and still do. I am particularly concerned about the effect on the young generation.

We all crave a world of peace, a world of equity. We all want to nurture in the young generation the much-heralded 'culture of peace'. But how can we talk about a culture of peace if that peace is predicated on the existence of weapons of mass destruction? How can we persuade the young generation to cast aside the culture of violence, when they know that it is on the threat of extreme violence that we rely for security?

I do not believe that the people of the world would accept a policy that is inherently immoral and likely to end in catastrophe. This was evident in the reaction to the destruction of the two Japanese cities, a reaction of revulsion, shared by the great majority of people in the world, including the United States. From the beginning, nuclear weapons were viewed with abhorrence; their use evoked an almost universal opposition to any further use of nuclear weapons. I believe this is still true today.

On the international arena this feeling was expressed in the very first resolution of the General Assembly of the United Nations. The Charter of the United Nations was adopted in June 1945, two months before Hiroshima, and thus no provision is made in the Charter for the nuclear age. But when the General Assembly met for the first time in January 1946, the first resolution adopted unanimously was to seek the elimination of atomic weapons and all other weapons of mass destruction.

However, from the very beginning, there were hawkish elements among the US leadership, who wanted to maintain a nuclear monopoly for the United States. General Leslie Groves was the overall head of the Manhattan Project, which developed the atom bomb during the Second World War. In October 1945, two months after Hiroshima, he outlined his views on US nuclear policy in a blunt statement:

> If we were truly realistic instead of idealistic, as we appear to be (*sic*), we would not permit any foreign power with which we are not firmly allied, and in which we do not have absolute confidence, to make or possess atomic weapons. If such a country started to make atomic weapons we would destroy its capacity to make them before it has progressed far enough to threaten us.

During the 59 years since that statement, US policy has undergone a number of changes, but the monopolistic doctrine outlined by General Groves has always been at its base, and now, under George W. Bush, it has become the actual US policy.

During the Cold War years the accumulation of the obscenely huge nuclear arsenals was justified under the doctrine known by the acronym MAD, mutual assured destruction; for each side to have enough weapons to destroy the other side even after an attack. With the end of the Cold War, and the collapse of the Soviet Union, this argument was no longer valid. Then was the time for the abolition of nuclear arsenals, to which the nuclear states are committed under the Non-Proliferation Treaty, signed and ratified by all of them. This, however, did not happen. The United States decided that nuclear arsenals, albeit of smaller size, are needed to prevent an attack with other weapons of mass destruction, such as chemical or biological weapons. And the Bush strategy, partly provoked by the terrorist attack of 9/11 went further still; it made nuclear weapons the tools with which to keep peace in the world.

In a reversal of previous doctrines, whereby nuclear weapons have been viewed as weapons of last resort, the Bush doctrine spells out a strategy which incorporates nuclear capability into conventional war planning. Nuclear weapons have now become a standard part of military strategy, to be used in a conflict just like any other high explosive. It is a major and dangerous shift in the whole rationale for nuclear weapons.

The implementation of this policy has already begun. The United States is developing a new nuclear warhead of low yield, but with a shape that would give it a very high penetrating power into concrete, a 'bunker-busting mini-nuke', as it has been named.

To give the military authorities confidence in the performance of the new weapon it will have to be tested. At present there is a treaty prohibiting the testing of nuclear weapons, the Comprehensive Test Ban Treaty, which the United States has signed but not ratified. If the US resumed testing, this would be a signal to other nuclear weapon states to do the same. China is almost certain to resume testing. After the US decision to develop ballistic missile defences, China would feel vulnerable, and is likely to attempt to reduce its vulnerability by a modernisation and build-up of its nuclear arsenal. Other states with nuclear weapons, such as India or Pakistan, may use the window of opportunity opened by the US to update their arsenals. The danger of a new nuclear arms race is real.

The situation has become even more dangerous under the new National Security Strategy introduced by President Bush. 'To forestall or prevent …hostile acts by our adversaries, the United States will, if necessary, act pre-emptively.'

The danger of this policy can hardly be over-emphasised. If the militarily mightiest country declares its readiness to carry out a pre-emptive use of nuclear weapons, others may soon follow.

Taiwan presents another potential scenario for a pre-emptive nuclear strike by the United States. Should the Taiwan authorities decide to declare independence, this would inevitably result in an attempted military invasion by mainland China. The US, which is committed to the defence of the integrity of Taiwan, may then opt for a pre-emptive strike.

Altogether, the aggressive policy of the United States, under the Bush administration, has created a precarious situation in world affairs, with a greatly increased danger of nuclear weapons being used in combat.

* * *

Ten years after Hiroshima, when we began to appreciate the magnitude of the threat arising from the invention of nuclear weapons, a group of scientists, under the leadership of Bertrand Russell and Albert Einstein, tried to warn governments and the public. We issued a statement which has become known as the Russell-Einstein Manifesto. Let me read two sentences from it:

> We are speaking on this occasion, not as members of this or that nation, continent, or creed, but as human beings, members of the species Man, whose continued existence is in doubt.

And we went on:

> Here, then, is the problem which we present to you, stark and dreadful, and inescapable: Shall we put an end to the human race, or shall mankind renounce war?

I am now the sole survivor of the eleven signatories to the Russell-Einstein Manifesto, and as such, it is my duty – even a mission – to keep on posing this question to the public. With the end of the Cold War, and the cessation – for all practical purposes – of the ideological struggle that has polarised the world community, the nuclear threat has somewhat abated, but it has not gone away. The nuclear arsenals have been reduced, but enough warheads are still kept on hair-trigger alert to cause many millions of casualties if set off deliberately, or by a false alarm, or by some other accident. The danger will exist as long as nuclear weapons exist. Robert McNamara, the US Secretary of Defence, during the Cuban missile crisis, expressed this in a simple statement: '[T]he indefinite combination of nuclear weapons and human fallibility will lead to a nuclear exchange.'

But even if all the arsenals of weapons of mass destruction were eliminated, the security of humankind would not be assured. Nuclear weapons cannot be disinvented. We cannot erase from our memories the knowledge of how to make them. Should, sometime in the future, a serious conflict occur between the great powers of the day, it would not take long before nuclear arsenals were rebuilt, and we would find ourselves back in the Cold War situation.

Moreover, future advances in science may result in the invention of new means of mass destruction, perhaps even more powerful, perhaps more readily available. We already know

about advances in biological warfare whereby gene manipulation could change some pathogens into terrifyingly virulent agents. But entirely different mechanisms might be developed. Just as we cannot predict the outcome of scientific research, we cannot predict the destructive potential of its military applications. All we can say is that the danger is real.

The threat of the extinction of the human race hangs over our heads like the Sword of Damocles. We cannot allow the miraculous products of billions of years of evolution to come to an end. We are beholden to our ancestors, to all the previous generations, for bequeathing to us the enormous cultural riches that we enjoy. It is our sacred duty to pass them on to future generations. The continuation of the human species must be ensured. We owe an allegiance to humanity.

Reaching an agreement on the elimination of the known weapons of mass destruction is very important, because it would remove an immediate source of danger, but in the long run it will not suffice. To safeguard the future of humankind we have to eliminate not only the instruments for waging war, but war itself. As long as war is a recognised social institution, as long as conflicts are resolved by resort to military confrontation, the danger is that a war which begins over a local conflict – for example, over Kashmir – will escalate into a global war in which weapons of mass destruction are employed. The probability of this happening at any given time may be very small, but the consequences – should it happen – are so enormous that we must do everything in our power to eliminate the risk. In this nuclear age we can no longer tolerate war, any war. With the future of the human species at stake, this becomes a matter of concern to each of us. A war-free world has become a dire necessity, and its achievement must be made our steadfast objective.

This brings me to the second question in the title of my talk: is a war-free world feasible? To most people, the concept of a war-free world is a fanciful idea, a far-fetched, unrealisable vision. Even those who have come to accept the concept of a world without nuclear weapons still reject the notion of a world without national armaments as being unworkable.

Such attitudes are not surprising considering that, from the beginning, civilised society has been governed by the Roman dictum: *Si vis pacem para bellum* – if you want peace prepare for war. We have paid heed to this axiom despite the fact that throughout history preparation for war has brought, not peace, but war. With the onset of omnicidal weapons, the dictum seems to have changed to *Si vis pacem para armas* – if you want peace stay armed to the teeth. Accordingly, both sides accumulated huge nuclear arsenals in order to keep the peace, and this policy continues now with only one superpower.

The diabolical concept that in order to have peace we must prepare for war has been ingrained in us since the start of civilisation. So much so that we have begun to believe that waging war is part of our natural make up. We are told that we are biologically programmed for aggression: that war is in our genes.

As a scientist, I reject this thesis. I see no evidence that aggressiveness is genetically built into our behaviour. A group of experts, meeting in Seville under the auspices of UNESCO, concluded: 'It is scientifically incorrect to say that war or any other violent behaviour is genetically programmed into our human nature.' In the distant past, under the harsh conditions in which primitive humans lived, he often had to kill for survival, in competition for food or for a mate. Later on, when communities were formed, groups of people killed other groups of people for the same reason, and war became part of our culture. But now this is no longer necessary. Thanks largely to the advances in science and technology, there should be no need

for people to kill one another for survival. If properly managed and evenly distributed, there would be enough food and other life necessities for everybody, even with the huge increase in world population. The problem, of course, is that other factors (such as greed) come into play, with the result that the resources are not distributed equitably, and thus many people are still starving, many children are still dying from malnutrition. We have still much to do before the potential for removing the basic causes of war becomes a reality.

Nevertheless, we are moving towards a war-free world, even if we do not do it consciously. We are learning the lessons of history. In the two World Wars of the 20th century, France and Germany were mortal enemies. Citizens of these countries – and many others – were slaughtered by the millions. But now a war between France and Germany seems inconceivable. The same applies to the other members of the European Union. There are still many disputes between them over a variety of issues, but these are being settled by negotiations, by mutual give-and-take. The members of the European Union have learned to solve their problems by means other than military confrontation.

The same is beginning to take place in other continents. Military regimes are on the decline; more and more countries are becoming democracies. Despite the terrible bloodshed in recent years – the tribal genocide in Rwanda, the ethnic cleansing in Bosnia and Kosovo, and the murder of children in Beslan – the number of international wars is decreasing. We are gradually comprehending the futility of war, the utter waste in killing one another (although this does not seem to apply to terrorists, who show complete disregard for the sanctity of human life).

All the same, for the concept of a war-free world to become universally accepted, and consciously adopted by making war illegal, a process of education will be required at all levels: education for peace; education for world citizenship. We have to eradicate the culture in which we were brought up, the teaching that war is an inherent element of human society. We have to change the mind-set that seeks security for one's own nation in terms which spell insecurity to others.

We must replace the old Roman dictum by one essential for survival in the Third Millennium: *Si vis pacem para pacem* – if you want peace prepare for peace. This will require efforts in two directions: one – a new approach to security, in terms of global security; the other – developing and nurturing a new loyalty, loyalty to humankind.

With regard to world security, the main problem will be preventing conventional wars between nations, and the use of military arms by governments in settling internal disputes. This will require some limitation on the sovereignty of nations, and perhaps a modification of the Charter of the United Nations, which is based on the notion of sovereign nation-states.

Surrender of sovereignty is highly objectionable to most people, but some surrender of sovereign rights is going on all the time, brought about by the ever-increasing interdependence of nations in the modern world. Each international treaty we sign, every agreement on tariffs or other economic measures, is a surrender of sovereignty in the general interests of the world community. To this equation we must now add the protection of humankind.

It is a thorny problem but it has to be addressed. One of the main functions of the nation-state is to ensure the security of its citizens against threats from other states, which is taken to mean possessing the ability to wage war. A change will be called for in this respect: sovereignty will need to be separated from, and replaced by, autonomy. In particular, the right of the state to make war will have to be curtailed. This means no national military forces, and the only legal

coercive power on the world scale to be vested in some kind of police force responsible to a global authority. Some form of world governance seems a necessary outcome of the evolution of the United Nations.

As a way towards this we have to acquire a loyalty to humankind. As members of the human community, each of us has developed loyalties to the groups in which we live. In the course of history we have been gradually extending our loyalty to ever larger groups, from our family, to our neighbourhood, to our village, to our city, to our nation. I should emphasise that loyalty to a larger group is an addition to, not a replacement of, loyalties to the smaller groups. At present the largest group is our nation. This is where our loyalty ends now. I submit that the time has come for loyalty to another, still larger group: we have to develop and nurture loyalty to humanity.

The prospects for developing a loyalty to humankind are becoming brighter due to the growing interdependence between nations, an interdependence not only in the realm of economics, but also in social and cultural matters; an interdependence brought about by the advances in science and technology, in particular, the progress in communications technology; the fantastic advances in transportation, communication and information, that have occurred in the 20th century, and which I have witnessed in my own long life.

Of particular importance is the progress in information technology, in its various forms. The Internet technology enables us to chat with people wherever they are. It provides access to an infinite source of information, and the means to contribute our own knowledge or ideas. Information Technology has truly begun to convert the world into a global village: we know one another; we do business with one another; we depend on one another; we try to help one another. We are perforce becoming world citizens.

I welcome the fantastic advances in communication and information as a powerful factor against strife and war, because they provide new means for people to get to know one another and develop a sense of belonging to the whole of the world community. In the course of time, this will also reduce the economic gap between rich and poor nations.

Let me summarise. The applications of science and technology, both the negative and the positive, have created the necessity, and the opportunity to foster world citizenship. There is the need for a change in education that recognises our loyalty to humankind; the need to preserve the human species and the continuation of our civilisation.

In the course of many thousands of years, the human species has established a great civilisation; it has developed a rich and multifarious culture; it has accumulated enormous treasures in arts and literature; and it has created the magnificent edifice of science. It is indeed the supreme irony that the very intellectual achievements of humankind have provided the tools of self-destruction, in a social system ready to contemplate such destruction.

Surely, we must not allow this to happen. As human beings it is our paramount duty to preserve human life, to ensure the continuity of the human race.

A nuclear holocaust does not appear imminent. Having come close to it on several occasions during the Cold War, we are now somewhat more cautious. But war is still a recognised social institution, and every war carries with it the potential of escalation with fatal consequences for our species. In a world armed with weapons of mass destruction, the use of which might bring the whole of civilisation to an end, we cannot afford a polarised

community, with its inherent threat of military confrontations. In this scientific era, a global equitable community, to which we all belong as world citizens, has become a vital necessity.

Nuclear disarmament education and the experiences of Hiroshima and Nagasaki

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The communication of the experiences of Hiroshima and Nagasaki appears to be facing a real problem. This needs to be addressed urgently because the *hibakusha* (atomic bomb survivors) are aging rapidly, and when they die, they will take with them the only first-hand knowledge of the unspeakable horrors of nuclear destruction. We must consider new ways to teach children about war and the prospects for peace. We need new approaches which enable the next generation to feel connected to the tragedy in Hiroshima and Nagasaki. And at the same time, we need to feel empowered to take a stand for peace and make a difference in our lives and in the world. In this article, the importance of nuclear disarmament education in a wider context of peace education is stressed and suggestions are offered to improve current nuclear disarmament education in Japan, and elsewhere.

Nuclear weapons have been a crucial point of debate in international politics since their first use on Hiroshima and Nagasaki in August 1945. Due to their immense destructive power, nuclear weapons have played, and continue to play, a fundamental role in the evolution of a variety of conflicts: possible possession of 'weapons of mass destruction' (and, in particular, of nuclear weapons) was one of the original justifications for attacking Iraq in 2003; the North Korean nuclear development programme is likewise a cause of high tensions; and Iran's uranium-enrichment activity is receiving much attention due to the possibility of modifying the basic nuclear fuel-cycle technology for the production of nuclear weapons.

But despite its prominent position in the global spotlight, the nuclear issue no longer catches the attention of ordinary people. Only a few decades ago, during the height of the Cold War, people were aware of the serious likelihood of the use of nuclear weapons. But now, disinterest in the issue is widespread. The general public seems to believe that nuclear disarmament deals with a very fundamental element of national security and is therefore something that ordinary people cannot contribute to, so it is left up to politicians and diplomats to make decisions and take control.

It is within this setting that about 27,000 warheads remain in the hands of the world's nine nuclear-weapon states, the vast majority (97 percent) in the US or Russian stockpiles [1]. And

although the Cold War ended, and the threat of a nuclear confrontation has faded in the minds of many citizens, about 12,500 of these warheads are considered operational – more than enough to kill all life on earth many times over. It seems as if the citizens of the world have grown to accept this outrageous situation; or perhaps they are simply 'numbed' and behaving as if this situation was something that lies beyond their control.

Insofar as people do not change their way of thinking about nuclear weapons, these diabolical 'instruments of genocide' will never be abolished from our world. Ordinary people must therefore become aware of the consequences of this weapon – after all, they are the ones who will be affected – and must play an active role in the decision-making processes. It is thus imperative that nuclear-disarmament educators encourage citizen participation in the decision-making process by teaching about the effects of the use of nuclear weapons and by involving young people in the movement for nuclear disarmament.

The experiences of Hiroshima and Nagasaki, widely documented in the historical literature, should be a lesson on the destructive effects that nuclear weapons have on both humans and the environment. They should not be, as is often the case, a mere anecdotal incident in the larger narration of the US victory in the Pacific during the Second World War. Rather, they must be heralded as paradigmatic examples of the consequences that nuclear weapons have on the lives and future of ordinary citizens and, in this sense, of the dangers they pose to all of humankind.

Nevertheless, with more than 60 years of distance from these events, the memories of Hiroshima and Nagasaki have started to fall into oblivion, even within Japan. Traditionally, the experience of the *hibakusha* (survivors of the atomic bombing) had been the main pillar of peace education in Japanese schools. Teachers who experienced the effects of the atomic bomb were particularly enthusiastic about recounting their experience and teaching students about the importance of peace. But as the average age of the *hibakusha* increases (it currently stands at 73 years), there is a smaller number of *hibakusha* teachers who remain active at schools, making it increasingly difficult to convey their message to the next generation.

Nuclear issues today

The immediate history of nuclear weapons dates back to the early 1940s, when three nuclear bombs were developed under the Manhattan Project as part of the US wartime efforts. As is well-known, the production of nuclear weapons did not end with the hostilities of the Second World War; rather it was exacerbated by the post-war political arrangement, which confronted the United States and the Soviet Union in a hectic arms race. During this Cold War period, the search for an even larger deterrent capability led the nuclear nations to produce and stockpile more than 70,000 nuclear warheads. By the 1980s, humans were living with the realistic threat of total annihilation.

The aftermath of the Cold War brought, however, some encouraging progress, including steps by the US to remove tactical nuclear weapons from most overseas deployments and surface naval vessels; the indefinite extension of the Nuclear Non-proliferation Treaty (NPT); the negotiation of the Comprehensive Test-Ban-Treaty (CTBT); US-Russian cooperation on fissile materials control in the former Soviet Union; and efforts to promote detargeting and dealerting [2]. However, during the latter half of the last decade, progress towards nuclear non-proliferation and disarmament faltered, and enormous opportunities for progress towards

genuine nuclear disarmament were ultimately lost. Today, we face challenges that differ from those present at the height of the Cold War.

Nuclear proliferation

Nuclear proliferation is among the most pressing challenges of our days. During the 2004 US presidential campaign, President George W. Bush and Senator John Kerry agreed that nuclear proliferation was the top national security threat to the United States. This issue remains a great concern, not only for the US, but for the world at large.

Nuclear proliferation has, in this sense, many facets. In terms of horizontal proliferation (namely, proliferation between state or sub-state actors) there is an inherent risk that new groups may obtain access to nuclear weapons. The causes of this are varied. There is, for instance, the danger of former nuclear scientists selling their skills to the highest bidder – as in the recent case of Dr. A. Q. Khan of Pakistan. Likewise, there is the serious threat of proliferation due to the diversion of fissile materials. The transfer of either the fissile materials or of the nuclear weapons themselves to terrorist organisations is, in this sense, a realistic threat in today's security scenario. Thousands of so-called 'tactical' nuclear weapons – some of which are small enough to be transported by a person – are stored in poorly secured locations. Russia is an example of a country with a large number of such locations. Nuclear materials that can be used to make nuclear weapons (such as highly enriched uranium) are even more poorly secured and widely dispersed throughout the world. In this context, old strategies, such as 'nuclear deterrence' (which prevented the use of nuclear weapons between nations) will not be able to cope with the emerging risks of proliferation.

A different form of proliferation (namely, vertical proliferation, whereby the stockpiles of a nuclear country are increased) is also a feasible future scenario. The 9/11 attacks on the United States embroiled the world in a 'war against terrorism' that has as one of its possible components the development of a new generation of nuclear arsenals. In particular, this so-called war gave the Bush administration a reason to pursue the development of a new and more usable nuclear warhead. In the US Nuclear Posture Review of 2002, the Bush administration called for modifying existing nuclear weapons and developing new and smaller versions that would be able to destroy hardened underground targets, neutralise stockpiles of chemical or biological weapons, and 'reduce collateral damage' from nuclear detonations [3]. Arms-control advocates fear that renewed US development of nuclear weapons will spark similar actions by other nuclear nations and damage long-standing efforts to prevent the further (horizontal) proliferation of nuclear weapons. In addition, critics charge that mini-nukes (as these tactical weapons are called) blur the distinction between conventional and full-blown nuclear war and make the eventual use of nuclear weapons more likely [4]. While the weapons may be smaller, the effect of radiation remains an important element of risk.

The importance of nuclear disarmament education

For over two decades, the United Nations has acknowledged the importance of educating people about disarmament issues. The tenth special session of the General Assembly in 1978 was the first session devoted to disarmament and the first international forum to declare that disarmament education was urgent. The Final Document of the Tenth Special Session emphasised the importance of two aspects of education – teaching and research – in shaping

the future of disarmament. It urged governmental, non-governmental and international institutions, in particular the United Nations Educational, Scientific and Cultural Organisation (UNESCO), 'to take steps to develop programmes of education for disarmament and peace studies at all levels' [5]. The final document of the World Congress on Disarmament Education, held in Paris in June 1980, stated that disarmament education forms an integral part of peace education and that it has essential links with human rights and development education. In particular, the United Nations Study on Disarmament and Non-Proliferation Education mentioned that [6]:

> The relationship of disarmament to economic and political realities is a fundamental guideline for the development of content in disarmament education […] [That is,] disarmament education should be related to the lives and concerns of the learners and to the political realities within which disarmament is sought […] Disarmament education should also provide insights into the political, economic and social factors on which the security of peoples could be based. Therefore what a school-age child in a refugee camp needs to know about peace and disarmament is not the same as what is required for a security guard or a teacher or a politician […] A combination of traditional and innovative teaching techniques is needed to convey information and enhance analytical thinking in order to facilitate a change in mindsets.

An example of the manner in which this view of disarmament and non-proliferation education can be achieved is visible in the case of Dr. Kathleen Sullivan, a nuclear disarmament educator who teaches nuclear awareness classes in public high schools of New York City [7]. Her classes contain various interactive demonstrations. In one such demonstration, she first drops a single metal pellet in a tin can and explains to students that the sound represents all of the fire power used during Second World War, including the two atomic bombs that were dropped on Hiroshima and Nagasaki. In order to explain the nuclear power that exists today, she then pours in 2,667 metal pellets into a tin, representing the firepower of 32,000 nuclear weapons, with each pellet equivalent to 3 megatons of explosive power. Many students feel overwhelmed by the sound which seems to last forever. As Albert Einstein once said, 'Imagination is more important than knowledge.' Because it is difficult to comprehend the destructive potential of nuclear weapons, this demonstration helps students imagine the power of the nuclear threat through sound.

There is also the 'ribbon demonstration,' which helps students visualise how much of the US federal budget is spent on different areas. Different lengths of ribbon are provided for the military, social welfare, education, and so on. Students are usually surprised by how little is spent on their education or welfare in comparison to the budget for war and nuclear weapons. This is a very good visual demonstration to understand the distribution of abstract concepts, such as the billions of dollars in a federal budget. By revealing these facts that are usually not discussed among young people, students are encouraged to think critically and are given the opportunity to speak out about how they feel. The purpose of nuclear disarmament education is to teach young people to think critically about the dangers of nuclear weapons, what is being done to counter their use and proliferation and how they could support efforts for global nuclear disarmament.

Peace education in Japan: the case of Hiroshima

Betty Reardon, renowned peace educator and Director of the Peace Education Programme at the Teacher's College of Columbia University, defines peace education, a worldwide movement, as a diverse and continually changing field, responding to developments in world society and, to some extent, to the advancing knowledge and insights of peace research. Furthermore, the methodology of peace education encourages critical thinking and prepares students to act on their convictions.

As practiced in elementary and secondary schools, and as presented in university programmes that prepare classroom teachers, peace education goes by various names: conflict resolution, multicultural education, development education, world-order studies, and more recently, environmental education [8]. In this sense, disarmament education forms an integral part of the peace-education curricula.

In particular, peace education in Japan is informed by pacifism and an anti-nuclear ideal. Such components of Japanese peace education derive from the bitter experiences of the Second World War, including the nuclear attacks on Hiroshima and Nagasaki. In this sense, Japanese peace education serves as a reaction to the militarily-oriented education that pervaded Japan before and during Second World War.

Problems in teaching at schools about the Hiroshima and Nagasaki experiences

In 1969, teachers from Hiroshima who had experienced the nuclear attack on their city started an association called *Hiroshima-ken Genbaku Hibaku Kyoshi no Kai* (Hiroshima Prefecture Atomic Bomb Survivors Teacher's Association). Behind the creation of this group was the realisation that, even in Hiroshima, students were unaware of the history of the atomic attacks of 1945. In a 1968 survey on atomic awareness by the Hiroshima prefecture, only 12.1 percent of 5th grade students and 37.7 percent of 8th grade students acknowledged that they learned about the atomic bomb at school. This was a shocking finding for the teachers of Hiroshima, who consequently felt a strong need to promote nuclear awareness education within their classrooms: first-hand knowledge of the experience was deemed as irreplaceable.

Such need for nuclear awareness education derived from first-hand knowledge was also affected by other factors. After the end of the Second World War, a Press Code was instituted throughout Japan, strictly prohibiting the disclosure of facts on Hiroshima and Nagasaki until the San Francisco Peace Treaty of 1952 went into effect. The media, in all its forms, was effectively controlled by the Press Code – ordered by the General Headquarters, Supreme Commander for the Allied Powers – so the histories of the atomic bombs, as narrated by the individual participants of the event, did not propagate among the citizens of Japan or the world. The Press Code thus achieved its purpose: to keep the story of nuclear weapons secret and hide their cruelty in order to prevent anti-American feelings from mounting among the public, both in Japan and the rest of the world.

Within Hiroshima, however, the constant work of groups such as the *hibakusha* – survivors of the atomic explosion – and the Teacher's Association allowed students to better understand the dire consequences of the use of nuclear weapons and thus shaped, to a considerable extent, the public perception on nuclear issues for a number of years. Peace education was thus built around the experiences of the men and women who saw the deadly effects of nuclear explosions and their residual radiation.

In recent times, however, a considerable decline in this type of nuclear awareness education in Hiroshima can be observed. The reasons for this are outlined below.

Firstly, the decline can be explained in terms of the disappearance from schools of teachers who experienced the atomic blasts of 1945. Today there are essentially no teachers at schools with first-hand experience of either war or the atomic attack. In this sense, information is only derived from textbooks and official sources and does not convey the human suffering implicit in the use of nuclear weapons. To some degree, this translates into fewer teachers who feel compelled to teach students about the intricacies and personal meanings of peace and of the individual responsibilities one has to have towards nuclear weapons; teachers are rather caught up in paperwork and in keeping with a tight official curriculum. Without the strong motivation that was behind the original members of the Hiroshima Prefecture Atomic Bomb Survivors Teacher's Association, the students will learn only the official discourse. According to the latest survey by the Hiroshima City Education Centre, when the results for the year 1995 and 2000 are compared, the percentage of the elementary school students in Hiroshima who said they heard about the atomic bomb from their school teachers increased by 6 percent – 80 percent of both elementary and middle school students replied they heard about it from school teachers [9]. On the other hand, the percentage who said they heard about it from family members or the *hibakusha* has decreased. As time passes, they will have even fewer opportunities to learn or hear about the atomic bomb at home, and the role of school education to teach about this experience in a sophisticated manner becomes more important.

Secondly, confrontation between the government and the Teachers' Union has become an increasingly complicated issue. The Japanese government once supported peace education: in 1947, the Ministry of Education published a reader called 'Stories About the New Constitution' for middle school students, and in the chapter on 'Abandonment of war: the Article 9', there was a very moving explanation [10]:

> War is over and we never want to experience such a horrible thing again. What did Japan gain from this war? Nothing. Japan decided two things in order not to enter a war again. One is that we will not have anything related to a war such as a military, warship or warplane. It is called abandonment of force. Abandonment means 'to get rid of,' but you need not to worry. Japan has done the right thing before other countries do. There is nothing stronger than doing the right thing. Another thing is that we will never rely on war when there is a dispute with other countries. We will negotiate instead, because starting a war will lead to a fall of our country eventually. We will never threaten other countries either. This is called abandonment of war. Japan will flourish if we try to become good friends with other countries. Let's try not to repeat the horrible war again.

The turning point for the Japanese government probably came at the time of the Korean War in 1950 [11]. Although the General Headquarters, Supreme Commander for the Allied Powers (GHQ) had made a new constitution for Japan which did not provide the country the right to develop any military power, the United States changed its political strategy when it realised the need for military power for the Korean War. The United States decided to position Japan as an ally and strongly insisted on Japan to be armed. Japan, still under the occupation of the GHQ at that time, had to concede, even if it was against its principles.

The change of policy towards armament in support of the Korean War represented a strong contradiction with peace education, which the Japanese Government had originally endorsed. Since this drastic change of policy towards war and armament, peace education has been something that the Japanese government does not want to promote because it lies in direct contradiction to the nation's security policy [12].

Despite the official stance, teachers in Hiroshima, who had regrets and feelings of betrayal towards the militaristic education of the Pacific War, did not support the Japan-US Security Treaty and continued to teach students pacifism.

Such independence, however, is limited. Since the Prefectural Board of Education is under the control of the Ministry of Education, Culture, Sports, Science and Technology, the Ministry is in capable of issuing teaching guidelines that specify what can or cannot be taught. For example, it can decide whether to amend the Basic Education Law as to include patriotism in the curricula (which is, in Japan, a controversial issue). Its inclusion would make it more difficult for teachers to discuss the Japanese invasion of Asia (which started in 1931 and lasted until the end of the war in 1945). It would also become more difficult to discuss why some Japanese people do not want to stand up during the hoisting of the national flag and the singing of the national anthem at certain events, directly confronting freedom of speech.

Thirdly, the contents of the peace/atomic bomb education may have to be re-examined. The experience of the atomic bomb never changes, but the world has changed drastically over the last 60 years and the way this experience is taught could be improved. Traditionally, classes are conducted rather passively in Japan. When students learn about the atomic bomb in Hiroshima, some schools invite *hibakusha* to their schools and hear the testimony; some schools show videos; some read different articles and literary pieces about the atomic bomb. These are powerful methods, but inviting *hibakusha* is not something you can do indefinitely; it is also a fact that some students feel tired of the same style of peace education repeated every summer for almost 10 years of their school education. Even though it can be quite over-whelming to hear such stories and they may feel helpless, it is important that students feel motivated to do something to promote peace at the end.

According to a United Nations study on disarmament and non-proliferation education, the objectives of contemporary disarmament and non-proliferation education and training should be [13]:

- To learn how to think rather than what to think about issues;
- To develop critical thinking skills in an informed citizenry;
- To deepen understanding of the multiple factors at the local, national, regional and global levels that either foster or undermine peace;
- To encourage attitudes and actions which promote peace;
- To convey relevant information on, and to foster a responsive attitude to, current and future security challenges through the development and widespread availability of improved methodologies and research techniques;
- To bridge political, regional and technological divides by bringing together ideas, concepts, people, groups and institutions to promote concerted international efforts towards disarmament, non-proliferation and a peaceful and non-violent world;
- To project at all levels the values of peace, tolerance, non-violence, dialogue and consultation as the basis for interaction among peoples, countries and civilisations.

Traditional atomic bomb education focuses on the impact of the use of nuclear weapons and human suffering. This is an effective way to engender empathy for what happened in Hiroshima and Nagasaki, and it makes students feel that it should never be repeated. However, this is not enough to stimulate the realisation that nuclear threats still exist or the importance of understanding the nuclear issues in a global context. When high school students learn about Hiroshima and Nagasaki, they should also be encouraged to consider further issues such as nuclear proliferation and have discussions about why the current situation is dangerous; why more states are trying to develop their own nuclear weapons and why some states are neglecting their disarmament obligations. Similarly, the problem of nuclear waste is something to deal with in the context of environmental issues.

There are more nuclear related issues that could be discussed in class, and students should be exposed to different issues and perspectives. The more students are exposed to various issues and trained how to think, the more they will realise all the issues are connected to each other and to human security.

Of course, appropriate topics should be given to each age group. Nuclear deterrence may not be an appropriate topic for elementary school students, although they could well pursue the question of why people feel fear of different nationalities, races or cultures, as it is something they can find out from their everyday life.

Peace education can continue to nurture the value of tolerance, non-violence and hope, and it should be started at a young age. Therefore, peace education in Hiroshima does not necessarily have to focus on the experience of the atomic bomb all the time: it can be expanded into other, more contemporary topics, leading to a deeper understanding of human suffering from violence and war.

Conclusion

These days, the communication of the experiences of Hiroshima and Nagasaki appears to be facing a real problem. This needs to be addressed urgently because the *hibakusha* are aging rapidly, and when they die, they will take with them the only first-hand knowledge of the unspeakable horrors of nuclear destruction. We must consider new ways to teach children about war and the prospects for peace. We need new approaches which enable the next generation to feel connected to the tragedy in Hiroshima and Nagasaki. And at the same time, we need to feel empowered to take a stand for peace and make a difference in our lives and in the world.

A possible approach would be to combine participatory-style nuclear disarmament education with existing peace education. Japanese students have been taught that nuclear weapons are evil, but it is also important to think deeper about why that is so. Students must consider how much money is spent on the military and how this expenditure is affecting their everyday lives. They must question whether Japan should have its own military forces and be able to send troops to foreign war zones. These issues may seem rather difficult for students to digest, but high schools students are old enough to understand and think about these important matters, which affect them directly. Peace education should train students to learn how to think rather than what to think about the critical issues that we face at this time.

In remembering Hiroshima and Nagasaki, it is important to remind all human beings what nuclear weapons have done to both cities and their people. The effects last for many years,

even after the war, and may not be fully known. The scientific effect of nuclear weapons and what *hibakusha* had to go through afterwards should be more widely taught and known, not only in Japan but also in other parts of the world. When people forget about the lessons of Hiroshima and Nagasaki, nuclear weapons may be used again. Peace education should help us to live peacefully, without the threat of destroying life on our shared planet.

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7. Dr. Kathleen Sullivan is a nuclear researcher, disarmament educator, author, and activist who has been engaged in the nuclear issue for the last 20 years and now works for the Educators for Social Responsibility (ESR) as a Coordinator for the Nuclear Weapons Education and Action Project. The author worked for her as an intern for six weeks in 2005.

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Reflections on Korean history and its impacts on the US-North Korean conflict

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In the author's view, nothing in the political behavior of Korean policy (North as well as South) can be understood without reflecting upon the experience of the Korean Peninsula and its people under the policy of the Great Powers. As expressed in the following pages, the author is of the opinion, that one of the main reasons of the radicalisation of the US – and North Korean – policy is the underestimation of the meaning of Korean history before and after its division.

As Richard N. Haass, President of the Council on Foreign Relations and a former member of the White House policy planning staff, stated in a speech concerning US foreign policy '[…] government officials rarely, if ever, have time to ponder history or look too far ahead' [1].

The present discussion about the events that have taken place in the Korean Peninsula is based on a broad agenda, ranging from the process of inter-Korean rapprochement, the relationship this region holds to its former occupier Japan, and the conflict about North Korea's nuclear and missile programme. Without underestimating the importance of any of these issues, the discussion about the North Korean nuclear problem is the 'hot spot' of the international community's attention. As far as many analysts are concerned, the reason for the escalation of this conflict is mainly due to the behavior of North Korea itself. On the other hand, however, there are numerous indicators that show that US policy towards the Korean Peninsula in the past is also responsible for the situation in North Korea that we face today.

The conflict between the United States and North Korea is primarily focused on two issues, namely, the North Korean nuclear programme and the development of ballistic missiles. In search for an explanation for the problem, one often encounters the statement that a solution can only be found if North Korea is willing to implement significant political and economic reforms. Therefore many road maps for North Korea have been worked out, describing precise steps for North Korean reforms. In recognition of the common opinion that a change in Pyongyang's policy is necessary, I am of the view that another major point

why the US policy towards North Korea has often failed is the lack of understanding of Korean history. Under the administration of George W. Bush and its declared policy of regime change, it became quite more difficult to ease the mistrust between the governments in Washington and Pyongyang.

In the following pages, I will argue that a solution to the North Korean nuclear issue will only be possible if the political decisionmakers in the United States are able and – even more – willing to understand that this conflict is embedded not only in a North Korean policy of one-sided brinkmanship, but also in the absence of a broad knowledge of Korean history and its meanings for the Korean people by US officials.

The origins

As historians and analysts have figured out, the opening of the Korean Peninsula toward the world was not a peaceful process but rather a forceful one. In the beginning, it was the economic interest of the western powers in this region (e.g. Great Britain, United States, France and Germany) and the military rivalry between China, Russia and Japan, which pushed Korea into the world community [2].

US and Korea diplomatic relations commenced in June 1882 with the signing of a commercial treaty between the two nations, which also included a provision to render mutual good services in case of aggression by a third state. Don Oberdorfer, author of the book *The Two Koreas*, wrote on this:

> In 1882, as a defensive measure against its neighbors, Korea signed a "Treaty of Amity and Commerce" with the United States, its first with a Western power, in which the United States promised to provide "good offices" in the event of external threat. It was reported that the Korean king danced with joy when the first American minister to Korea arrived [3].

The development on the Korean Peninsula during the period surrounding the signing of the Treaty of Amity and Commerce was dominated by the struggle of supremacy over the region between China, Russia and Japan. It would thus seem that, being under enormous pressure from its direct neighbours, the Korean government was eager to find a potential ally which could mediate in case of a foreign aggression.

Matters occurred, however, in a different way. The United States managed a policy towards Korea aimed at securing their interests without getting directly involved in military action. In July 1905, during the Japanese-Russian war, the United States and Japan signed the so-called Taft-Katsura Agreement. In this secretly signed treaty, the United States assented to Japanese dominance in Korea; in return, Japan agreed to the US presence in Hawaii and the Philippines [4].

With regard to its meanings for the Korean peninsula, the Taft-Katsura Agreement stood in clear opposition to the treaty signed previously between the United States and Korea. Of course, the Korean government was hardly shocked by the US-Japanese contract and made huge efforts to reverse it, although without much hope of success.

A remarkable point in this respect is that the Taft-Katsura Agreement was signed before the peace treaty between Russia and Japan (Treaty of Portsmouth), which was signed in August 1905, one month after the Taft-Katsura Agreement. Furthermore, the drafting of the Treaty of

Portsmouth occurred under the scrutiny of President Theodore Roosevelt and was therefore strongly influenced by the United States. In 1906 Roosevelt was awarded the Nobel Peace Prize for his mediation between Japan and Russia.

With all due respect to his achievement, Roosevelt must have realised, that the Treaty of Portsmouth was completely at the expense of the Korean Peninsula. Bearing the Taft-Katsura Agreement in mind, it is therefore hard to characterise the Treaty of Portsmouth as a fair one: The future of a sovereign Korea was not mentioned in any way; on the contrary, the destiny of Korea was guided by a complex netting of interests, delegating control over Korea to the hands of the Japanese.

After defeating China in 1895 and Russia in 1905, Japan became the major and most influential power on the Korean Peninsula. The Treaty of Portsmouth between Japan and Russia guaranteed Japan's interests on the Korean Peninsula and established its role as sovereign over the region. With this treaty not only the victory over Russia but also the Japanese control over the Korean Peninsula was sealed.

In historical retrospective, it was not only the United States who enabled Japan to gain full power over the Korean Peninsula. Many of the western governments also saw the possibility to combine a controlled Japanese colonialism with their own local interests by accepting the Japanese dominance on the Korean Peninsula and Manchuria [5]. The implementation of double standard contract systems between the parties was very useful. In the fighting of potential influence in the region and the protection of own interests, it was the western community as a whole who played a major part in strengthening the process of Japanese dominance on the Korean Peninsula.

In his book *Korea's Place in the Sun*, Bruce Cumings, an expert in Korean history voices on this:

> If Japan had a free hand, it also had a helping hand. It is a sad fact, but a fact, that almost every Westerner supported Japan's "modernizing role" in Korea [6].

In regard to the process of US-Korean relations, the Taft-Katsura Agreement and the doubtful role of the United States during the settlement of the Treaty of Portsmouth can be interpreted as the cornerstone for Korean reluctance toward the reliability of US foreign policy. With the signing of the Taft-Katsura Agreement, the United States and Japan came to a gentlemen-agreement that accelerated the loss of Korean sovereignty. This agreement gave Japan a free hand over the Korean Peninsula in exchange for American freedom of action in Hawaii and the Philippines. As a result of the Treaty of Portsmouth, Korea was under Japanese occupation for almost four decades [7].

Without going into historical details, there was hope for the Korean people to regain their full sovereignty towards the end of World War II. In August 1945, Japan was forced to surrender after the airdrop of atomic bombs on the cities of Hiroshima and Nagasaki [8]. The 'liberation' of the Korean Peninsula started by Soviet troops from the north and later by American troops from the south. The thirty-eighth parallel line became the line of demarcation between the two allies. But instead of becoming a free and sovereign country, the Korean Peninsula was once again put under pressure. This time, it was the upcoming rivalry between the two major world superpowers, the Soviet Union and the United States of America, which would shape Korea's history. Don Oberdorfer on this:

Thus Korea came to be divided into two "temporary" zones of occupation that, as the cold war deepened, became the sites of two antagonistic Korean regimes based on diametrically opposed principles and sponsors [9].

The political infiltration from the two so-called liberators in their sectors and the increasing radicalisation of Korean civil society and its leaders resulted in the division of the Peninsula into two sovereign states in 1948. The two Koreas, notably the Republic of Korea (ROK) and the Democratic People's Republic of Korea (DPRK), started their new life in dependence of their military and political protectors, the United States, the Soviet Union, the People's Republic of China and in a atmosphere of the growing tensions between East and West [10].

In this respect, the following war between North and South Korea cannot be described only as an inter-Korean war. Started in June 1950 by the military aggression from the North with the goal to reach reunification by force, it became clear very quickly that the reasons and developments of this war would be strongly characterised by the systemic confrontation between communism and capitalism. As Bruce Cumings stated, the war originated from multiple causes [11]. One of them, and clearly identifiable as a mistake on the part of the Americans, was the fact that after the liberation from Japanese occupation the United States took over most of the political and administrational structures established by the Japanese [12]. Therefore, many Koreans saw the US policy with critical eyes. This fact played a major role in North Korean agitation, blaming the United States as the same brand of imperialists as the Japanese, justifying the following war as one of liberation from the new imperialists.

Indications of the systemic confrontation where already noticeable before foreign military forces joined the war. The passing of a resolution by the United Nations Security Council on June 27th to condemn the North Korean aggression and to support military action to strike back was only made possible by the Soviet Union boycott towards the United Nations during that time [13]. After the multilateral troops of the United Nations under US leadership had pushed back the North Korean forces and entered North Korean territory up to the People's Republic of China's boarder, the total character of a representative war came out, when China joined the war in October 1950 [14]. From this point onwards it was obvious to everybody that this war was not only a result of the intra-Korean confrontation but also a consequence of the spreading systemic struggle between East and West.

The progress of the war is not part of this paper but it is important to mention that its course was characterised by disastrous military actions in every part of the peninsula. With the intervention of the People's Republic of China, the situation for the United States and its allies became increasingly difficult. With support from China, the North Korean troops reversed the situation and occupied southern territory again. As known today, the American fear to lose the war led to the US government consideration to use nuclear bombs again to prevent a communist victory over the whole Korean Peninsula. Those considerations arose particularly when communist troops from North Korea and China regained control over Seoul in December 1950.

In this discussion it was not quite clear whether the use of nuclear bombs should be provided as limited strikes against the People's Republic of China to stop their engagement or to the Korean Peninsula itself. The literature on these considerations and their circumstances

make it quite clear that the participants had no idea about the real consequences of such strikes [15].

Nevertheless there had been taken different actions by the United States to establish the capability to use nuclear weapons. Some of them were simulation tests of atomic bombings, undertaken by B-29 bombers flying over North Korea, in October 1951. Even if they used dummies instead of real nuclear bombs, Bruce Cumings pointed out correctly that

> one may imagine the steel nerves required of leaders in Pyongyang, observing a lone B-29 simulating the attack lines that had resulted in the devastation of Hiroshima and Nagasaki just five years earlier, each time unsure whether the bomb was real or a dummy [16].

That finally no nuclear weapons were used was mostly due to the fact that the war front was stabilised by the United States and its allies and that the Soviet Union did not enter the war.

Regarding the massive military use of air-bombing by the United States (including the use of napalm) it is quite obvious that not only the government in Pyongyang but also the North Korean population have no good memories of US foreign policy. Linking the US capability to use nuclear weapons in the Korean War and the present debate on the North Korean nuclear programme, Michael J. Mazarr stated that:

> The United States thus exposed North Korea, during its infancy as a nation, to the fearsome power and enormous political value of nuclear weapons. The lesson was apparently not lost on North Korea's leaders, and early U.S. nuclear threats are one important thread in the tapestry of the North's motives for a nuclear program [17].

The Hiroshima and Nagasaki bombs showed to the world that conflicts in the 20th century could be decided within seconds [18]. This experience and the possibility that those weapons could decide a war again left a deep impression on the North Korean government and its population. Furthermore the US foreign policy on the Korean Peninsula made it almost unnecessary for Pyongyang to spread the impression of a brutal and arrogant America: the behaviour of the United States spoke for itself. Until today, the sorrows of the Korean War have a special meaning to the North Korean resentments against the United States. With the American considerations about the use of nuclear force during the Korean War, the nuclear issue touched ground in this region for the first time.

The Korean War started with the goal of reunification by military force and ended with hundreds of thousand of deaths and a nearly totally devastated peninsula in July 1953. Since the end of the Korean War, the development on the Korean Peninsula passed a lot of critical situations. In the succeeding years, the ongoing Cold War seemed to make it impossible for the two Koreas to start a policy of conciliation and to smooth the way for reunification.

In February 1972, the then US President Richard Nixon visited the People's Republic of China and announced a new American foreign policy which contained an Sino-American alliance against Soviet dominance. This announcement was also described as the Nixon-Shock. The governments in Seoul and Tokyo where particularly astonished by this policy change. But

the fact that they hadn't been informed or consulted at any point before was much more offending than the policy change itself and equal to a loss of face [19].

As a result of the announcement, and due to their relations to the two parties (the United States and the People's Republic of China) North and South Korea where forced to react. This happened in the form of a common manifest between the two Koreas in July 1972. But after a short period of great hopes, it became clear that a lasting improvement in the inter-Korean relationship could only be achieved through diplomacy of mutual information and consultation and not with forced reactions as a result of unilateral political steps by one of the major powers in the region.

While the Republic of Korea became part of the western community and one of the major economic powers in the region during the upcoming years, the DPRK seemed to become totally isolated with the political changes in the early nineties. The decline of Soviet Union, the German reunification, the collapse of former 'brother-states' in Eastern-Europe, and the reform process in China, left deep uncertainty in North Korea's leadership.

Since the detection of the first indigenous North Korean reactor in the early eighties by US spy satellites, the attention of the world community has focused on the question of whether North Korea is using its nuclear facilities to produce military-grade nuclear material. In a decade where the loss of important economic partnerships and ongoing natural disasters has brought Pyongyang into a position where the government was not able to secure the nutrition of its own population, it was quite logical that North Korea used the uncertainty of the world community about the status of its nuclear programme to broaden its clearance in gaining economic support without losing political control over the country.

One step forward, two steps back

Although the problem seemed to have been solved in 1994 through the Agreed Framework between the United States and North Korea, the situation remains critical. The implementation and validity of the Framework was interrupted several times, and since George W. Bush junior took power in 2001 all the attempts forged during William Clinton's administration as well as under the sunshine policy of Kim Dae-Jung have evaporated. Disregarding its counter-productive meanings, the new government in Washington cancelled the existing roundtables with Pyongyang, announcing a policy review on North Korea for the next months.

The decision to cancel the talks with North Korea was again made without any arrangement. In January 2002, under the impression of the 9/11 attacks, George W. Bush called North Korea part of an 'axis of evil,' that supported terrorists and the spreading of weapons of mass destruction. The visit of the American diplomat James Kelly in October 2002 made the situation boil after he accused North Korea of keeping a secret military nuclear programme. When he returned to the United States, Kelly stated that the officials in Pyongyang confessed such a programme. Since then, the situation has deteriorated and the six-party talks between People's Republic of China, South Korea, North Korea, the United States of America, the Russian Federation and Japan, which started in August 2003 as a result of North Korea's withdrawal from the Nuclear Non-Proliferation Treaty, have shown little progress.

Washington made clear that it is not willing to engage with North Korea until Pyongyang's leadership stops its military nuclear programme. In case of new negotiations, the United States

would also like to discuss a broader agenda, referring not only to the nuclear issue, but also to the North Korean missile programme and some topics of human rights. North Korea, in contrast, is not willing to accept preconditions or to discuss different issues as a whole diplomatic package.

Meanings for the moment

From the North Korean point of view, the role of the United States as an imperialistic aggressor on the Korean Peninsula has never changed. With its faults in diplomatic behaviour it will be very difficult for the present US administration to re-open a direct channel with North Korea. Furthermore, with its policy towards Iraq, it must be clear for Washington that there is no reason for North Korea to trust US offers. Some observers have argued that Iraq was invaded by the United States only because it was not able to use the threat of nuclear weapons and that this provides a motive for North Korea to pursue a military nuclear programme.

As far as the missile issue is concerned, it is obvious that the monetary aspect is the major impulse for the programme. Selling missile technology is one of the few fields of North Korean industry that can ensure foreign exchange. It should also be clear that the ballistic missiles stationed in North Korea pose a serious threat to South Korea and in a certain way also to Japan. Beyond it, the lasting extension of the ballistic missile programme can also lead to disorientation in Beijing and Moscow. The question, whether North Korea is able to develop long-range ballistic missiles, which could threaten US territory, cannot be answered easily. It is fairly uncertain whether the North Koreans can master the difficult process of the electronic steering-control mechanisms of those missiles. So if there is in fact a threat to the United States, it affects the US soldiers stationed on the Korean Peninsula and Japan but not US homeland.

Unlike the missile issue, the impulses for the North Korean nuclear programme must be seen in a different context. Historically, the use of the atomic bomb in World War II most certainly impressed the North Korean leadership. The Cold War and its policy of nuclear deterrence could also have been a signal for North Korea that the possession of nuclear weapons prevents a foreign attack. As long as North Korea seemed to be protected by its allies (the People's Republic of China and the Soviet Union) there was no urgent need for North Korea to start a military nuclear programme of their own. But after the events of the early nineties, which led to the collapse of the iron curtain, the need to develop nuclear weapons came into the considerations of Pyongyang as a means to ensure its political survival. In contrast to the missile programme, the nuclear programme must be understood in its historical dimensions and should therefore be seen primarily as a tactical instrument. This follows from a general problem related to nuclear technology, namely, that programmes for civil benefits can be readily transformed into military projects (the so called problem of 'dual-use'). In this sense, it has for years been difficult to say whether the North Korean nuclear programme contained military use. Only inspections by a neutral side or disclosures from the North Korean side are cable of answering this question. The secluded policy of North Korea in that respect is well known. In September 2004, North Korea said it had turned plutonium from 8,000 spent fuel rods into nuclear weapons.

The invasion of Iraq has surely shown the North Korean leadership that the United States are willing to enforce their political ideas even if the purported rationale is not entirely

legitimated. The accusation that Iraq was in possession of biological and chemical weapons was not true, and to every expert who was informed about the work of the United Nations arms-inspectors in Iraq after the second Gulf War in 1991 it was clear before the invasion that the Iraqi threat as stated by Washington was not a realistic one but rather an overestimation. As a result of the US policy under George W. Bush, there have been no inspections in North Korean nuclear facilities since the diplomatic escalations of October 2002. It therefore lies within the responsibility of the global community – including the United States – to seek political measures which can solve the nuclear issue in North Korea. The historical burden of the United States on the Korean Peninsula and the political behavior of the present administration in Washington have an enormous impact on the fact that policy towards North Korea is failing on a continuous basis.

Conclusion

As I have tried to point out, a peaceful solution for the North Korean problem will probably not be found by waiting for regime collapse, regime change, or by forcing North Korea to one-sided reforms. The international community and especially the United States must accept that this policy will only lead to a further escalation of the situation and increase the possibility of military confrontation. The historical perspective shows that one-sided accusations for the situation, no matter in which direction, do not reflect the historical facts. The problem cannot be solved without a wide understanding of Korean history in general. For the future, it is important for the administration in Washington to realise that dealing with the Korean Peninsula in a responsible way means to consider the region's wider historical dimensions.

Notes

1. Richard N. Haass, Defining U.S. foreign policy in a post-post-cold war world, 22 April 2002, The 2002 Arthur Ross Lecture, Remarks to Foreign Policy Association. (http://www.state.gov/s/p/rem/9632.htm).
2. An excellent insight into Korean History and the beginning of the involvement of the world's community is provided by Angus Hamilton, Korea: Das Land des Morgenrots, London, 1904.
3. Don Oberdorfer, The Two Koreas: A Contemporary History, Indianapolis, 2001, p. 4.
4. With the US victory in the war against Spain in December 1898, the United States became protectors of Cuba, Guam, the Philippines and Hawaii. Since Theodore Roosevelt became President in 1901, the United States seemed to be more interested to consolidate its power in their new protectorates, than risking a struggle with Japan over Korea.
5. For example, Great Britain signed a treaty with Japan in 1902, wherein they acknowledged the special interests on the Korean Peninsula by the Japanese.
6. Bruce Cumings, Korea's Place in the Sun: A Modern History, New York, 1998, p. 142.
7. Even if the annexation-treaty between Japan and Korea was signed in 1910 it is quite clear, that the factual overtook of Korean policy by the Japanese came with the 'Treaty of Portsmouth' and the 'Taft-Katsura Agreement' in 1905.
8. In the historical perspective, the question, whether the drop of the atomic bomb was necessary from the military point of view, to defeat Japan, caused heated debates among experts. Today, it is common sense, that the drop of the bombs was more a political act to demonstrate military power, than a military necessity.

9. See [3, p. 7].

10. In October 1949, the People's Republic of China was founded by Mao Tse-Tung. The victory by the communist versus the nationalists in China was a political shock to the United States. Historically it was the logical consequence after the partnership of convenience between the Chinese communists and nationalists during the war against Japan from 1937 and 1945. With the capitulation of Japan this partnership became obsolete.

11. Regarding this fact, Bruce Cumings argues in his book Korea's Place in the Sun: A Modern History '… that civil wars do not start: they come' (p. 238).

12. In the north, the Japanese administration system has been totally destroyed by the soviets.

13. The boycott of the United Nations by the Soviet Union was a result of the soviet protest against the fact that the state of China was represented in the United Nations by the Chinese government in Taiwan and not by Beijing. The legality of the UN resolution was often criticised by the Soviet Union afterwards.

14. Officially, the Chinese fighters were declared as spontaneous units, so that there never has been an official war declaration from Beijing.

15. About the use of nuclear weapons on the Korean Peninsula and its impacts see Michael J. Mazarr, North Korea and the Bomb: A Case Study in Nonproliferation, Harrisonburg, 1997, pp. 15-34; Bruce Cumings, Korea's Place in the Sun: A Modern History, New York, 1998, pp. 288-298; and Roger Dingman, Atomic diplomacy during the Korean war, International Security 13 (1988/89, no. 3, Winter) 60-86.

16. See [6, p. 293].

17. Michael J. Mazarr, North Korea and the Bomb: A Case Study in Nonproliferation, Harrisonburg, 1997, p. 16.

18. Concerning the beginnings of the US nuclear policy see, e.g., Arjun Makhijani, Nuclear targeting: The first 60 years, Bulletin of the Atomic Scientists (2003, May/June) 60-65.

19. The visit was secretly prepared by the then special adviser Henry Kissinger. In regard to the discussion about the unilateral policy of the United States today, this period in world policy gives an excellent example that changes in US foreign policy have been almost made without arrangement.

The United States dealings with nuclear terrorism: cooperation from prevention

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Security experts agree that although unlikely, a nuclear terrorist attack is possible. Concerted efforts are needed in order to secure nuclear materials and nuclear weapons around the globe, particularly from 'countries of concern', in order to prevent their use by terrorist organisations. In this context, the US has a prime role to play as it may provide technical and logistical assistance to countries that are at risk of becoming the unwilling suppliers of fissile material to terrorist organisations. This article examines the possibilities of collaboration between the US and Pakistan in relation to the prevention of nuclear terrorism.

Since 1945 the world has been confronted with three major fears associated with the existence and possible use of nuclear weapons: a potential clash of superpowers during the Cold War era; the political and military peril of nuclear proliferation; and the threat of catastrophic nuclear accidents. Derived from the attacks of 9/11, the latest nuclear anxiety is the danger that sub-state groups will integrate nuclear terrorism into their strategic repertoire by getting hold of unsafe fissile materials or ready-made, black-marketed nuclear weapons [1].

Just like the nuclear countries, terrorists see the 'ultimate destructive power' [2] of nuclear weapons as an instrument for the attainment of their goals. Nuclear weapons are, in this sense, a realistic strategic option that these groups may recur to in order to push the US and its partners to accede to their demands which can range from the withdrawal of US support for Israel, the annexation of Kashmir by Pakistan, or the creation of Islamic governance systems (*Shariah*) around the world [3].

William C. Potter of the Center for Non proliferation Studies and Charles D. Ferguson argue that a nuclear terrorist attack is more likely to happen now than in any other time in the past. The rationale behind this statement lies in two basic premises [4]:

1. Non-state actors have emerged in the form of terrorist networks/organisations, which have the urge to use nuclear weapons for furthering their agendas.
2. Crude but real nuclear weapons, as distinct from radiological dispersal devices, are well within the technical reach of some terrorist organisations.

It is due to these realistic and almost tangible threats that nuclear non-proliferation has become 'the pre-eminent national security issue for the US'. The most prominent policy goal of the US is therefore to keep nuclear weapons, the know-how required for their construction, and the fissile materials that make them dangerous, out of the hands of those who could inflict harm on the country or one of its allies [5]. Thus, the current US strategy of non-proliferation with regards to the terrorist threat could be categorised along the following dimensions:

1. Securing nuclear materials and warheads at the sites where they are stored, a matter that could be termed the 'first line of defence'. [6]
2. Reducing the risk of proliferation or even of nuclear confrontations in South and Central Asia. [7]
3. Securing vulnerable Russian nuclear weapons. [8]
4. Improving protection of nuclear facilities within the US. [9]
5. Improving border and cargo monitoring at the frontier crossings and embarkation points most likely to be used by smugglers. [10]
6. Containing the spread of nuclear intelligence, defined as the know-how and material elements required to build a nuclear explosive device or even more cursory (yet sensitive) information that could give some group access to ready-made nuclear weapons. [11]
7. Preventing more states from acquiring nuclear weapons. [12]

Graham T. Allison has shown, in this sense, the inevitability of nuclear terrorism, arguing that this activity could pick up pace during the next decade. In order to prevent such inevitability, Allison has suggested that the 'thousands of unsecured weapons (soft ball size lumps of highly enriched uranium and weapons-grade plutonium) in Russia should be guarded from being stolen by criminals who could then sell them to terrorists deriving great economic gains' [13].

The US has forged a network of alliances with many countries as a measure to ward off terrorism after the attacks of 9/11. In this respect, the basic strategic goal of the US is to deploy a policy which makes 'prevention the highest priority' in 'countries of concern' [14]. North Korea, Iran, Iraq, Pakistan and Russia could be labeled as 'countries of concern' because of their undemocratic governments, the anti-Americanism that exists in some subgroups of their societies, and the existence of unsecured nuclear weapons or fissile materials which are vulnerable to thefts and may be diverted for their use in nuclear terrorist attacks. The focus of this paper will be limited to the case of Pakistan, a strong partner of the US in its 'war against terrorism', that nevertheless poses, due to its unstable situation and precarious socioeconomic structure, a high risk of being the source of black-marketed nuclear weapons and/or fissile materials. This paper will delve into the current US strategic cooperative efforts towards Pakistan in order to assess and fill any gaps that might exist in a foreign policy approach based on the US's 'first line of defence' rationale.

Defining nuclear terrorism

Nuclear terrorism is a term that is not restricted solely to the use by a terrorist organisation of an explosive nuclear device. According to Ferguson, nuclear terrorism in its broad definition includes actions such as [15]

- The seizure and detonation of an intact nuclear weapon.
- The theft or purchase of highly enriched uranium (HEU) or plutonium, leading to the fabrication and detonation of a crude nuclear weapon, or an improvised nuclear device (IND).
- Attacks against, and sabotage of, nuclear facilities, such as nuclear power plants, to try to cause the release of large amounts of radioactivity.
- The unauthorised acquisition of radioactive materials contributing to the construction and detonation of a radiological dispersion device, popularly known as a 'dirty bomb,' or a radiation emission device.

Nuclear terrorism involving the detonation of an (albeit primitive) nuclear device is not to be deemed a technically unachievable scenario. The simplicity of a gun-type weapon design makes it easier for a terrorist, given access to HEU, to engage in nuclear terrorism. A terrorist group could use, for instance, a commercial explosive to shoot two sub-critical masses of HEU into one another to 'form [the] supercritical mass needed to sustain an explosive chain reaction' [16]. Plutonium could likewise be used as a fissile element, though it implies a greater deal of technical challenges. Plutonium would have to be employed in the more technically sophisticated implosion-assembly method, which uses military-grade explosives and precision detonation electronics to squeeze the plutonium into a supercritical mass.

Al-Qaeda and the inevitability of nuclear terrorism

The probability of a nuclear terrorist attack has increased in the aftermath of 9/11. Security experts agree that although unlikely, a nuclear terrorist attack is possible. Several episodes in the contemporary history of nuclear proliferation unveil, in particular, al-Qaeda's clandestine efforts to get the bomb. As early as December 1998, Bin Laden showed great desires to acquire nuclear weapons for the mass killing of so-called 'infidels'. Bin Laden believes, it is said, that it is a religious duty to possess nuclear weapons and that were he not to follow this duty, he would be committing a sin [17]. Bin Laden tried to acquire nuclear materials as far back as in 1992 when he sought to forge relations with South Africa. Bin Laden was also alleged to have sought a deal with Chechen rebels in Russia to buy a nuclear war head [18].

The fact that, until now, Bin Laden's network has not recurred to a nuclear attack does not mean that such attack will not occur. Evidence shows that there is an important probability of a large-scale terrorist attack involving the use of nuclear weapons. In the aftermath of 9/11, Osama Bin Laden was reported to have said in an interview with the Pakistani news paper *Dawn* that if the US uses nuclear weapons on Osama Bin Laden groups and affiliates, he would attack the US with nuclear and/or chemical/biological weapons. In the same interview, Bin Laden also assured that he possessed weapons of mass destruction [19].

The statements issued by al-Qaeda before and after the 9/11 attacks are evidence of the intense hatred this network holds towards Americans. Graham Allison argues, in this sense,

that al-Qaeda would not miss any chance to kill and injure millions of Americans, since they believe that America's collaboration with 'the Jewish' 'is the cause of corruption and is responsible for the breakdown of values: moral, ideological, political and economic'. The poor state of Muslims in the contemporary world, according to their view, is due to America [20]. The document *Terrorist CBRN: Materials and Effects* produced in 2003 reports, for instance, that Islamist extremists linked to al-Qaeda leader Osama bin Laden 'have a wide variety of potential agents and delivery means to choose from for chemical, biological and radiological or nuclear (CBRN) attacks.' The goal of these terrorists would thus be to use CBRN to cause mass causalities. 'Attacks would be small scale, incorporating relatively crude delivery means and easily produced or obtained chemicals, toxins or radiological substances' [21].

However, many analysts and policy makers have argued that nuclear terrorism is not inevitable. Robin Frost argues that obtaining access to fissile material and consequently assembling an explosive device would prove to be a very difficult for a terrorist organisation. Frost does not limit the definition of terrorist organisations to al-Qaeda; he includes many other such organisations. These organisations draw their motivations from multifarious political, spiritual and historical events, like Aum Shinriko in Japan, the National Liberation Front of Nigeria, the Irish Republic Army, and other separatist organisations who could find 'hostage-taking, conventional bombings, shoot and run sniper attacks more feasible and cheaper to attain their terrorist motivations' [22].

Despite these criticisms, the sheer danger posed by the possibility of a nuclear-armed al-Qaeda makes focus on this organisation highly relevant. Even Frost has contended that al-Qaeda stands today as the most dangerous religious terrorist organisation [23]. Frost even concedes that al-Qaeda has attempted to acquire a nuclear weapon and is obsessed with killing American citizens.

Similarly, I argue that al-Qaeda believes in nuclear terrorism as an instrument that will allow this organisation to fulfil its goals (in particular, the assassination of Americans). Osama Bin Laden, leader of al-Qaeda, runs this organisation on the core beliefs of extremist political Islam, making it easier for these Sunni fundamentalists to renounce to their lives in the process of killing the 'infidels' in this world. After all, this belief contends, martyrs will be rewarded with 72 wives and a mansion of gold in the afterlife which, incidentally, is more important than earthly existence [24]. For Bin Laden and his followers, praying, marrying twelve wives, living in caves, crossing the snow-clad mountains of northern Kashmir and Afghanistan without the basic amenities of survival, fasting in Ramadan, or killing 'infidels' are all on the same level, all mere acts to make Allah content. The force of *Imaan* (belief in Arabic) could make them do anything. These extremist individuals, whether from Hizbollah or Jaish-e Mohammed, draw their motivations from the battles fought between Prophet Mohammed and the Jews of Medina in the 600 AD Battle of Badr, where Muslims were a small minority but overwhelmed their opponents. The battle of Karbala is also a mythical figure in the minds of Sunni fundamentalist terrorist groups, and although a defeat for Husyn, grandson of Prophet Mohammed, it is seen with reverence, extreme passion and devotion. Moreover, due to their beliefs in a Muslim brotherhood (based on the fear of Allah and giving one's life while pursuing *jehad* for saving Allah's religion), al-Qaeda deems it reasonable to use any means available, whether it be nuclear weapons or aeroplanes and buildings, for spreading Islam and killing the western 'Satan', i.e. the US [25].

Bin Laden wants to bring the 'rule of Allah' to the world, and is not inspired by any 'cult' or driven by the need to make his 'personality special or gifted' [26]. Bin Laden said in one of his sermons [27]:

> All these crimes and sins committed by the Americans are a clear declaration of war on Allah, his messenger, and Muslims. And *Ulema* have throughout Islamic history unanimously agreed that the *jihad* is an individual duty if the enemy destroys the Muslim countries. This was revealed by Imam Bin-Qadamah in *Al-Mughni*, Imam al-Kisa'i in *Al-Bada'i*, al-Qurtubi in his interpretation, and the Shaykh of al-Islam in his books, where he said: 'As for the fighting to repulse [an enemy], it is aimed at defending sanctity and religion, and it is a duty as agreed [by the ulema]. Nothing is more sacred than belief except repulsing an enemy who is attacking religion and life'.

The above mentioned evidence makes it clear that al-Qaeda is adamant to engage in nuclear terrorism.

Deterrence and nuclear terrorism

The traditional strategy that was used between states to prevent either the spread of nuclear weapons or their first use was that of deterrence. This concept, however, may fail in its applicability once it is extended to the domain of nuclear terrorism due to the mere fact that sub-state actors do not respond in the same way as a nation or a centralised bureaucratic system. Thus, in the literature, arguments have been made both for and against deterrence as a line of defence against nuclear terrorism.

The main position in the literature argues that deterrence, defined as threatening an enemy with assured destruction, cannot work effectively against non-state actors, i.e. the terrorists. Deterrence, in this view, is only viable for enemies having a territorial reality [28].

However, Micheal A. Levi [29] argues that 'with a little technological innovation, deterrence can become a useful strategy against terrorist use of nuclear weapons'. Given that nuclear terrorism depends on the existence of a state-based source of either active weapons or basic fissile materials, deterrence could work under the guarantee of massive retaliation against countries involved in the promotion and/or sponsorship of terrorism: 'those rogue states who are caught secretly or overtly providing nuclear materials and weapons to terrorists' and who could consequently be threatened with complete nuclear retaliation in the form of a inter-state confrontation (although the legality of this issue is left open to questioning). Levi thus argue that

> [B]uilding on scientific techniques developed during the Cold War, the United States stands a good chance of developing the tools needed to attribute terrorist nuclear attacks to their state sponsors. If it can put those tools in place and let its enemies know of their existence, deterrence could become one of the most valuable tools in the war on terror.

I concur with Levi, insofar as deterrence can be used as a measure against nuclear terrorism. Once the links of the rogue states with terrorists are unveiled, massive retaliation could be used

destroy such links: focus should be on breaking the links of terrorist with any states/non state actors transferring fissile material.

The US and Pakistan

The history of the US-Pakistan relationship is chequered. Sometimes Pakistan has been the US's most favoured ally and sometimes a troublesome friend. Now, Pakistan represents three things to the US; 'a staunch ally', 'a threat' and a 'troublesome friend'.

For instance, Pakistan is termed as the most favoured non-NATO ally by the US (specifically by the administration of President George W. Bush and in reference to its role in the war against nuclear terrorism.) This position has been cemented by the work of Pervez Musharraf, President of Pakistan; he is often referred to by anti-American elements within the country as 'Busharf' due to his strong pro-American leanings [30]. On the other hand, after the A. Q. Khan nuclear black market network was exposed in 2004, Pakistan also came to symbolise a 'hub of terrorists', remaining as a great concern for the international community. The doubtful ability to secure loose nuclear materials in Pakistan is, in this sense, one of the sources of anxiety. In particular, there is a fear that followers of al-Qaeda holding major posts in the Pakistani army and the Inter Services Intelligence Agencies might choose to divert nuclear weapons to their parent organisation [31].

President Musharraf has reiterated that nuclear command and control in Pakistan is securely delegated and that nuclear materials are secure and protected from terrorist elements. However, it has been argued that this false 'expressed belief' of Musharraf poses a major problem in securing nuclear material from the twisted ideologies of terrorists [32].

Nuclear command and control in Pakistan

Command, Control, Communication and Intelligence Systems (C3I) are the arrangements of facilities, personnel, procedures and means of information acquisition, processing and dissemination used by a commander in planning, directing and controlling military operations [33]. Safe and reliable C3I systems are thus a prerequisite in preventing access to nuclear materials.

There are many features of the existing Command and Control (CC) system in Pakistan which deviate from the typical US-USSR model. Pakistani policy makers contend that 'the issues relating to the nuclear [CC] in the Indo-Pakistani context are different in nature from those of the Cold War Model. The geographical proximity of the two countries, the asymmetry in conventional forces, and the low strategic warning times are factors that demand highly efficient and reliable CC executed by their respective decision making authorities. The absolute failsafe CC is not likely to be achieved by either side in near future; indeed, such an ideal was perhaps not even achieved by the US or the USSR. Thus, an 'always/never' dilemma will continue to be part of the risk calculus for accidental or unauthorised use of nuclear weapons on both sides' [34].

Khalid Banuri of the Pakistani Strategic Plans Division elaborates that 'Pakistan has established an effective and reliable National Command Authority (NCA) that is at the apex of a decision-making body under the chairmanship of the President, with the Prime Minister as its Vice-Chairman.' This system consists of an Employment Control Committee and Development Control Committee as well as of a Strategic Plans Division (SPD) which acts as its Secretariat, and a Strategic Force Commands with clearly defined functions. The operational

control of all strategic assets in Pakistan rests directly with the NCA through the SPD which has, on ground, a very elaborate and layered security structure under a Director General Security, reporting directly to the Director of SPD [35].

Pakistan has also taken steps towards the evolution of its export-control legislation, now approved by the Cabinet and under revision within the Parliament. This legislation lays down strict export-control measures and will take stringent actions for any attempt or violation of export-control laws.

Pakistan furthermore has a rigorous screening for human reliability at various levels of access to nuclear materials. Likewise, Pakistan is open to outside assistance, the overarching principle being, however, non-intrusiveness [36].

In particular, it is Pakistan's Strategic Plans Division which looks after the security of nuclear materials and facilities. Other measures taken by Pakistan to secure its nuclear materials include:

- The introduction of domestic legislation to tighten controls on nuclear-related exports
- The improvement of physical security at sensitive facilities
- The strengthening of the personnel reliability system
- The relocation of nuclear materials and weapons to more secure locations, and
- The removal of individuals involved in the nuclear black market from their posts within the nuclear establishment [37].

No to sanctions – yes to economic help

Ferguson has argued that certain countries who have terrorist cells, like Pakistan, should be penalised [38]. However, while refuting Ferguson, Touqir has argued that any kind of American sanctions towards Pakistan would not be a good tool to combat terrorism for they would have overall debilitating effects [39]. Sanctions would 'squeeze Pakistan economically, giving rise to more extremist elements. Resource-starved sectors such as health care, education and correctional services should be stimulated so that more jobs, better education and health services are provided to the marginalised populations. In this sense, the focus of attention should not be on the sanctioning of a nation-state (i.e. Pakistan), but rather the recognition that unemployed youth facing severe economic challenges, for instance, are attracted by extremist organisations are therefore candidates to become suicide bombers.

The US has to forge a policy towards Pakistan which plucks out the root causes of terrorism following an approach different from that of sanctions and diplomatic retaliations. As in the past, the US should help Pakistan both economically and socially.

The United States should not suffer from any political myopia while reviewing its economic policies towards Pakistan. The US has to commence its anti-terrorist fight by educating both the civilian and military populations: an implementation of social and educational reforms is essential. In addition, the US should help India and Pakistan to build peace and pursue complete disarmament, so that the ambitions of nuclear terrorists are nipped at their base [40].

The US and Pakistan have cooperated with each other to root out the menace of terrorism in the past, so actions of this type are not without some sort of precedence. For instance,

within the three years that followed the 9/11 attacks, the US gave economic aid to Pakistan in the order of $1 billion, and wrote off $1 billion in debt. In June 2003, the US announced it would give a $3 billion aid package to Pakistan to be distributed over five years. This aid is aimed at assisting the (traditional) economic and security sectors. A framework agreement on trade and investment has also been signed between these two countries, including a $1.2 billion arms-sales package that includes the sale of P3 Orion aircrafts. The United States has also reinstated a military-training programme through which some three hundred officers have received instruction at American military institutions since 2001. Pakistan-US relations are not limited only to this kind of military intelligence relationship but extend further [41].

Curtailing anti Americanism

US economic assistance towards Pakistan could be used to curtail anti-Americanism. The traditional Pakistani army has been inculcated with doctrines imbedded with a deep hatred for Jews and Hindus [42]. A strategic reorientation of the Pakistani army's thinking is needed to pave the way for the evolution of liberal-minded officers who are tilted more towards US interests than those of Osama Bin Laden [43].

Broader reforms in Pakistan are central to combating terrorism of all kinds. For many years, political parties and governments used the goad of anti-Americanism to win public support and to divert attention away from festering domestic issues. Now the very same anti-Americanism is being used by extreme Islamists. Both the Pakistani and US governments should cooperate to root out hatred towards the US amongst Pakistani civil and political elites as well as within the larger population via, for instance, media campaigns and education [44].

India-Pakistan rivalry and nuclear security

The rivalry between India and Pakistan enhances the risk of nuclear material from being diverted into terrorist activities. The 'new peace' between India and Pakistan could bolster this aspect of security in the region, in direct benefit to the US and its allies [45].

Pakistan's first-use policy and inferiority in conventional weapons *vis à vis* India have given it strong incentives for the deployment of its nuclear arsenal, raising concerns in the US policy-making elite, and forcing them to work even harder to provide assistance on detection technologies to Pakistan

So far India and Pakistan have participated in nuclear-threat reduction measures. They have signed or acceded to regional cooperative agreements containing disarmament components; and have participated in IAEA nuclear safety and security training courses [46].

'Both countries are also required to provide the highest standards of security for fissile material under UN Resolution 1540, and as members of the Convention on Physical Protection of Nuclear Materials' [47]. Although India and Pakistan have taken measures to secure their nuclear stockpiles, they have done so on their own terms and have not provided concrete evidence to the international community that their nuclear storage facilities are not vulnerable. Their national sovereignty overwhelms nuclear security measures. Both countries are suspicious about any intrusive act of the IAEA.

The US could encourage Pakistan to become more cooperative and transparent about its nuclear programme, without compromising its national interests. Unlike Russia, Pakistan is not likely to allow any US nuclear experts or laboratory specialists in its nuclear facilities, even if it

were part of an upgrade in security. In the future, Pakistan cannot be expected to dismantle its nuclear establishment, 'closing down facilities and blending down fissile materials' [48].

While looking for a cooperative deal with Pakistan, the US should embark on the development of a 'not-so-hyper' intrusive tool to safeguard fissile material that keeps in view Pakistan's national security interests and sensitivities related to sovereignty [49].

The US should pave the way for bilateral dialogue on the possible 'menu' of low-intrusive tools, for both civilian and military sites where nuclear material is stored, that could be further adopted and implemented by Pakistan unilaterally. Other cooperative measures could be as follows [50]:

> training programs, exchanges of best practices, and steps to strengthen the security culture in all nuclear-related institutions. Organisational links, such as lab-to-lab relations and scientific exchanges, could also be explored. Dialogue might need to begin by addressing the outsider threat (guard training, fences, cameras, equipment, et cetera) because the insider threat is more sensitive and touches on broader internal issues that will be more difficult to address without a certain level of trust. It may also be possible to provide uncontroversial and non intrusive up-to-date technology that is not nuclear specific, including surveillance monitoring and physical access controls.

Some more steps proposed in the literature go as follows:

- ensuring that personnel reliability systems are as up-to-date and efficient as possible
- updating physical security standards at all nuclear facilities and for weapons, weapon components and materials, including barriers and perimeters, surveillance, and access control techniques
- strengthening the security of radioactive material held by non-state agencies
- ensuring effective planning for dealing with emergencies and response procedures
- ensuring effective control and accounting for weapons, weapon components, and materials
- reviewing the most likely threats and designing protection that ensures a high level of security, and
- discussing stringent export control law implementation.

The 2001 visit by Secretary of State Collin Powel initiated a bilateral dialogue between the US and Pakistan to talk about nuclear security. They were called the 'non intrusive and non sensitive expert-level' discussions. The scope of the discussion extends from 'export and commodity controls to personnel reliability programs, nuclear material protection, control and accounting, transportation security, knowledge exchanges, and training'. Progress on these dialogues is successful [51].

PAL *assistance to Pakistan under cooperative threat reduction measures*

Permissive Action Links, or PALs, are a technology integrated into nuclear weapons to force any potential user to enter an authorisation code before the weapon can be armed. The combined features in PAL mean that any group that were able to obtain one of Pakistan's

weapons would encounter great difficulty in arming or using the device. PAL deals with securing nuclear weapons and not the underlying nuclear material. Securing nuclear material and nuclear weapons are two different things.

Cooperative Threat Reduction Measures (CTRM), on the other hand, are a cooperative assistance program offered by the US to countries like Russia who are signatories of the Non-Proliferation Treaty (NPT) for securing nuclear materials and arsenal.

There are various kinds of constraints faced by the US for the application of CTRM in Pakistan. For instance, international legal constraints make it difficult for the US to provide any kind of technology to Pakistan, which is (in the framework of the NPT) a non-nuclear state. US domestic laws have 'incorporated significant non proliferation requirements' which also make it difficult to cooperate with Pakistan. For instance Atomic Energy Act requires that states receiving US original nuclear material should not transfer it to anyone, putting this technology under tight security. The act also needs and Agreement of Cooperation before any technology is transferred, and currently, the US and Pakistan do not have such an agreement. There are also technical limitations for the US to provide nuclear securing technology to Pakistan, namely, because of its very secretly guarded nuclear weapons programme. Knowledge about Pakistani nuclear weapons is inadequate, posing a technical hurdle for the US since there is great uncertainty as to what they would be dealing with. However, it is desirable that the United States 'offer security assistance [to Pakistan] that includes generic physical security procedures, unclassified military handbooks, portal control equipment, sophisticated vaults and access doors, and personnel reliability programs' [52].

Conclusion

Al-Qaeda's core philosophy is to bring mass deaths to Americans and to bring 'Allah's rule' around the world. Bin Laden's network believes they could only be successful if they 'bring death to the US'. This destructive goal requires powerful weapons and nuclear weapons seem a viable option to achieve their end. Concerted efforts are needed with the help of the US to secure nuclear materials and nuclear weapons around the globe particularly from countries of concern, thus denying al-Qaeda any access. Pakistan's factional infighting within the Pakistani Army could put a dangerous question mark over the command and control of Islamabad's nuclear material and weapons. Similarly, a wider civil war in Pakistan could jeopardise the safety and security of its fissile material stocks and nuclear installations. A few assassination attempts on President Musharraf in 2003 and 2004 are examples of militants trying to oust him from the leadership of Pakistan. This reality has added more to the insecurity of Pakistani nuclear material. Although the US has cooperated with Pakistan in some quarters for the security and safety of nuclear related issues, America's own domestic laws, the Nuclear Non-Proliferation Treaty, the sensitive nature of Pakistani nuclear arsenal, the India-Pakistan nuclear rivalry and the lack of confidence-building measures between these two nations, illiteracy and anti-Americanism in Pakistan, remain hurdles preventing the US to forge true cooperation for the security of nuclear weapons and materials in Pakistan. Cooperative Threat Reduction Measures, which are currently applicable to Russia, should be made globally accessible to prevent nuclear terrorism at its roots.

Notes

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Future ethical challenges in biology

Thoughts from the UK Student/Young Pugwash symposium on
bioethics, Imperial College, London, May 2005

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In recent times, the life sciences have gone through a rapid growth and development fuelled by
successes such as the sequencing of the human genome, the discovery of stem cells and their
possible benefits in healthcare, and the advent of cloning technologies. The beginning of the
21st century is fast becoming the 'bio' era. This rapid technological and scientific development
of the biosciences has parallels with the nuclear age. The unlocking of the secrets of the atom
led to innovation and development in the field of nuclear physics. Nuclear power stations were
to make power cheap for everyone and radiation would be used to cure us of our cancers.
However, as Pugwashites, we know that the nuclear revolution was used in more nefarious
ways with the design of nuclear weapons and their subsequent use in Second World War.
Similarly, new technologies in the biosciences have the potential to be used irresponsibly. The
following sections outline some of the areas for concern. However, most importantly of all, I
think we are in a position to learn from what has taken place before and we must now try to
pre-empt problems arising from the misuse of science.

The dangers of new reproductive technologies.

The clashes of culture in scientific endeavour, between what is scientifically possible and what
is deemed to be 'ethically and morally' correct, are exemplified by the developments of new
reproductive technologies such as in-vitro fertilisation, and pre-implantation genetic diagnosis.
In-vitro fertilisation (IVF) is the technique for conception of a human embryo outside the
mother's body and is one of the methods used to help people with fertility problems to
conceive. In this technique, several ova, or eggs are removed from the mother's body and
combined with sperm from the father in a dish containing a nutrient medium; they are then
cultured in an incubator. Upon successful fertilisation of the egg by a sperm, the fertilised egg
is allowed to grow for several cell divisions and the resultant embryo is either transferred to the
mother's (or a surrogate mother's) body for normal development in the uterus or frozen for
later implantation. These frozen embryos are kept in liquid nitrogen and may be transferred to
the uterus at a later date if the mother fails to conceive during the first cycle, or if after
successfully becoming pregnant she wishes to try for another child in the future.

The first 'test-tube baby' was born in 1978, and by 2000 over 50,000 such babies had been born the UK. According to the National Health Service (NHS), the publicly-funded healthcare system in the UK, 6,000 babies are currently born as a result of IVF each year in the UK [1].

A major complication surrounding IVF treatment is the increased chance of multiple births occurring due to several embryos being implanted at once to increase chances of a successful pregnancy. Women who become pregnant through IVF have a 25-30% chance of having twins, compared to 1 in 90 of the general population [2]. Multiple births lead to increased risk to the babies and the mother because there is a higher chance of stillbirth, miscarriage, and premature delivery. Welfare and financial implications may also arise due to the parents having to provide for more than one child.

Due to improvements in the technique, implanted embryos are more likely to come to term than in the past. Accordingly, since March 2004, regulations stipulate that a maximum of two embryos can be implanted in women under 40. Women over 40 may have a maximum of 3, as they have a smaller chance of conceiving [3]. This is the case in the UK but we are unaware if there are similar limits imposed in other countries. In those where the technique is less developed, there may not be limits on the number of embryos implanted at one time.

Recent cases have arisen where women in their fifties and sixties have become pregnant through IVF. Although the menopause sets a natural barrier to conception it has been possible to implant an embryo into the womb if the woman has taken special hormones. The women are surrogate mothers and not genetically related to the child they give birth to. In January 2005, a 66 year old woman from Romania became the oldest recorded mother after undergoing fertility treatment for 9 months. Both the ovum and sperm came from anonymous donors [4]. In 2003 a 65 year old Indian woman gave birth to a baby boy.

These cases, and the likelihood of them becoming increasingly common in the future, raise several important questions. How is the welfare of a child affected by being brought up by elderly parents who may have less physical energy to invest in them? The welfare of the parents is also at stake, because although the baby comes as a blessing, the effort that is required in bringing up young children is high. The psychological effects on the child of not being genetically related to their birth mother and unable to find out the identity of their genetic mother and father should also be investigated [5].

Should IVF be available with public money? How should public funds be invested – is IVF a more pressing need than, say, research into cancer? According to the NHS the typical cost of one IVF cycle at a private clinic is £2,000 but from April 2005 it says that Primary Care Trusts should be offering at least one cycle of IVF treatment on the NHS to infertile couples. Women must be aged between 23 and 39 to qualify for free treatment. In addition, they must either have been unable to conceive for three years despite regular intercourse and no identifiable problem or have a specific problem such as absence of sperm or blocked fallopian tubes. The National Institute for Clinical Excellence (NICE) recommends that three free cycles of IVF should be offered, but a timescale for implementing these guidelines has not yet been announced [6]. If the treatment is not free or is limited, then the technique will only be available to the rich, and not to those who can't afford it. This leads to a further question, namely whether genetic parenthood is such a fundamental human need that individuals can demand public funding of treatment.

It seems that although IVF treatments are becoming a standard procedure, there are still debates and ethical issues to be addressed.

One step on from IVF

IVF therapy has laid the foundations for more advanced interventions. By culturing the embryo for a time outside of the uterus, that embryo can be observed microscopically for any gross anatomical defect and, using modern genetic tests, more detailed characterisation of the embryo can be undertaken before implantation. These developments have produced the technique of pre-implantation genetic diagnosis (PGD). PGD is a procedure that allows for an embryo that has been created in vitro to be screened for a number of genetic disorders prior to implantation into the uterus. The embryos undergo a biopsy procedure in which one or two cells are removed and tested for the specific disorder either by looking at the structure of the chromosomes in the cell or by extracting the DNA from the cell and looking for specific mutations in their genes. If the cells are determined to be unaffected, the embryo from which they came can be implanted into the mother's uterus; if, on the other hand, they are found to be carrying a disease, the embryos are not implanted and are subsequently destroyed. This introduces selection on the basis of genetic phenotype. Selection of embryos has always been a part of IVF treatments in that embryos are examined under the microscope and only those that appear anatomically normal are used, as embryos that appear abnormal are unlikely to implant and produce a child. PGD is an extension of this selection from an anatomic level to a genetic level.

Pre-implantation genetic diagnosis is used in cases where the parents know that they are at risk of passing on a serious genetic disease on to the child. The Human Fertilisation and Embryology Authority (HFEA) in the UK currently licences PGD of cystic fibrosis, haemophilia, beta -thalessaaemia, sickle cell disease and Huntington's amongst others [7]. These diseases are characterised by a very high penetrance (the genetic defect leads to disease in almost all cases) and a severe phenotype often resulting in death. In addition, this high penetrance is due to a small number of mutations whose genetic interactions are relatively simple. Simply put, very closely defined changes in the genome lead to disease. Most genetic interactions are more complicated than this and while it is indeed possible to diagnose certain disorders such as Huntington's, for many other common genetic diseases the complex genetic interactions are less well understood. While the severity of the disease may still be high, the penetrance of any given mutation may be lower and so when screened a given embryo will have a percentage chance of resulting in a diseased child. This raises the question: At what level of probability should an embryo be discarded, if at all, if it is in danger of suffering from a debilitating disease at some point in its life? For many disorders it may be possible to diagnose the probability of contraction but the age of onset and severity may not be so clear.

While PGD is not a commonly used technology (during the 1990s in the UK, 900 children were tested) we must consider the societal impacts of PGD, if it were to become more commonplace and the range of disorders diagnosed for was to increase. While the desire for a healthy child is understandable, the possibility must be addressed that as the technology becomes more advanced the criteria for a 'healthy' child may change. A fear is that compassion for diversity will decline as it becomes possible to ensure your child is free from genetic disease. The risk is that the technology will become so normalised that society is pushed into a certain set of beliefs. With so many potentially conflicting interests – parents, disability awareness groups, right-to-life groups - the ethical situation becomes increasingly complex. While PGD procedures are comprehensibly legislated for in the UK and available only for a few

medical conditions, already people have sought this procedure abroad. Could this be the beginning of 'genetic tourism'?

The genetic tests used in PGD are not limited to use in the IVF situation. Prenatal diagnosis can be used to determine the disease status during pregnancy. The methods for prenatal diagnosis include ultrasound imaging, chorionic villus sampling (CVS) and amniocentesis. Ultrasound imaging, in a similar way to the microscopic examination of embryos before implantation in IVF, examines the foetus for gross abnormalities. CVS involves analysing a tiny tissue sample from outside the foetal sac and amniocentesis involves taking a small sample of amniotic fluid. These samples can then be tested for genetic and chromosomal abnormalities as described in PGD. CVS and amniocentesis are not routinely offered to all pregnant women as it carries a small risk of miscarriage but may be offered to parents who have a high risk of passing on a genetic disease to their child, or when the mother's age may be a risk factor [8]. Currently in the UK, if it is discovered that there is a genetic disease, then the pregnancy may be terminated. In addition, if there is risk of a severe disability, then a termination can be carried out after the 24 weeks mark that is the usual abortion limit in the UK.

By testing the embryo in the womb, the selection choice is not asking should this embryo be implanted or not, as in PGD, but rather do we terminate this existing implanted embryo.

Selection on the basis of gender

Technologies such as PGD and prenatal diagnosis are used to produce children free from a given genetic disease. However, selection on the basis of sex is also possible and in fact is commonplace in India and China where unborn female babies are aborted simply on account of their sex. This has led in India to a nationwide ratio of 933 women for every 1000 men and in Delhi, where the practice is prevalent, to a ratio of 814 females to every 1000 males (the world average of male-to-female ratio is 1000 males for every 1036 females) [9]. Although a law has come into force that makes it illegal to use ultrasound examinations for sex determination, the practice continues, albeit underground. Doctors who disclose such information are punishable by suspension but also stand to gain by, in some cases substantial, under-the-table fees from the expectant parents. No case has yet been brought to court and it has been argued that the medical fraternity is not sufficiently regulated and the law is impossible to enforce.

UNICEF has warned of some of the social impacts of this practice – gaps in the workforce, men unable to find brides and an increase in the trafficking of women. A preference for boys over girls can be explained by India's dowry tradition which makes having a girl an expensive burden for poor families. But the problem has not disappeared even in Delhi's prospering suburbs and continues despite growing affluence.

Sex selection is currently illegal in the UK. Termination on the basis of sex, and selection of an IVF embryo to be implanted solely on the basis of gender are illegal, unless the child will suffer from certain sex-linked illness's. It is also illegal to carry out procedures such as 'sperm sorting' which increase the probability of one sex being conceived over another during fertility treatment. This has upset a small number of parents who wish to use this treatment for 'family balance'. In the US these treatments are available, however most clinics insist that you already have one child of the opposite gender before carrying out the procedure. While the expense of

these treatments mean it is unlikely to become a universal method for sex selection, the potential for gender-imbalance such as in India cannot be ignored.

The increasing possibilities in reproduction made possible by the technologies outlined above are creating new ethical and moral challenges not only for prospective parents and the counsellors advising them, but also for society as a whole. It goes to the heart of societies' conceptions of what is seen as 'healthy', 'normal', a 'balanced family' and may bring social pressure to conform to this norm and decreased acceptance of difference, because technology has made it possible. Those who provide genetic counselling have been depicted as contemporary eugenicists by encouraging practices that result in the termination of foetuses with disabilities. By supporting the choice of the patient, they have been perceived as discriminating against people with disabilities and have been labelled as 'playing God' and turning children into consumer goods.

Issues surrounding the derivation of stem cells

Recent advances in biology have created many possibilities for novel treatments for disease and leading the way in these new technologies are stem cells. The usefulness of stem cells lies in the fact that they are undifferentiated cells with the ability both to multiply and to differentiate into specific kinds of cells. Tissues in the human body are being continually turned over; for example red blood cells have a lifespan of only 120 days. New cells need to be produced and this is the job of the stem cell. New red blood cells are produced in bone marrow from specific stem cells; these cells divide many times, then mature into blood cells. Similarly there are stem cells in the skin which continually produce new layers of skin to replace the old skin as it is lost.

The property of stem cells to divide and differentiate into many different tissues is what is so unique. In the case of stem cells in bone marrow, a stem cell can become either a red blood cell or one of many different types of white blood cell depending on the signals that it receives. Such a stem cell is said to be multipotent, that is that it has multiple possible destinations within some constraints (i.e., 'bone marrow stem cells do not want to produce skin'). Other stem cells are not constrained at all and can become any type of cell given the correct signals. These cells are found in the early stage of life shortly after fertilization when the embryo contains only a few cells which must go on to produce the whole array of cells in a fully developed organism. These cells are known as totipotent stem cells.

From a biomedical point of view, stem cells hold the promise of enabling scientists to grow specialized cells or tissues, which could then be used to treat injuries or disease. For example, diabetes can be caused by the loss of insulin producing cells in the pancreas. Stem cell therapy could one day produce new pancreatic cells which when injected into the patient would give normal insulin production, thereby curing the diabetes. Other possible treatments include using stem cells to produce new nerve tissue which could be used to repair damage from spinal injury possibly reversing serious paralysis.

However, stem cell research is controversial because the best source of totipotent stem cells is human fetal tissue. By harvesting stem cells, the embryo is destroyed and many see this as morally problematic. Efforts are underway to try to turn multipotent stem cells into totipotent cells by removing the constraints put on the multipotent cells. This would negate the

need for embryonic stem cells and while progress in this area is being made, the current consensus seems to be that embryonic stem cells are the most promising.

Embryonic material to produce stem cells is available from several sources, each having its own ethical concerns. Stem cells can be harvested from aborted fetuses. This is seen as sanctioning the act of abortion and ties in stem cells with the controversy surrounding abortion.

Surplus embryos that are a consequence of the *in vitro* fertilisation technologies mentioned previously can be used to derive embryonic stem cells. Ethical concerns centre on the status of the embryo itself and the controversial issue of how much respect should be given to a human embryo. On one side, the embryo is viewed as a genetically human and a potential person and therefore should be granted protection. On the other side of the argument, while the embryo may be genetically human, in the early stages of development it does not possess any of the characteristics of being human; rather it is a simple cluster of cells and hence should not be given an independent ethical status. There are numerous compromises between these two views suggesting that although in the early stages of life the embryo is not a person, it is to be respected and given a degree of protection as befits the starting point of a human life. It is a prerequisite that IVF clinics may only use spare embryos for research work if the embryo donors have given their informed consent.

Embryos can be created from donated eggs and sperm solely for the purpose of extracting stem cells. Again the same issues regarding the ethical position towards the embryo are raised here as was the case for spare embryos from IVF treatment, along with new concerns over the deliberate creation of an embryo in order for it to be ultimately destroyed. Spare embryos from IVF therapy were created with the intention to produce a child but were not used and would therefore be discarded. It could be argued that this is ethically a stronger position to use spare embryos destined to be destroyed rather than creating new embryos which do not have the chance to become a child but are simply to be used produce stem cells. However, it can also be argued that creating embryos with the sole aim of deriving stem cells is less of an ethical problem precisely because the embryos are not created to be implanted in a woman and so are not intended to produce children.

While stem cells for research purposes can be generated in the three ways described above, any treatments developed from them will face the problem of immune rejection by the patient. In a similar way in which organ transplants are rejected by the recipient's body, stem cells injected into a patient will be treated as foreign by the immune system and attacked. Patients will have to be treated with drugs to suppress the immune system from attacking the stem cells. However, there is the possibility to get around this problem by producing stem cells using cloning technologies. In order for the patient's body not to reject the stem cell therapy, the cells need to be identical to the patient's cells. This can be achieved by replacing the genetic material from an egg cell with the patients cell's DNA and producing an embryo from the egg. The embryo will then have exactly the same genes as the patient, i.e. will be a clone of that individual and stem cells derived from that embryo should be tolerated by the immune system without the need for powerful and potentially dangerous immunosuppressive drugs.

This technology is faced with the same ethical issue of creating an embryo, simply to be destroyed as was the case for creating embryos for research using donated sperm and eggs. There is the consideration that this process if used, once therapies are developed, for personal

betterment, i.e. a woman donates her own eggs to produce an embryo to cure her own diabetes, then it is a personal matter akin to donating a kidney.

The ethics of biomedical research

Ethics is generally defined as that branch of the study of value and quality in philosophy that deals with the nature of morality. Thus, it has to do with defining what is right and wrong. There is no universally applicable and objectively determinable 'right' and 'wrong'. What is deemed right and wrong in a society is 'negotiated' over time by the members of that society. Culture thus plays an important role. Not all members have equal power to influence these 'negotiations' of what is to be considered right and wrong, but in most societies there is an attempt to balance the interests of the 'stakeholders' in an issue. In the case of bioethics – concerned with what is right and wrong (i.e. moral) when it comes to bioscience and technology- stakeholders can be identified on several levels.

At the *individual level* we identify the individual who benefits or suffers from biomedical related issues, the doctor/health worker who administers or has to make decisions related to biomedical issues and the scientist who do research. These actors/stakeholders have needs, rights, interests and responsibilities. Some would argue the unborn child should also be considered as a stakeholder with rights.

At the *societal level*, we identify groups in society affected by these issues or feeling that they have a stake in these issues, such as religious groups or groups with disabilities who mobilize around their collective interests. We also identify the category 'society as a whole', for example, bearing the economic cost of IVF. On this level, issues relating to the conception of society or future impacts on the development of society, often arise. Is PGD a step in the direction of designer babies and what would be the impact on society.

The *national level* often corresponds with 'society as a whole', but involves the state or government and therefore refers to the level on which policy is made. Laws regulate the biosciences and technologies. Policies are plans of action to execute legislation. When policy programs are designed, they take as sub-text the recognition that budgetary resources are finite and that socio-economic imperatives are generally in competition. Money spent on IVF, for example, cannot be spent on malaria research.

At the *international/global level*, we look beyond a narrowly conceived society (e.g. a nation-state) to other societies as well. In an era of increased globalization (through travel, information technology, research exchanges etc.) biomedical questions cross state borders in diverse ways, whether through bio-medical tourism, international negotiations of a bio-ethics framework, and issues about intellectual property rights in biotechnologies that may benefit one society (nation) at the expense of another.

Controversies develop between the interests and responsibilities of actors on the various levels. Most notably the question arises: which of these levels is the most appropriate one to make decisions about biomedicine? Should individuals be allowed to make decisions about PGD or should societal groups' interests be considered too? Is it possible to identify norms on the international level established enough to sustain an international framework of bioethics or would societies be more inclined to govern biomedical choices within their borders as currently the case?

The social 'negotiation' of what is right and wrong in the field of biomedical ethics evokes emotive responses and, mildly put, is a very complex process where multiple actors engage with each other. It is not only important to contextualize issues as far as possible, but also to see them holistically, i.e. amidst other issues, such as the gaps between rich and poor, gender imbalances and the responsibility owed to future generations.

Science and Scientists need to play their own part in keeping to the highest ethical and moral standards, especially as the discipline of science has suffered from a series of public relations disasters of late and because of this scientists are gaining a bad reputation. This exemplified most recently by the scandal involving faked research by the team of Korean stem cell scientists led by Hwang Woo-Suk [10]. Science and technology are powerful players in the modern world and therefore, as the practitioners of these disciplines, we need to be responsible and enlightened in both how we actually use these tools and how we are perceived to be using them.

Open debate about all these biomedical issues must occur if we are to develop ethical judgments about the use and abuse of these technologies within our own countries. However, this debate will be almost impossible while the language we use to represent the issues is so emotive, e.g. unborn baby vs. foetus. It seems that only by educating people about the pros and cons of these technologies will we be able to carry out these necessary debates.

Even then, as countries reach different ethical decisions based on their cultural and moral creed, the possibility of an international framework of biomedical ethics seems remote. At present, the best approach would seem to follow the one we are advocating for nuclear awareness: education, education, education. Without an understanding of all the issues and their implications we will be unable to make correct ethical decisions and the potential for the misuse of this technology will continue to increase.

Notes

1. See http://www.nhsdirect.UK/en.asp?TopicID=641.
2. See http://www.babycentre.co.UK/refcap/4094.html.
3. See http://www.babycentre.co.UK/refcap/4094.html.
4. See http://www.chinadaily.com.cn/english/doc/2005-01/07/content_406794.htm.
5. See http://www.marchofdimes.com/professionals/681_1165.asp.
6. See http://www.nhsdirect.UK/en.asp?TopicID=641.
7. See http://www.hfea.gov.UK/Abouthfea/hfeaPolicy/Preimplantationgeneticdiagnosis.
8. See http://www.marchofdimes.com/professionals/681_1165.asp.
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New security challenges: broadening the Pugwash agenda?

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Building on the legacy of the Russell-Einstein Manifesto and the success of the Pugwash Movement, this paper reflects on the nature of contemporary threats to human security and its implications to the agenda of Pugwash. On the basis of recent conceptual developments in the field of conflict studies and significant changes in current policy practice in the field of 'peace & conflict', this article puts the risks emanating from armament and especially weapons of mass destruction into a larger framework of human security and human development. It argues that contemporary security and conflict analysis especially tends to emphasize the importance of non-military factors and processes in causing and escalating lethal conflict. The article explores the implications of these observations for the Pugwash agenda and how to do justice to the fundamental questions arising from these recent developments in the framework of Pugwash's agenda and interests.

The end of superpower rivalry and the emergence of a different type of conflict

In peace and conflict studies the earlier emphasis on military aspects and 'classical' war studies seems to have dwindled and a more comprehensive and interdisciplinary approach to conflict studies has emerged in academic and policy circles in response to current crises. This development had partly to do with the end of the Cold-War epoch and the resultant changes in perceptions. During the Cold War the focus had been nearly exclusively on the contradictions and (military) power balances between the two superpowers and on the proxy wars they fought. The risk of nuclear escalation of superpower rivalry lay at the basis of the Russell-Einstein Manifesto and the establishment of the Pugwash Movement. The destructive power of nuclear weapons and other weapons of mass destruction had grown to such proportions

that the very survival of mankind was deemed at stake, once those weapons were deployed in war situations.

Paradoxically, the prevalence of those weapons and the risks involved in their use also led to what was termed 'mutual deterrence'. Similarly, 'Third World conflicts' used to be contained to 'manageable' levels, particularly to avoid 'spill-over' and escalatory effects eventually leading to superpower nuclear confrontation. However, after the end of the Cold war this worldwide 'brake' on local conflicts disappeared and the so-called 'decompression effect' occurred, seemingly leading to a multiplication of local and regional conflicts in the early nineties, even though many of them had older roots. Modern media showed the catastrophic humanitarian consequences of those wars, adding urgency to the need to manage and resolve these conflicts. Consequently, the political, military, humanitarian and academic attention turned to a type of conflict that seemed to be characterised by other causes, motives, actors and strategies than the wars associated with an earlier period that had inspired the establishment of the Pugwash Movement.

The new face of war

It is a challenge to define contemporary conflict. If we compare conflict today with conflict in the past, we must admit that not every individual feature of today's conflict is new. However, most present-day conflicts show a different constellation of conflict factors than earlier ones. Some academics therefore have labelled them as 'New Wars' compared to 'Old Wars' [1]. Others have used the notion of 'complex political emergencies', stating that 'contemporary conflicts are not merely complex, but they are ... messes. They are not specific problems with identifiable causes that can be fully understood and for which 'solutions' can be generated. At best, understanding will always be partial, contingencies will play havoc with linear notions of cause and effect and predictability will be at low levels' [2]. Again others use notions like 'non-state trans-boundary conflict', 'post-modern conflict', 'ethnic conflict' or 'intrastate conflict' to describe and analyse these conflicts.

None of these notions may, however, completely encapsulate the complex nature and distinctive features of present-day conflicts, underlining the need to describe them more fully in their time- and place-specific contexts. In this connection, there has been a plea to adopt an ethnographic approach to study those conflicts [3]. Obviously, there is a large diversity in the type, scale and cultures of contemporary conflicts. Even though they tend to share some general features, there are many competing conceptual and theoretical approaches as to their explanation. In the framework of this paper I cannot do justice to the extremely vibrant and varied debates on the nature of current conflict, but shall briefly discuss some important issues reflecting present views in the literature.

The regional and international dimension of intrastate conflict

The author Holsti states that not the relations between states, but the characteristics of the state itself have to be seen as underlying current conflicts [4]. This denotes the fact that the causes of these wars are basically of an internal nature. In this article I therefore refer to contemporary conflict as intrastate conflict. However, I recognise the limitations of this notion. It does, for example, not imply that there is no 'foreign' involvement in these conflicts. On the contrary, neighbouring countries, the United Nations, international organisations, international NGOs, foreign corporate firms, mercenaries, traders, trans-boundary criminal

networks etc. are all involved in the pursuit of war or peace in those countries. Another important factor in this connection is the role of the diaspora, which has contributed to the spread, 'de-localisation' and 'de-terrorialisation' of conflict [5]. In this connection, the word intrastate refers basically to the genesis of the conflict, but not so much to its other characteristics.

The causes of intrastate conflict

Regarding the causes of conflict, some authors focus on the lack of nation-building or state formation, while others tend to promote neo-malthusian explanations about resource scarcity and population pressure. Some do believe that 'poverty breeds conflict'. Others talk about 'identity politics' and even 'ancient hatreds'. Recently, more attention has been paid to the role of 'discourses of violence' in the legitimisation and violent escalation of conflict. In order to explain intrastate conflict we need to take a broad range of factors into consideration on the basis of a trans-disciplinary approach and an eclectic theoretical framework that is constantly confronted with empirical reality. The following remarks reflect some ideas that are generally subscribed to in discussing intrastate conflict.

Intrastate conflicts are usually caused by a complex of factors built up over a long history of tension. Most conflicts seem to have a fundamentally *political* aspect, as they are fought over power and scarce resources. Simultaneously, they are expressions of existing social, political, economic and cultural structures and cleavages [6]. They tend to occur in societies where state legitimacy and popular representation are low, or states are failing. Particular identity groups are excluded from power and political participation. They feel discriminated against. This is compounded by a lopsided distribution of goods and services, where their access to scarce resources is limited or altogether denied by the state. In addition, the religious or cultural identity of these groups is often suppressed. In this way grievances build up over time. Initial demands and peaceful protests are frequently oppressed violently and thus the situation gradually escalates into violent conflict. In contrast to interstate conflicts, it is the polity and society itself that make conditions conflict-prone. Deprived groups may be easily mobilised into violence by conflict entrepreneurs and political opportunists.

Case-studies confirm the importance of political factors in causing conflict and show also that a high incidence of poverty or inequality does not cause conflict directly, but tend to perpetuate and aggravate conflict. This is especially the case, when poverty and inequality are perceived from a perspective of relative deprivation and come to be seen as a consequence of conscious discriminatory government policy. Similarly, external involvement is not a prime cause of conflict, but tends to prolong and intensify the conflict [7]. The same applies to availability of arms that *per se* are not a root cause of conflict, but rather function as an aggravating factor at most.

The role of *economic* factors in present wars is still subject to considerable debate. The emergence of 'economies of violence' that thrive on and feed into those wars has led to a growing emphasis on economic explanations of contemporary conflict as exemplified in the 'greed and grievance' debate [8]. Collier states that contemporary conflicts can better be explained by the economic 'feasibility of predation' than by grievances. He says that rebel movements need a 'discourse of grievance' or a 'language of protest' for their national and international relations, but that these grievances are not the real 'objective' causes of conflict

[9]. It is now increasingly argued, however, that an approach acknowledging the relevance of both greed and grievance would greatly benefit a more comprehensive understanding of contemporary internal conflicts. While social and cultural grievances provide underlying motives for group mobilisation into violence, economic motives do play a role when the war has gained momentum and a scramble for personal gain erupts under armed factions and warlords [10]. It has also been suggested that leaders and followers may be motivated by different sets of factors and that these motives also may change during the course of the conflict.

In conclusion, it can be stated that intrastate conflicts are historical, dynamic and multi-dimensional phenomena that have multiple causes and consequences. The relative importance of military aspects or arms in the explanation of Cold War rivalry has given way to an emphasis on historical, political, economic and social factors in contemporary approaches to intrastate conflict. This also means that the present challenges are more complex and diffuse, less predictable and probably also less amenable to remedial action.

Changing war, changing peace: the need for different approaches

The conduct of intrastate wars shows considerable differences from the classic interstate wars that dominated Cold-War perceptions. Fighting in intrastate conflict takes place between variegated parties and temporary alliances, made up by state and non-state actors. It often becomes hard to discern who are combatants and who are non-combatants. Usually, the civil population is directly targeted by the perpetrators of violence and accounts for 90% of all victims, most of them being women and children. In addition, civil society is subject to widespread displacement combined with large-scale and deliberate destruction of houses and other property. Women often bear the brunt of this violence, as they are usually left behind unprotected by their male relatives taking part in the fighting. They are also less mobile, as they have to take care of young children or old and ill family members. Therefore, they are often unable to flee the onset of violence.

Other characteristics of intrastate conflict are that international conventions and rules for warfare are disobeyed. Many methods directed against the civil population are prohibited under war law and international humanitarian law, and include systematic rape, ethnic cleansing and starvation. Women are targeted specifically as they are considered to be symbols of culture and identity. Attacks on them intend to demoralise and to 'pollute' the whole community. Violence is not bound to the battlefield, but is widespread and fragmented. Hit-and-run attacks are combined with urban warfare, and guerrilla and counter-insurgency strategies. Intrastate conflicts tend to be protracted, but may show periods of relative calm interspersed with episodes of intensive fighting. Zones of peace alternate with zones of war. Use is made of light weaponry and 'small arms' and even of agricultural implements and knives. The technological aspect of those new wars is relatively less salient and sophisticated, and most arms are relatively inexpensive compared to conventional warfare.

These characteristics of warfare necessitate other approaches to conflict prevention, conflict management, peace building and reconciliation and – for that matter – arms control. The conventional concepts and methods of peacemaking through diplomacy, 'high politics' and negotiations exclusively between government bodies no longer suffice. In this regard, Hilhorst and Frerks ask: 'How to negotiate when it is not even clear whom to invite to the

negotiation table? How to apply diplomacy if leaders have no clue or couldn't care less about the Geneva Conventions? How to call a cease-fire if there are not even armies? How to organise disarmament when much of the weaponry consists of everyday tools? And how to isolate combatants when they involve much of the civil population?' [11] They argue that 'warfare' calls for 'changing peacefare'. This reasoning obviously also affects efforts in disarmament and arms control that mainly concern interstate relations.

Peace and security revisited

Current conflicts therefore necessitate a new notion of peace and security. The dichotomy between peace and conflict seems to hold no longer. Currently, most societies in conflict show a hybrid nature and are characterised by a bizarre combination of both peace and war. The then Dutch development minister Jan Pronk stated: '... ever more countries linger in prolonged states of half peace/half war. The nature of present intrastate conflicts makes it increasingly difficult to determine when and where violence ends and peace starts. .... This is also true the other way round: in many societies we are not certain when and where peace ends, and violence starts' [12]. Johan Galtung has introduced the distinction between 'negative peace' and 'positive peace'. Whereas the former only denotes the absence of violence (weaponry), the latter implies a movement toward a more egalitarian and just society, where the root causes of conflict are being addressed.

Not only the notion of peace is subject to change, but also the concept of security. Instead of using the concept of military security, academics and policymakers in the field of intrastate conflict nowadays often use the notions of 'comprehensive' and 'human security', which transcend a purely military approach to war and peace. Human security has been defined by the UNDP in its Human Development Report: 'For most people today a feeling of insecurity arises more from worries about daily life than from the dread of a cataclysmic world event. Job security, income security, health security, environmental security, security from crime – these are the emerging concerns of human security all over the world.' The introduction of this concept has led to a shift from security through armament to security through sustainable human development and one that transcends the usual emphasis on territory [13].

It nowadays is acknowledged that security is a public good like other goods, such as education or health. The provision of such human security is obviously not anymore the exclusive domain of policy makers, diplomats and military specialists, but has opened up the possibility for development, relief and peace-building agencies to contribute to security and peace. In policy circles there is at present a plea to formulate integrated, multi-actor responses to the comprehensive security challenges faced, combining the efforts of the Departments of Foreign Affairs, Defense, Development Cooperation, Environment and Trade. Such a comprehensive understanding of security has now become widely accepted, as evidenced in recent publications such as *A More Secure World: Our Shared Responsibility* by the UN High Level Panel [14], *State of the World 2005: Redefining Global Security* by the Worldwatch Institute [15], or the *European Security Strategy* formulated by the European Union.

Also in Pugwash, this comprehensive type of analysis has been emerging. At the 54th Pugwash Conference in Seoul (2004), Secretary General Paolo Cotta-Ramusino stated: 'We in Pugwash started as a small community made up almost exclusively of scientists who wanted to promote dialogue and mutual understanding and point out the risks associated with the

presence of nuclear weapons and other WMD. As you can see from our activities and participation, many of us are still scientists concerned with our responsibility and with the possible consequences of developments in Science and Technology. It is not only weapons, which matter when we are talking about human security. Other non-military aspects (unequal economic development, the spread of specific diseases, the environment) can have a dramatic impact on our security and ultimately provide sources of conflict. There is certainly space now and in the future in Pugwash for these problems.'

The High Level Panel report mentions crime, poverty, infectious disease and environmental degradation as serious security threats apart from interstate and intrastate conflict, terrorism and nuclear, radiological, chemical and biological weapons. The Worldwatch Institute Report talks about 'problems without passports', such as endemic poverty, growing inequality and unemployment, international crime, population movements, recurring natural disasters, ecosystem breakdown, new and resurgent communicable diseases. It also emphasises that a military approach to the problems alone is inadequate and probably counterproductive. Individual (donor) countries, like, for example, The Netherlands and the UK, have adopted similar comprehensive perspectives to deal with conflicts in their foreign and aid policies.

This implies that economic and development aid policies are now focusing explicitly on the issue of conflict and are mobilised to contribute to conflict resolution and peace-building. This has led to significant changes in those policies. They have become 'conflict-sensitised' [16] and must now work '*on* conflict'. In a publication on donor practice in conflict situations, Jonathan Goodhand introduced this notion implying that development programmes can exploit opportunities to positively affect the dynamics of conflict. Instead of continuing 'business as usual' or 'working *around* conflict', development co-operation should explicitly refocus its programs to address the root causes of the conflict, e.g. governance, poverty alleviation, social exclusion. In addition, they should continue to work on incentives for peace and disincentives for violence, and promote conflict mediation and protection of human rights.

Implications for Pugwash

The Russell-Einstein Manifesto and Pugwash's advocacy with regard the elimination of nuclear weapons and the attendant initiatives in non-proliferation, arms control and disarmament continue to be of utmost relevance today. Yet, the changing nature of contemporary conflicts and the emergence of 'new security challenges' as compared to conventional warfare, have added new concerns to the global agenda and perhaps also changed the order of priorities. The last decades Pugwash has in fact started to explore the challenges emanating from this current, comprehensive security problematique.

The Dagomys declaration of 1988 already stated 'Without reducing our commitment to arms reduction and war prevention, we must recognise that environmental degradation and large-scale impoverishment are already facts and can lead to a massive catastrophe even if nuclear war is avoided. .... These linked environmental problems affect all nations. They exacerbate international tensions and increase the risk of future conflicts'.

The Goals of Pugwash in its Tenth Quinquennium (2002-2007), include: 'working to transform and reverse the conditions of economic deprivation, environmental deterioration, and resource scarcity and unequal access that are deplorable in themselves and give rise to despair, resentment, hostility, and violence around the world. Pugwash will continue to address

this broad web of inter-related dangers, and to work for the sustainable use of energy and natural resources and the constraint of anthropogenic disruption of climate.'

Pugwash has gained considerable experience in those domains from a diversity of Pugwash workshops that addressed themes such as 'Human Security in the Southern African Context', 'Intervention and Sovereignty', 'Public Health Systems in Developing Countries', 'The Impact of Agricultural Biotechnology on Environmental and Food Security', 'Methods for Implementing the Framework Convention on Climate Change', 'Sharing the Planet: Population - Consumption - Species', 'The Security Aspects of HIV/AIDS', 'Economic and Social Inequities in Latin America', and a number of workshops addressing regional conflicts (in South Asia, East Asia and the Middle East).

Obviously, more efforts are indicated before we can fully conceptualise these contemporary challenges and deal with them. A number of issues are still to a certain degree contested, but on the other hand developments are moving rapidly, also in terms of emerging, evidence-based insights.

Extending the line of thinking that Pugwash has already developed in the past decades, Pugwash should systematically include these contemporary challenges in its regular agenda. In particular, the conceptualisation of such challenges within a larger framework of Human Security and the criteria for attaining a clear action-oriented focus need further debate. In this connection, Pugwash's former Secretary General, George Rathjens, emphasised at the 52nd Pugwash Conference in La Jolla (2002) that 'Pugwash should focus on problems of importance, and, in general, since it is an international organisation, on those of direct concern to more than one country …. It should concentrate its efforts in areas where it has comparative advantage over other like-minded organisations …. [And it] must concentrate its efforts generally on what I will call knife-edge problems: on decisions where the forces on the two sides of an argument are close to being in balance: problems where possible Pugwash involvement might be instrumental in pushing the decision one way or the other – and on a time-scale measured in months or years; not one measured in decades.'

Many of the issues discussed above require the same intellectual and moral resolve and effort as the nuclear threat nearly fifty years ago. At the same time we recognise that the multiplex and diffuse nature of the current security challenges make them less easy to address and it may also be more difficult to mobilise the same public response or indignation. We also move from the relatively clear-cut domain of armament and hard science to the more complicated and arguably less tangible domain of politics, economics and social science. Yet, Pugwash members cannot ignore these challenges and should relate to these issues as they present themselves here and now.

Acknowledgements

Notes

1.   Mary Kaldor, New & Old Wars: Organized Violence in a Global Era, Polity Press, Cambridge, 1999, pp. 6-7. She argues that new wars involve a blurring of the distinctions between war, organized crime and large-scale violations of human rights. New wars are based on 'politics of identity', while old wars were characterised by 'politics of ideas'.

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3.   P. Richards, New war: An ethnographic approach, in P. Richards (ed.), No Peace, No War: An Anthropology of Contemporary Armed Conflicts, Ohio University Press/James Currey, Athens/ Oxford, 2005, pp. 1-21.

4.   K. J. Holsti, The State, War and the State of War, Cambridge University Press, Cambridge, 1996, p. 37.

5.   J. Demmers, Diaspora and conflict: Locality, long-distance nationalism, and delocalisation of conflict dynamics, The Public 9 (1) (2002) 85-96.

6.   See [2, p. 16].

7.   P. Douma, G. Frerks and L. van de Goor, Causes of Conflict in the Third World: Synthesis Report, Clingendael Institute, The Hague, 1999.

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10.   P. S. Douma, Political Economy of Internal Conflict: A Review of Contemporary Trends and Issues, Clingendael Institute, The Hague, 2001, p. 18.

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14.   UN Secretary General High Level Panel on Global Threats, Challenges and Change, A More Secure World: Our Shared Responsibility, UN, New York, 2004.

15.   Worldwatch Institute, State of the World 2005: Redefining Global Security, W. W. Norton & Company, New York/London, 2005.

16.   FEWER, International Alert and Saferworld, Conflict-Sensitive Approaches to Development, Humanitarian Assistance and Peacebuilding: Resource Pack. (http://www.conflictsensitivity.org/ resource_pack.html).

Poverty, relative deprivation and political exclusion as drivers of violent conflict in Sub Saharan Africa

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During the post-colonial period, the Sub Saharan region has witnessed a substantial number of violent conflicts, mostly within states between contending ethno-political entities manipulated by rivaling political elite groups. The problems within these so-called fragile or failed states are closely related to a lack of a 'social contract' between incumbent elite groups and constituent ethnic communities, which leads to political fragmentation, exacerbated by the interaction of diverse social, ethnic and resource exploitation-related issues. Inter-group violence in Sub Saharan Africa is therefore likely to be the outcome of a political process whereby some local groups take on other groups living in the same region, mostly as a proxy war for conflicts resulting from the uneven impact of state policies concerning resource exploitation. The cases of Niger and Senegal are presented as illustrative examples of this process of intra-state conflict escalation. It is concluded that the state in Sub Saharan Africa needs to reinvent itself; the incumbent state elite hould adopt a long-term perspective based on solidarity.

Within the effort to identify and formulate an entire gamut of new challenges to human security [1], and in the process of considering new clusters of causality, the interplay between different causes of conflict should not be overlooked. In Sub Saharan Africa the combination of the political exclusion of specific communities and ethnic groups in relation to a shared group perception of deprivation that results from political decision making has become an explosive cocktail that underlies many violent conflicts in the continent.

Most present day political regimes are based on narrowly defined constituencies that support for – and are looked after by – political leaders of the day. Within a global economic context in which poor countries are relegated to the position of resource providers, the internal standoff between political elite groups and their respective constituencies is defined by the capacity of these states to distribute income to the various constituent groups. In most cases there is not enough to distribute among all groups and citizens. This results in a political

scramble for state-controlled resources that leads to violent conflict and generally ends in 'winner takes all' scenarios which elevate regimes to monopolistic power positions that are extremely fragile to internal violent opposition based on clashes between marginalised groups. The problems of so-called fragile or failed states relates closely to a lack of a 'social contract' between incumbent elite groups and constituent ethnic communities leading to political fragmentation. In the present day situation, political entrepreneurs can easily mobilise large groups of mostly idle and poor youths, which in combination with free flowing small arms, leads to the formation of a conflict-prone environment in which raw power struggles thrive at the cost of humanitarian fallout and a perpetuation of cyclical exclusion of those who are associated with the losers of the various rounds of internal violence.

In this short article, some examples of state versus internal opposition are highlighted. It is demonstrated that the lack of political discourse between protagonist elite groups ultimately leads to forms of violent resistance against the state. The challenge for incumbent regimes in Africa remains to engage in a peaceful political dialogue based on the principle of inclusiveness and equality of all communities living within a given state's territory.

Poverty and inequality in the contemporary political context

Poverty is a widespread and persistent characteristic of all Sub Saharan African countries. Within most states there is a huge gap between a small elite group, an embryonic middle class and an impoverished mass of peasants and urban poor. In the wake of the political independence of many African States, the former colonisers and other so-called advanced or developed states have initiated activities and programmes targeting the most deprived and poor segments of these societies. Although some improvements have been accomplished in the fields of health care, education as well as economic development, the material well-being of the vast majority of Africans has not improved substantially over this period. In fact, poverty remains the most pervasive feature of livelihood of Africans, urban and rural dwellers alike.

During the post-colonial period, the Sub Saharan region witnessed a substantial number of violent conflicts, mostly within states between contending ethno-political entities manipulated by rivaling political elite groups. Regardless of the ideological facade of a given regime, the principles of co-optation and exclusion formed the basis of the prevailing political system. Political leaders in Sub Saharan Africa have held on to power, time and again, by mobilising client groups through the distribution of goods and services in order defend their interests in the face of resistance from contending elite groups or against incursions of outsiders. Behind the current crises and political disarray in many African States lies the complex interaction between various stakeholders with regards to the access to and struggle over the control of scarce economic resources. In many cases, poverty and inequality are perceived as the blatant and conscious result of purposeful policies of exclusion and discrimination initiated by the incumbent power elite of a particular ethnic, religious or linguistic group.

Rural and urban poverty

Sub Saharan Africa, despite a rapid urbanisation trend, currently remains overwhelmingly rural in character. Living conditions of the majority of people are harsh and largely dependent on climatic, physical natural conditions and a complex pattern of on-and-off farm activities involving different members of extended families seasonally employed in a whole range of

activities. In Sub Saharan Africa, furthermore, the prevailing agricultural techniques and livelihood strategies have remained virtually unchanged for a substantial period.

Consequently, in the rural setting, poverty initially was not perceived as the outcome of power struggles between stakeholders in society since climatic and other structural factors had a more decisive impact on living conditions. Poverty in absolute terms therefore appears to relate to the predominant strategies of livelihood of different population groups and reflects the current state of development. Nevertheless, the ongoing process commonly referred to as 'land pressure', due to steady growth of population and cattle, has led to increased scarcity and has shifted attention to political decision making in the rural context. Gradually, the struggle for access to natural resources (notably land, grazing areas and water) has emerged as a crucial issue in multiple parts of the Sub Saharan Region. Various stakeholders are involved in these struggles, including absentee owners of land and cattle who compete with local user groups for these scarce resources. If local users are confronted with powerful outsider elite groups closely linked to the state, violent conflicts will emerge more likely, as local elite groups will try to mobilise these constituencies into organised resistance movements.

In the urban context, conditions are rapidly changing and traditional patterns of social networks tend to loose out to modern anonymous market relations between individuals. In this setting, poverty is personalised and hence individuals are more vulnerable to changes in their own livelihood opportunities. So-called power-brokers, emerging from among the ranks of disenfranchised politicians, opposition leaders or traditional leaders fearing loss of power, will try to capitalise upon the discontent of such urban poor.

Resource competition

Additionally, precious resources such as minerals or oil have become sources for intense political struggle between elite groups in most Sub Saharan States. These groups have repeatedly manipulated the existing ethnic diversity in order to enforce a military victory on adversaries, resulting in a proliferation of intrastate warfare. This process has emerged as a structural underpinning of some of the recent violent intrastate conflicts in the region (Liberia and Sierra Leone, to name two).

In some cases, protagonist groups successfully try to take on the state in order to legitimise their claims on such precious resources. Such insurgencies can easily feed on the processes of marginalisation and deprivation of both rural and urban constituencies. In other cases the incumbent state elite manages to effectively protect its interests by using military force to repress the population and competing elite groups. In the latter case, the disenfran-chised citizens have few options to survive in the formal economy, turning either to migration, to self-sufficiency in agriculture or to an activity from among a proliferation of alternative survival strategies (black marketeering, informal economy, smuggling). Moreover, control over the gains of economic exploitation of available natural resources as well as over the state apparatus itself tends to reinforce continuity in power for the elite group. Hence, efforts aimed at change, such as the recent democratisation trend, have met with strong resistance from the incumbent regimes in the various African states.

The impact of democratisation

The democratisation trend in Sub Saharan Africa has sometimes resulted in power transfers but in many cases led to increased polarisation between population groups and to the emergence of violent conflicts. In this political context, states cannot live up to the expectations nor fulfill mandates that have emerged in the contemporary political landscape of the Western World. With the state actor neutralised as a potential mediator to sooth the inequality issue within the continent, the outcome of the poverty issue has become linked to that of the political power struggle itself. The prevailing mode of distribution of income and resources leaves little perspective for structural change in the short term. The question of inclusive governance has become crucial if the poverty issue is to be tackled effectively.

Structural factors thus determine the impact of recent demographic and socioeconomic developments in the rural and the urban setting, which have progressively led to situations of scarcity in which stakeholders groups are confronting each other directly in a zero-sum confrontation. Mineral resources have added an extra dimension to this struggle as the incumbent state elite depends on the revenues from such resources to survive. The competition for access to such sources of income takes place at various levels; between stakeholders groups at the local level; between local groups and the state; and between competing elite groups at the state level. The following section highlights two examples of these different levels of conflict and aims to clarify a number of context-specific linkages between the different socioeconomic factors involved. The examples deal with the Tamajaq rebellion in Niger ad the Jola insurgency ni the Casamance region of Senegal.

Two examples: Niger and Senegal

The Tamajaq rebellion in Niger

Root causes

In Niger, at the end of the 1980s, a minority nomadic group, the Tamajaq, rebelled openly against the state in a bid for a more equitable resource distribution. Structural factors in this conflict were the historical formation of the state of Niger, whereby the erstwhile powerful Tamajaq groups had been militarily defeated at the beginning of the century by the French followed by the abolishment of slavery destroying the backbone of their political economy. The former rulers were thus marginalised in the process, reinforced during the independence when representatives from the southern Sub-Saharan peoples within the Niger territory took control of the newly emerging state.

During the uranium boom of the late 1970s, the military head of state (Kountje) had focused primarily on state building endeavour through the instigation of the so-called 'Société de Développement'. The entire society was divided in political sub-units which had to conform to socialist rhetoric whilst aiming to attain specific productivity levels. However, this ambitious social experiment failed to address the ethno-linguistic diversity of the country as well as the profound differences in livelihood strategies between agriculturists and herdsmen. Furthermore, the state proved incapable to diversify its sources of income and merely spent benefits of the uranium export in the construction of roads and government offices in the capital

Niamey. The successive post-independence governments failed to address the underlying problems of the fragile domestic economy.

Throughout the post colonial period, land pressure within Niger gradually led to the disappearance of the buffer area between traditional agricultural and pastoral lands: the so-called agricultural boundary had shifted northwards. This resulted in marginal agriculture in fragile ecological settings, in turn provoking land degradation, erosion and desertification. The traditional annual movements of cattle over large distances had become more hazardous as agriculturists over time had become agro-pastoralists, reserving harvest residues and other fodder for their own cattle, hence limiting possibilities for the transhumance movements [2]. The traditional nomadic livelihood strategy became endangered in this changing socioeconomic setting.

The effects of ecological crises

The main triggering event for the Tamajaq rebellion was doubtless the deteriorating socioeconomic position of the nomadic peoples in general and the failure of the government to address grievances and to provide adequate emergency and follow up assistance in the aftermath of the consecutive draughts. The nomadic peoples had suffered greatly from the impact of the successive droughts in the early 1970s and 1984/1985 and large numbers fled to neighbouring countries, notably Algeria and Libya. The Nigerien head of state, Ali Saibou, who succeeded military dictator Kountje in 1987, promised a safe return to the Tamajaq refugees and reintegration into society, among other things, by offering resettlements fees, distribution of food and a number of cattle per family to enable restoration of stocking rates prior to the environmental calamities. The state proved incapable to fulfill these promises when the Tamajaq started to return in numbers, greatly increasing their ordeal. The ensuing frustrations provoked extremist activities in turn leading to some violent incidents whereby Tamajaq elements looted public facilities, pillaged village stores and public markets. These incidents were part of a broadly supported protest movement to which the government turned a deaf ear. Instead, the national army was used to repress Tamajaq discontent leading to incidents in which civilians were killed.

The Tamajaq rebellion

Under a strong military repressive state the differences between ethnic groups were somewhat dissimulated to resurface when the political climate allowed for the expression of divergent political opinions. This destabilised the fragile national unity of Niger leading to proliferating factionalism in an atmosphere of distrust towards the national army. During the National Conference, held in the second half of 1991, community leaders from the Tamajaq appealed for rehabilitation of their community but were humiliated instead. This triggered the outbreak of the rebellion, resulting in the launching of the 'Front de la Libération de l'Air et de L'Azawak' (FLAA). The National Conference, dominated by representatives of the student movement and sedentary ethnic communities, failed to take into account the feelings of frustration and marginalisation amongst the nomadic peoples.

Within the Tamajaq community there was no unified strategy with a common goal. Various factions independently engaged security forces in different areas, making for a fragmented guerrilla war which the understaffed and badly armed national army could barely

contain. There were groups who favoured independence or far reaching autonomy whereas others claimed greater representation in the political domain as well as a fair share of resources. Disputes about the relative demographic weight of the Tamajaq as well as the demarcation of their homelands blocked a peaceful solution for a long period of time.

Conclusion

The major underlying factor of this political crisis was provoked by the livelihood crisis that confronted this erstwhile nomadic people. In the colonial setting in-built response mechanisms to crisis situations had gradually eroded and created a setting in which the Tamajaq had become vulnerable to climatic hazards. The combination of ecological crises, land pressure, loss of response mechanisms and the desire to maintain a proper cultural identity within a fragile national context of a state that failed to provide adequate support when it mattered, resulted in the Tamajaq quagmire.

The Jola insurgency in the Casamance region of Senegal

Root causes

In the Casamance area of Senegal, a long standing dispute between the Jola and the Senegalese state has resulted in a protracted internal violent conflict that has lasted for over ten years. Structural factors underlying the conflict seem to be the nature of the mechanisms employed by the state to penetrate local society and to exercise political control. As the nature of political allegiance was brokered through a hierarchy of formal and informal elites (mostly Muslim marabouts), the Jola, who stand out as a rather egalitarian and socially unstratified society, were not effectively integrated in the national polity. The application of the new constitution, transferring previous communal land rights to the state, has had a profound impact on local customs and resource management in the Casamance region. Another outstanding feature of the Jola is their attachment to land (notably rice paddies) as they rely on a precarious ecosystem in the low coastal areas of the Casamance river estuarium allowing for a combination of rice cultivation, marginal fishing and cash-crop production of peanuts and cotton. Furthermore, the region is commonly seen as the breadbasket of the country so it can therefore hardly be labeled as poor if compared with other regions in Senegal. Within the region itself the Jola majority seems to be poorer than other ethnic groups residing in the Casamance area. This, however, can be partly attributed to traditional livelihood strategies reflecting Jola culture. A number of socioeconomic developments have resulted in the mobilisation of Jolas in violent opposition to the dominant Wolof ethnic group and to their 'cronies' residing in the Jola homeland, the Casamance region. The pivotal factors to be highlighted are the loss of control over important resources, the lay-offs in the public sector affecting Jola intellectuals, the fear of losing Jola cultural identity and the repression by the state.

Loss of control over important resources

The selective exploitation of fishery resources by foreign ethnic groups is resented by the Jola community. As a cumulative result of climatic deterioration and out-migration fishing, the Casamance river and the Atlantic Ocean have become a way to overcome the farming systems

crises. Although the indigenous fishermen are far more numerous than the immigrant Serer and Toucouleur fishermen who control large-scale specialised fishery and the distribution channels, they play only a marginal role in this type of fishery. The Senegalese State earns foreign currency with the export of shrimps and deep-sea fish. The Jola thus compete for the same resources. The result of this has been resentment between the Jola and Toucouleur communities. The Jola feel that other ethnic groups should have consulted with them prior to the exploitation of natural resources in the region as they consider themselves the legitimate owners.

Lay-offs in the public sector

Concurrently, the labour migration of young Jola to Dakar, an alternative livelihood strategy dating back to the 1950s, became hazardous as of the mid 1970s. The limits to the absorption of labour power in the Senegalese public sector and the subsequent lay-off of state personnel also left a large part of young urban Jola unemployed. Disappointment with the state among the educated casamancais led them to withdraw from the state and return to their villages of origin to settle as farmers. The initiative by the Senegalese state to incorporate at least part of this elite after the 1982 incidents was either not encompassing enough or too late.

Fear of losing Jola cultural identity

Then there was also the gradual penetration of the Wolof language and culture (modern music, food and dress) notably among the young Jolas. Since the independence Wolof replaced Creole as a lingua franca in the Casamance. The slow 'Wolofisation' has added to the grievances as in the national media Wolof predominates and regional culture is completely ignored. Perceived neo-colonialism combined with fear of losing one's cultural identity in view of the ongoing 'Wolofisation' of the youth has angered most Jola.

State repression and violent conflict

After the bloody confrontations of 1982 and 1983, in which over a hundred people died, the Senegalese state took an ambiguous stand towards the region. In order to counter the attraction of the newly emerging resistance movement MFDC (Mouvement des Forces Démocratiques de Casamance), the central government appointed several young casamancais in the local bureaucracy while simultaneously setting up a committee of wise men to address the underlying causes of the conflict. On the socioeconomic dimension, the establishment of development projects and agencies were an important priority for the State and the external donors to counter some of the underlying grievances. On the other hand, however, the state divided the Casamance region into two constituent entities, the smallest being the Jola inhabited Lower Casamance, effectively thwarting the MFDC independence movement's claim to the entire region. Furthermore a campaign of repression was unleashed selectively against suspected supporters of the MFDC within the Jola community. As the local society is profoundly unranked in nature, the soothing effect of appointing some elements to positions within the administration was limited. They as well as other Jolas working on behalf of the central government were described as traitors by the MFDC movement. The repressive measures resulted in further support among the Jola for the MFDC cause. When in 1989 the

state of Senegal was confronted with internal and external threats [3], the MFDC chose to take on the state militarily. From that moment on, several rounds of hostilities have taken place. However, the civil war has caused enormous damage to the economic infrastructure of the region. Tourism consequently has diminished and even stopped completely for some years (1991-1992, 1992-1993).

Conclusion

Overall, the interplay between various socioeconomic factors plays an important role at the background of this violent conflict. The impact of the new constitution on land distribution, the expansion of modern economic activities (fisheries and tourism) mainly by immigrants ignoring local entitlements, the incapacity of the state sector to absorb newcomers on the labour market or to accommodate the casamancais otherwise combined with a longstanding perception of being slowly colonised, as exemplified by the penetration of Wolof culture, fuelled a strong sense of marginalisation and facilitated political mobilisation of Jolas by disenfranchised Jola intellectuals escalating into civil war. Again, poverty in and by itself does not account for the outbreak of conflict in the case of the Casamance region in Senegal. This case clearly demonstrates the interplay between the various levels of conflict present in Sub Saharan Africa.

Assessing the role of poverty with regard to the outbreak of violent conflict

With regard to poverty as an independent contributing factor to the outbreak of violent conflict, one needs to take the predominant structural characteristics of resource allocation and wealth accumulation within states into account. The level of poverty in absolute terms can not be directly related to the emergence of violent conflict within these societies. However, once group identity and poverty are linked, or a perception of discriminatory treatment can be discerned, the propensity towards violent opposition to the state or other groups becomes apparent, as can be inferred from the Tamajaq and Jola cases. In general terms poverty can be labeled as a possible mobilising factor on condition that it overlaps with group identity. Especially, if poverty is conceived as the end result of a conscious political process by which specific groups are marginalised or deprived of their resource base its mobilising capacity increases manifold. In the next section the focus lies with the relationship between the selective nature of some state policies resulting in the promotion of inter group inequality, feeding discontent among disenfranchised population groups.

The impact of state policies on inter-group inequality

Inter-group inequality

In West African states there has always been a structural inequality between the administrative and industrial centres and the countryside in which a subsistence economy predominates. Within this spatial dichotomy the selectively imposed cash-crop production has created a dependent peasantry that mostly did not receive adequate compensation from the benefits reaped from the export of these products. Instead, the existing spatial inequality was reinforced by the deliberate marginalisation of these population groups by the political and economic elite

living in the urban areas. The redistribution of various social services to the rural areas was only implemented haphazardly and mostly as a direct outcome of patronage networks linking elite members to their respective constituencies. In the urban setting, state elites have relied for a long time on subsidies on staple foods to co-opt urban constituencies. As a result of the IMF and Worldbank imposed austerity programmes most of these subsidies have been abandoned, occasionally resulting in widespread urban unrest. Inequality between different groups in the rural and urban settings therefore have become more exacerbated, in turn providing a fertile recruitment ground for local power brokers, in their quest to wrestle power from the incumbent political elite.

Selective resource exploitation

Inequality between groups in West African societies has a stronger conflict potential than absolute poverty as such. In the Casamance region the selective procedures of land expropriation by the state combined with aquatic resource exploitation by non-indigenous groups has strengthened the perception among the Jolas that they are systematically exploited by the dominant Wolof ethno-linguistic group, as they control state bureaucracy. Although the provision of social services by the central government clearly does not disfavour the region in comparison to other regions in Senegal, there is a widespread image among the Jola that the state fails to deliver services and investments. The Jola represent quite a confusing example of deprivation as they deliberately hang on to subsistence practices as a central feature of their culture while rejecting the market-oriented productive practices of other groups thus depriving themselves of cash-earning activities. Clearly, therefore, socioeconomic factors cannot solely account for the Jola insurgency. The negative impact of state policies regarding local resources, without taking Jola interests into account, has jeopardised legitimacy of the Senegalese state. The state exploits a resource rich area (tourism, fishery, groundnuts, and cotton) but fails to compensate its traditional inhabitants adequately.

In Niger, the division between agriculturists and pastoralists is crucial as specific ethno-linguistic divides coincide with this dichotomy. Fulani, Arabs, Toubous and Tamajaq are all ethno-linguistic groups primarily engaged in the livestock sector. The relative decline of this sector due to a breakdown of traditional coping strategies following the droughts that ravaged the Sahel in the seventies and eighties has impacted strongly on livelihood strategies for these groups. Over the last decades, more and more peasants have become agro-pastoralists blurring the rigid boundary between both livelihood strategies. However the Fulani, Toubous and Tamajaq remain largely dependent on the livestock sector for survival. As a result Tamajaq have attacked sedentary groups in a desperate bid to stem the tide. Moreover, the socioeconomic situation of the nomadic ethnic groups has created a structural dependency on state resources. As the state proved to be incapable to provide enough relief assistance to these communities their hostility towards the central state increased. The state has already exploited the resources (uranium) of the Tamajaq heartland in the past, but has never reinvested in the area, presently failing to provide compensation for the traditional inhabitants.

Inter-group violence in Sub Saharan Africa is likely to be the outcome of a political process whereby some local groups take on other groups living in the same region, mostly as a proxy war for conflicts resulting from the uneven impact of state policies concerning resource exploitation. The rationale behind such violence often can be related to selective resource

exploitation by the state without concomitant compensation for local stakeholder groups concerned. The difference between the Jola and the Tamajaq cases lies in the fact that the Senegalese government still has the option to work out a compromise, since the Casamance area remains a potentially rich region, whereas the government of Niger has little to offer, as the uranium profits have been consumed already, and the Tamajaq areas seem to offer only marginal perspectives for future riches.

Structural limitations to resource extraction

In general, the mobilising capacity of inter-group inequality is omnipresent in the West African context although this does not inevitably lead to violent clashes between contending groups. The state, provided it can generate sufficient resources, can soothe some of such potential conflicts. However, as has been stated earlier, the state itself rarely constitutes an independent entity. Resource availability and extractive capacity through tax collection from the collectivity in this context are pivotal factors in the socioeconomic perspective on the emergence of violent conflict. Economic development to a large extent determines the potential for state extraction of funds to be redistributed through various sectoral budgets. In the case of Africa, the economic performance of individual states has been strongly determined by the fluctuations of the international commodity markets. Other important events include the oil crises of the early 1970s and several climatic disasters such as the recurrent droughts in the Sahel of which those of 1973-1974 and 1984-1985 stand out prominently. The economies of Senegal and Niger, in which the conflict cases elaborated in this paper are situated, are extremely dependent on single products, groundnuts and uranium respectively. Against the backdrop of the structural weaknesses already highlighted this vulnerability has led to budget deficits and external indebtedness. Hence, reliance on external sources of income has become extremely important for regime survival.

The fragility of the state system in Sub Saharan Africa

The ongoing struggle for access to scarce resources in Sub Saharan Africa has led to the proliferation of internal conflicts, in which contending elites aim at capturing the ultimate prerequisite of power: the state. This process has reinforced the process of state disengagement between the state bureaucracy and the inhabitants it is supposed to cater for with the provision of services. The exclusionary policies of selected resource exploitation have aggravated this situation and undermined the remaining credibility of many states. The impact of external meddling aimed at supporting minimal governance conditions through financial support has, at best only temporarily halted the process of state disintegration and power struggle between contending elites. The cumulative impact of cutbacks on government spending, largely caused by external conditions imposed by financial donor institutes, has among others resulted in the lay-off of civil servants, the reversal of subsidies for staple foods and the apparent inability to compensate for loss of income to elite-supporting sectors of the state apparatus. These consequences have undermined the stability of the fragile state bureaucracies in Sub Saharan Africa, in turn triggering discontent and sometimes rebellion of the armed forces or other disgruntled groups such as unemployed intellectuals in West Africa.

As a result, inter-elite competition has worsened and the number of protagonists, involved in internal warfare, has increased.

Conclusion

In Sub Saharan Africa, many states lack the capacity to extract sufficient resources to be able to provide a minimum level of services to the population at large. The economic dependency of many such states has increased because of structural macro-economic limitations. Furthermore, the state has become the prime target for elite competition, effectively crippling its potential for conflict mediation. The elite power struggle has increased the existing division between the state apparatus and the population, annihilating the embryonic legitimacy of the state as an impartial arbiter. Therefore, the state in Sub Saharan Africa needs to reinvent itself in order to try and stem the tide of violent political confrontations. In order to try to solve resource-related problems and the crucial issue of impartiality in resource distribution to all constituent groups in society, the incumbent state elite should adopt a long-term perspective based on cross-cutting solidarity between groups who ultimately share the same geographical space and are forced to make ends meet with whatever resources are to be found within that space.

Notes

1. See Georg Frerks, New security challenges: Broadening the Pugwash agenda?, ISYP Journal on Science and World Affairs 2 (2) (2006) 51-58 (this issue).
2. 'Transhumance' is a term used for nomadism, where livestock move to follow grazing over considerable distances following set seasonal patterns (with the whole family of herders living in temporary shelters which move with the herds all the year round).
3. In 1989 several events coincided: the post elections riots in Dakar in 1989, followed by the Senegal river border conflict between Mauretania and Senegal, the dissolution of the Confederation Senegambie (1981-1989) and the dispute with Guinee Bissau over potential oil reserves on the continental plain off the coast of the Casamance.

Academic and social responsibility of scientists

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'Science Agenda – Framework for Action', a document endorsed at the International Council for Science (ICSU) and UNESCO's 'World Conference on Science' in 1999, recommends that 'the basic ethical principles and responsibilities of science' be an integral part of the education and training of all scientists and engineers. However, within this document it is not clearly defined what exactly is to be understood by the phrase 'the basic ethical principles and responsibilities of science'. The aim of this article is to characterise a possible meaning of this phrase, emphasising the academic and social responsibility of individual scientists and engineers. In doing so, a model is presented and used. The model suggests that the ethics of science concerns three interacting levels: a normative level where ethical principles of science are set up, discussed, and justified; an individual level where the ethical principles are translated into responsible actions of individual scientists and engineers; and a structural or contextual level where the social institutions and mechanisms that surround the individual scientists and engineers are addressed.

Teaching ethics to science and engineering students

The document 'Science Agenda – Framework for Action', agreed upon at the International Council for Science (ICSU) and UNESCO's 'World Conference on Science' (WCS) held in Budapest in 1999, recommends that

> [t]he ethics and responsibility of science should be an integral part of the education and training of all scientists. It is important to instil in the students a positive attitude towards reflection, alertness and awareness of the ethical dilemmas they may encounter in their professional lives. Young scientists should be appropriately encouraged to respect and adhere to the basic ethical principles and responsibilities of science [1].

In other words, the future generation of scientists must learn to respect the so-called 'basic ethical principles and responsibilities of science'. One of the means to promote this objective is the inclusion of 'ethics and responsibility of science' into university science and engineering training programmes. It is noted that, at the moment, ethical aspects are rarely included in study programs educating scientists and engineers [2].

The ICSU/UNESCO document identifies UNESCO's World Commission on Ethics of Scientific Knowledge and Technology (COMEST) and the International Council of Science's (ICSU) Standing Committee on Responsibility and Ethics of Science (SCRES) as having a special responsibility to follow up on this issue [3].

One might imagine that science education research communities, and groups of scientists and engineers that work within the area of social and global responsibility of scientists – such as the Pugwash Conferences of Science and World Affairs (Pugwash) and the International Network of Engineers and Scientists for global responsibility (INES) – also hold important voices in the process of changing university science and engineering education to include ethical elements.

The follow-up initiatives of COMEST, born out of the recommendation of the WCS to include ethical aspects in university science curricula, produced the report titled 'The Teaching Ethics' issued in August 2003 [4]. The report asks how a researcher

> can maintain high standards of scientific integrity and quality control when the relationship between the researcher and other actors such as universities, the state, corporations and international trade organizations are changing? How can one increase the young scientist's ability to distinguish right from wrong and to feel social and environmental responsible? [5]

One of the means to do so is ethical training of science and engineering students, where the students will develop 'competence in ethics'.

Competence in ethics has to do with argumentation and offering a set of reasons or evidence in support of a conclusion. An argument is supposed to provide evidence, give us reasons to believe [6]. This competence will, if developed, equip science and engineering students with a tool to judge values and principles entangled with ethical issues/dilemmas relevant to their (future) professions. The COMEST report suggests that science and engineering students must learn the main types of ethical theories, that is, consequentialism, utilitarianism, virtue ethics, deontological theories and contractualism. If they do so, ethical competence will follow.

SCRES existed from 1996 to 2002. In addition to co-organising a session on science and ethics in the WCS, it prepared an empirical study of 115 existing ethical standards in science. The SCRES study identified existing inter-disciplinary and disciplinary ethical guidelines, codes of conduct, and principles that regulate science and engineering activities as constituting the basic ethical principles of science [7].

In the report from a symposium held in Copenhagen 2005 and organised by INES in collaboration with Center for the Philosophy of Nature and Science Studies at the University of Copenhagen, it is concluded that science and engineering students – in addition to what is mentioned above – need to

…get acquainted with global ethics (e.g. Hans Jonas' imperative of responsibility and cosmopolitanism), national and international legal regimes, and the power structures (e.g. funding and decision mechanisms) of science and technology [8].

At the Second Pugwash Workshop on Science and Society, held in Ajaccio, September 10 to 12, 2004 – where an earlier version of this article was presented – the need to provide education on ethics and biosecurity to scientists was discussed. Rather than drawing conclusions, an array of questions was raised:

Among the immediate questions raised were, whose system of ethics [are to be taught]? Who should teach? Is it possible to teach ethics without turning the instruction into ideological indoctrination? Who is to be responsible for such a course of instruction? Are there empirical studies of the impact of the courses that suggest such training would contribute to an improved environment of ethical practice? At what age should a person's ethical training start? [9]

The quotation from the proceedings of the WCS reproduced above hints that 'the ethics and responsibility of science' concerns three interacting levels: (i) a normative level in which basic ethical principles and responsibilities of science are set up, discussed, and justified; (ii) an individual level where the ethical principles are translated into responsible actions of scientists and engineers (cf. 'young scientists should …respect … the basic ethical principles and responsibilities of science'); and (iii) a structural or contextual level where the social institutions and mechanisms that surround the individual scientists and engineers are addressed, as these institutions sometimes fail to prevent 'the ethical dilemmas [scientists and engineers] may encounter in their professional lives.'

Ideal values and principles

Social mechanisms and institutions

Individual responsibility

Figure 1. Analytical model used in this paper

The analytical model of this paper, which is illustrated by the triangle shown in figure 1, tries to capture this idea. It emphasises a dialectic between the responsibilities of individuals and the surrounding social institutions and mechanisms, which again is – or at least ought to be – influenced and co-formed by ideal ethical values and principles.

An ambiguity is present in 'Science Agenda – Framework for Action': Who holds responsibility? Is it 'scientists' or is it 'science'? (Cf. the phrase 'the ethics and responsibility of science'). This ambiguity is known from Oppenheimer's famous statement:

In some sort of crude sense, which no vulgarity, no humor, no overstatement can quite extinguish, the physicists have known sin; and this is a knowledge which they cannot lose [10].

Oppenheimer talks about physicists as a 'collective'. So, who holds responsibility – individual scientists or collectives such as scientific communities? My answer to this question is: Both! Basic ethical principles guide both the formation of scientific institutions and the mechanisms that affect scientific practice and actions of individual scientists – especially when such institutions and mechanisms neglect the so-called basic ethical principles of science.

This interpretation of the 'Science Agenda – Framework for Action' document is in line with the recommendation of SCRES:

> We recommend that ethics in scientific education be strengthened. The ethical responsibility of the scientific community is ultimately borne by the individual scientists. It is she or he who decides how and whether to pursue a given line of research, what to do with the information obtained, and so on. This is not to say that the individual scientist will be fully responsible for, say, any applications of her/his results, many of which (s)he may have no power to influence, but that the ethical awareness of the individual scientist is of utmost importance. Ethical awareness is not just a matter of knowing what one considers morally adequate, but to be able to foresee and analyse elaborately different views on moral adequacy in various contexts, ultimately to form an informed opinion against that background. Ethics is more than an aspect of upbringing, it is a subject that requires studies for efficient use [11].

The ethos of science

Writings on scientific ethics sometimes focus on good scientific behaviour and set up norms and rules which should be followed by members of the scientific community in order to guarantee the credibility and truthfulness of scientific results or to discuss cases where established epistemic rules or norms are violated [12]. The archetype of good scientific behaviour is reflected in Merton's ethos of science, known under the acronym CUDOS [13].

In 1942 Robert Merton suggested that good scientific practice includes the sharing of scientific results with others, whereby everyone, whether an expert or a layperson, in principle, is able to test, challenge and use scientific results. Science is, in other words, 'communal'. Merton also argued that knowledge claims are to be tested against pre-established impersonal criteria. Science is 'universal'. The scientific communities were warned by Merton not to let their research projects be financed by power structures with special interests in the outcome of the scientific projects. Independence would, argued Merton, diminish external control and hence the distortion of scientific results. Science must be 'disinterested'. Finally Merton stated that scientists should not only be involved in the production of new knowledge; scientists are also committed to be critical towards scientific knowledge claims raised by their colleagues, and are obliged to test their colleagues' results. Hence, the peer review system plays an important part in the scientific endeavour. It gives scientific knowledge its reliability and validity, because independent peers have tested it. Science rests on 'organised scepticism'.

Merton's ethos of science is an ideal. Hence, both its formulation and justification are normative endeavours by nature. On the descriptive level it has co-formed existing scientific institutions, such as 'the scientific journal with peer review' and 'the university'. The British physicist and sociologist of science John Ziman calls knowledge production that follows the CUDOS norms 'academic science' [14].

According to Thomas Kuhn, academic science consists of two modes: 'normal' and 'revolutionary science' [15]. Normal science, which is the most predominant form of academic science, deals with riddle solving. Normal scientists compete in solving the riddles defined by the disciplinary matrix under which they work. Kuhn introduced the term 'the disciplinary matrix' in 1970, not as a substitute for a paradigm, but as a clarification [16]. Having introduced the disciplinary matrix, Kuhn described two meanings of the term 'paradigm'. The first defines a paradigm as a disciplinary matrix. Here the term is used in a broad, sociological sense to refer to the entire constellation of metaphysical beliefs, values, symbolic generalisations and techniques shared by members of a scientific community. The second, narrow sense, which according to Kuhn is the most fundamental, defines paradigms as exemplary past achievements and refers to concrete scientific solutions to scientific problems. Hence, normal scientists solve scientific riddles by using the symbolic generalisations (for example 'the laws of nature') that co-define the disciplinary matrix under which they work. The social dynamics of normal science is captured in what Henry H. Bauer calls 'the puzzle-and-filter method' [17].

When academic science is in a revolutionary mode, different paradigms compete in delivering the most adequate explanations of natural phenomena. It is, according to Kuhn, typically during scientific revolutions that new symbolic generalisations are formulated.

Today's academic scientific production is published in peer-reviewed scientific journals and books [18]. 'Peer review is a procedure or a system in which equals from the same scientific field, peers, evaluate the quality of the output, the scientific papers' [19]. (Cf. the norm of organised scepticism).

Scientific publications are – at least in principle – accessible at university libraries in paper or electronic form, whereby everyone can gain access to the fruits of science (cf. the norm of communism). Peers are expected to test the validity and reliability of knowledge claims raised in articles submitted to peer-reviewed journals, according to impersonal criteria (cf. the norm of universality). The identity of the peers and the contributor are made anonymous during the peer-review process. Hence it is not possible to favour knowledge produced by, for example, 'very important persons' (cf. the norm of disinterestedness).

Diverse points of criticism can be raised against the institution of peer-reviewed scientific journals. Commercial publishing houses, required to make a profit, publish many peer-reviewed scientific journals and books, which are becoming increasingly expensive. The increased price of scientific knowledge has fostered the criticism that the access to the fruits of academic science is restricted to the rich, though it must be admitted that not all scientific journals and publishing houses are commercial, nor that all journals or science books are expensive. Another point of criticism follows similar lines. It points to the fact that the language of scientific literature often is English, which favours native English speaking scientists.

Critics of the peer-review system have claimed that it is not without problems that peers themselves are scientists who are members of the same scientific communities as the

researchers who submit articles to be reviewed. This promotes normal science as opposed to revolutionary science and makes interdisciplinary research results difficult to publish. (This is a variant of the so-called 'Matthew effect') [20]. Indeed the peer-review system does require homogeneity and consensus regarding what is recognised as scientific knowledge [21].

It has been pointed out that no mechanism is in service that guarantees the universality of the peer review. This lack might also jeopardise its disinterestedness, and the promotion of special interests might sneak into the review. As science becomes more specialised, it might become problematic to locate competent and disinterested peers [22].

Furthermore it is not always possible for peers to validate and test results published in articles. Sometimes it is impossible to reconstruct the generation process of empirical material (the 'Andrea Doria phenomenon'), which again opens up room for scientific misconduct in the form of fabrication or plagiarism. "The demands for a 'perfect' peer review are very costly and time consuming to meet" [23].

Scientists working at a university are required to publish – in peer-reviewed journals – or perish. 'Grants are awarded, research programmes are developed and researchers appointed on the basis of peer review' [24]. I would like to note here that the downside of this publish-or-perish principle is to systematically rush researchers to fabricate, invent or plagiarise empirical material.

Also applications to research positions at universities and doctoral theses handed in at universities are peer reviewed, though neither the identity of peers nor applicants/graduate students are kept anonymous.

The Danish philosopher Hans Fink has formulated what I elsewhere have called 'the ethos of the university' [25]. It consists of five principles:

- Close connection between research and university education
- Freedom of research. The freedom concerns the choices of
    - the research problem
    - the research process
    - the publication strategy
- Freedom of teaching
- Self-governance
- The unity of science

Finks's ethos of the university especially emphasises the CUDOS norm of disinterestedness and the principle of self-governance addresses the quality aspect of scientific knowledge.

Scientists working at universities are guided by the ethos of academic science. University scientists are paid to do disinterested research; they are expected to produce scientific insight for non-instrumental reasons. They are also expected to publish their findings in peer-reviewed journals. But university scientists are not only researchers. They are also teachers of students, advisors of politicians, consultants to companies, communicators to the public – and hopefully also responsible citizens, etc. These activities are also guided by sets of norms, which might contradict the ethos of science. Hence I do not imply that the producers of academic scientific knowledge in all aspects of their professional lives follow Merton's ethos of science, nor that scientific communities do not also encompass counter-norms [26].

The CUDOS norms have also co-formed other institutional mechanisms that structure the work of academic scientists: the principles of Good Laboratory Practise (GLP) [27], Good Clinical Trial Practise (GCP), and Committees on Scientific Dishonesty [28], etc.

The institutional mechanisms inspired by Merton's ethos of science adopt the distinction between 'the context of justification' and 'the context of discovery' suggested by Reichenbach in 1938 [29]. Scientific arguments need to be universally valid and reliable. The specific (social and psychological) context in which research results were obtained is considered irrelevant.

Originally this distinction was put forward to distinguish between the sphere of validity and reliability and the sphere of individual creativity. This distinction is important as it decouples the inter-subjectivity of scientific argumentation from the subjective process of construction.

However, the distinction between the context of justification and the context of discovery also decouples scientific argumentation from the selection process of problems that are to be scrutinised scientifically. This might be a problem if the distinction between academic science and its applications can no longer be up-held:

> [T]he distinction between pure [academic] and applied science is a remnant of the distant past when scientific research was completely divorced from day-to-day life, and practical applications that could have resulted from academic research were remote in time and space. It would take decades before an application was found, and then it would have been taken up by different people, mostly engineers, in polytechnics or industrial laboratories.
> Nowadays, the distinction is hardly discernible. Practical applications often follow immediately after scientific discoveries, and are pursued by the same people. University scientists are encouraged to do applied research, to enable them to be financially self-sufficient [30].

It is not straightforward to explain why academic science is mixing with its practical applications, but I think it is related to the fact that academic research is constantly in need of more and more funding [31]. The reason is partly that scientific instruments are becoming more sophisticated, and hence more expensive. Increased research appropriations on public budgets create high utility expectations. Academic science is exposed to an external pressure of becoming more instrumental.

Also intra-normal scientific forces might pressure academic science in an instrumental direction. The number of scientific sub-disciplines, which are in their phase of finalisation, is increasing. A sub-discipline is in a state of finalisation if the set of exemplary uses of its symbolic generalisations is almost fully developed. The result is that the focus of these sub-disciplines becomes more instrumental, as only few pure academic problems are left for scientists to solve.

Merton's ethos of science regards the context of justification, and sets up a mechanism that ensures that the quality of scientific knowledge claims corresponds to specific intra-scientific quality criteria. It poses no direct restrictions on which questions are to be scrutinised by academic science. If we also recognise that normal science is the most predominant from of academic science, (at least) four consequences follow:

The first one is that it is the scientists' fascination of solving scientific riddles that drives normal science forward. The second is that it is the scientific communities that identify which scientific riddles are most prestigious to solve. The third feature is that normal research does not aim at solving 'the really pressing problems, e.g. a cure for cancer or the design for a lasting peace, [which] are often not puzzles at all, largely because they may not have any solution' [32]. The fourth consequence is that ethical aspects are decoupled from the choices of problems undertaken by scientists doing normal science.

However, it does not follow that the ethos of science or the scientific peer review system constitute the only set of norms/mechanisms that ought to guide academic science. In a celebrated paper, Funtowicz and Ravetz distinguish between four kinds of scientific activities: 'core science' (equivalent to academic science), 'applied science', 'professional consultancy', and 'post-normal science' [33]. The latter category of scientific activities denotes an approach to handling problems characterised by both high system uncertainties and high decision stakes.

The point I want to make is that post-normal science indeed is aimed at handling 'the really pressing problems' (which Funtowicz and Ravetz call 'policy issues'), for example those of risk and environment. Without going into details of the features of post-normal science, I note that post-normal science is 'not merely politics or public participation' [34]. It is an activity that encompasses scientific input into the problem-solving strategy of 'the really pressing problems'/'policy issues', without reducing it to that:

> Out of all this must come a set of forecasts which will provide the scientific input to decision processes; these will contribute to policy recommendations that must then be implemented on a broad scale. But all the causal elements are uncertain in the extreme; to wait until all the facts are in, would be another form of imprudence [35].

When normal science is seen as part of a post-normal problem-solving strategy, it couples normal science and ethical aspects. Some scientific riddles are more important to solve than others, when they are used as part of a decision-making process aimed at promoting public health, disarmament, or sustainable development, etc. In the post-normal problem-solving strategy extended peer review communities identify relevant research questions. Also other kinds of mechanisms can be used to identify such key-questions.

Now I return to the analytical model of figure 1. So far I have argued that the CUDOS norms constitute the ideal of academic science, which again, and to some extent, is realised in the social mechanisms and institutions of academic science (for example peer-reviewed scientific journals). These institutions affect the actions of academic scientists, as they are rewarded or punished when they respectively act according or violate the rules of these institutions.

I have also argued that there is not always a one-to-one correspondence between the ethos of academic science and existing academic scientific institutions. And it is here where 'the academic responsibility' of scientists enters the picture.

When confronted with contradictions between the ethos of academic science and existing academic institutions, scientists have an academic responsibility to act according to the ethos of science, instead of according to the practises of the existing institutions (though this is properly not beneficial to their academic careers).

Let me exemplify this point by referring to the discussion of peer-reviewed journals. I argued that the commercialisation of the academic press, and the fact that they usually are written in English, might contradict the norms of communism and universality. As I pose this criticism, responsibility is put on my shoulders regarding where I submit my research papers. I ought not to publish papers in the most expensive and commercial journals, nor only publish in English. (My mother tongue is Danish, and I am responsible for keeping this language alive as a research language – at least until all congenial Danish citizens speak English.)

I also mentioned that there exist no institutionalised impersonal principles that guide peers. Thus the norms of organised scepticism and disinterestedness could be violated. When I myself act as a peer, this criticism commits me explicitly to formulate the principles after which I intend to carry out my peer review.

Academic scientists are responsible not to put their discipline above everything else. In other words, they are obliged to reflect on the boundaries of the ideals that constitute the guiding principles of their work – for example to reflect on the limits of the CUDOS ethos. When should, for example, my actions be guided by the ethos of science, and when ought complementary sets of norms guide my actions?

Earlier I mentioned that scientists working at universities have many functions. Hence university scientists should not always be guided by the ethos of science. (A student should be treated differently than a contributor to a peer-reviewed journal.) This kind of iconoclastic reflection does also apply to the research process. I question whether the CUDOS norms can determine the (social) relevance of research questions, and argue that Merton's ethos of science only regards the validity and reliability of scientific results. It ought not address the selection process of scientific problems that are to be treated by academic science.

Misuse of science

In the SCRES background paper for the WCS, 'Ethics and the responsibility of science', the issue regarding the choices of research problems that scientists work on is taken up:

> In exchange for public funding, scientists are committed to contributing to finding solutions to the most pressing problems in society today. Investment in science is predicated upon the expectation of some return to society. The question is, what? Much of the investment in science in this century has been motivated by wars (World Wars I & II, the Cold War, and numerous other military interventions). In a more peaceful world, other scientific returns would be expected. Most important is perhaps to move towards a more sustainable biosphere that is simultaneously economically feasible and ecologically sound. Many in the scientific community demand that this sustainable biosphere should also be socially just [36].

A similar argument can be put forward regarding scientists funded by private companies. In both cases sponsors want 'value for their money'. The view expressed in the quotation is not necessarily in contrast to Vannevar Bush's social contract between science and society that defines the domain in which Merton's ethos of science applies [37]. It broadens up the perspective to also include other kinds of knowledge production. Bush's contract between science and society states that society through the state finances academic science and gives it

autonomy to freely choose its research questions and methods, to set up university curricula and other recruitment mechanisms. In this way the state provides the fuel for the reproduction of academic science. In return for this fuel, the state expects that the scientific communities make their knowledge production available as a public commodity. As spin-offs of academic science, both democratic processes and economic development are said to be stimulated.

The list of examples where science and technology have benefited humanity is long. The improvement of our health, our food, our houses and our schools is based on scientific and technological achievements. Expressed more elegantly in the words of Sir Joseph Rotblat:

> Infectious diseases that killed so many in infancy and young age, are now a thing of the past. The average life-span has generally increased dramatically. Greatly improved techniques in agriculture have made it possible – at least potentially – to provide food for the world population, even though the world population has been growing very fast as a result of better health and hygiene. New industrial technologies applied in factories and mines have largely removed the drudgery and mindlessness of labour, as well as reducing working hours and increasing safety standards. The products of the new industrial technologies have also lessened the chores of day-to-day life, such as housing amenities, food preparation and materials for clothing. The fantastic progress in communication and information has given more and more people access to the great cultural achievements—to books, concerts, museums, as well enabling them to keep in touch with current events via radio, television and the Internet. All this has made it possible for them to be more actively involved in the life of the community, whether at local, national or world-wide level. Altogether, people nowadays are much healthier, more affluent, better educated and informed, and thus more disposed to live in peace with one another, than at the beginning of this century. And, as I said, all this came about mainly as a result of the application of science to day-to-day life [38].

Despite the positive impact on human affairs, science and technology are sometimes, deliberately or unintentionally, misused [39]. At the 1st Pugwash Workshop on Science, Ethics and Society, held in Paris in June 2003, this issue was discussed. This workshop's report states that

> [a] number of legitimate scientific research activities are of dual use, with both civilian and military applications, and in these cases an evaluation of whether to pursue them always has a moral element. One of the greatest concerns at present is biotechnology [40].

The focus of the work of the Pugwash Workshop Series on Science, Ethics and Society is not so much on the accountability of scientific results, as it is on deliberate or unintentional harmful applications of scientific discoveries. Hence this perspective on science adds something qualitatively new to the approach of Robert Merton. The premise for this perspective is, of course, that the scientific results in question influence the environment or society. When this is the case, social regulation of scientific activities becomes topical. Social regulation of deliberately or unintentionally misused of science is not only an intra-scientific responsibility (cf. Functowicz and Ravetz' concept of extended peer review), though scientific

communities and networks have progressed substantially in this regard (cf. Kathinka Evers' report: 'Standards for Ethics and Responsibility in Science: An Analysis and Evaluation of Their Content, Background and Function' [7]).

The dialectic between individual responsibilities and appropriate mechanisms of social regulation provides us with a fruitful framework for dealing with the issue of the misuse of science. Scientists and engineers ought to choose not to get involved in creating or applying scientific knowledge associated with the development of, for example, new weapons; but if no social mechanisms are set up to prevent such applications, nothing much is gained at the accumulated social level. (If one scientist chooses not to do it, another one probably will).

The Chemical Weapons Convention (CWC) is an example of a social mechanism that has been set up by the international community to prohibit one 'important and very dangerous kind of weapons of mass annihilation, committing the State Parties to the destruction of the chemical-weapons stockpiles and the production facilities' [41]. The 'international community' refers to 175 national state parties, who have signed and ratified the convention. Scientific expertise plays an important role in the processes leading up to and ensuring fulfillment of the treaty. However, such scientific activities are not 'pure', and remain intimately entangled with politics.

The CWC also set up an 'ethics project', maintained by the Organisation for the Prohibition of the Chemical Weapons (OPCW), which tries to promote peaceful uses of chemistry. On the official website of the OPCW, the ethics project is described as follows:

> The Ethics Project seeks to develop links with academic research centres, educational and other relevant institutions and organisations, as well as entities affected by the Chemical Weapons Convention to promote an awareness of the ethical dimensions of the Convention [42].

In 2004 and 2005 the ethics project of the OPCW progressed substantially, as collaboration with the purely scientific organisation IUPAC was established. In July 2005 OPCW and IUPAC met twice to discuss education and outreach regarding chemical weapons. The objective was to increase awareness of the Chemical Weapons Convention and its requirements within the chemical scientific community, via integrating issues related to the CWC and its implementation into chemistry teaching and setting up appropriate codes of conduct of chemists and chemical engineers [43].

Other examples of international treaties, agreements and judgements that intend to regulate the selection process of scientific R&D projects are:

- Advisory Opinion of the International Court of Justice on the legality of nuclear weapons [44]
- Biological Weapons and Toxin Convention [45]
- Convention on Biological Diversity [48]
- Cartagena Protocol on Biosafety [46]
- Comprehensive Nuclear-Test-Ban Treaty [47]
- Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects [49]

- Convention on the Prohibition of the use, stockpiling, production and transfer of antipersonnel mines and on their destruction (Mine Ban Treaty or Ottawa Convention) [50]
- International Convention for the Regulation of Whaling [51]
- Montreal Protocol on Substances That Deplete the Ozone Layer [52]
- Stockholm Convention on persistent organic pollutants (POPs) [53]
- Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies. (The Outer Space Treaty) [54]
- Treaty on the Non-Proliferation of Nuclear Weapons [55]
- United Nations Framework Convention on Climate Change. (The Kyoto Protocol) [56]

What kind of scientific insight and technological applications of scientific results can be characterised as desirable or ethical? The list above of treaties and agreements suggests that scientific knowledge and its applications ought to be peaceful and environmentally sustainable [57]. However, it must be noted that the selection of treaties included in the list above is to some extent coincidental (my knowledge of existing international conventions is limited) and normative (e.g. the WTO's Agreement on Trade-Related Aspects of Intellectual Property Rights is not included in the list, as I do not consider it reflecting an ethical ethos [58], though the paragraphs 4 to 6 of the Doha Ministerial Declaration on trade-related aspects of intellectual property rights and public health do reflect a concern for the socially unjust distribution of the fruits of techno-science – an aspect which is neglected by international law) [59]. Only multilateral treaties have been included in the list, excluding for example the Threshold Test-Ban Treaty [60].

The SCRES identifies four areas of potential ethical concern that deserve a close investigation regarding their ethical underpinning [61]:

- Science crosses new borders, and hereby calls fundamental ethical views into question. This point focuses on the tension between 'good' and 'bad' uses of new scientific concepts, theories and methods. Who is to determine what is good or bad: Scientists? Politicians? The general public? The challenge is to construct a coherent ethical position that covers a wide variety of related issues.
- Science and Power. Here, the focus is on the interfaces of science with economic and political powers.
- Science, Welfare and Equity. This deals with the question whether science and technology should help overcome global inequalities. Attention is also put on the concepts of 'social responsibility' and 'justice'. What these concepts refer to differs depending on what type of society we talk about.
- Scientific Uncertainty. How can scientific idealisation and abstraction deal with problems characterised by high system uncertainties coupled with high decision stakes (e.g. ecological factors). This provides for new challenges with regard to ethical issues.

One might ask if an ethos, some set of basic ethical principles, has been formulated to which we can refer when we analyse these 'new' ethical dilemmas? In his book *Hope in a Dark Time: Reflections on Humanity's Future*, David Krieger has collected a number of declarations and statements that capture different aspects of an ethical ethos appropriate for dealing with the ethical dilemmas that have emerged from the techno-scientific development. The declarations and statements included in Krieger's book are the following [62]:

- Universal Declaration of Human Rights (adopted by United Nations General Assembly, 1948).
- The Declaration of a Global Ethics (discussed at the Parliament of the World's Religions in Chicago, 1993).
- The Earth Charter (formally launched in 1991 after a 12 years grassroots drafting process).
- The Russell-Einstein Manifesto (the moral foundation of the Pugwash conferences).
- Appeal to End the Nuclear Weapons Threat to Humanity and All Life (the appeal has been signed by many prominent leaders of our time and Nobel laureates).

One could add to the list the Groningen Manifesto (adopted by the Symposium *Sharing the Planet*, organised by the Dutch chapter of Pugwash) [63] and the Charter of Human Responsibilities (proposed by Alliance for a Responsible, Plural and United World) [64].

International law does not directly refer to the literature of philosophical ethics. Maybe this is caused by the fact that global ethics is not a huge ethical discipline, though it is growing (in 2003, for instance, Margaret Somerville was chosen as the first winner of the Avicenna Prize for Ethics in Science). Here I will argue that Hans Jonas' book *The Imperative of Responsibility* offers an appropriate ethical theory which could be used as a global ethical theory underpinning international law regulating techno-science.

Hans Jonas sets up an ethics for the technological age. The starting point of Jonas' theory building is the fact that the human condition has changed dramatically with the growing importance of techno-science in modern societies. This changed condition gives rise to a new ethics – an ethics for the technological age. The ethics of the 'old' age can, according to Jonas, characterised be characterised as follows [65]:

1. [A]ction on nonhuman things did not constitute a sphere of authentic ethical significance.
2. Ethical significance belonged to the direct dealing of man with man, including the dealing with himself: all traditional ethics is 'anthropocentric'.
3. For action in this domain, the entity 'man' and his basic condition was considered constant in essence and not itself an object of reshaping 'techne'.
4. The good and evil about which action had to care lay close to the act, either in the praxis itself or in its immediate reaction, and were not matters for remote planning.

Kant's categorical imperative is an example of an ethical ethos of the 'old' age. It says, in one of its formulations, 'Act so that you can will that the maxim of your action be made the principle of a universal law' [66].

Now, the traditional characteristics have changed, and a new imperative emerged:

> An imperative responding to the new type of human action and addressed to the new type of agency that operates it might run thus: "Act so that the effects of your action are compatible with the permanence of genuine human life"; or expressed negatively: "Act so that the effects of your actions are not destructive of the future possibility of such life"; or simply: "Do not compromise the conditions for an indefinite continuation of humanity on earth"; or, again turned positive: "in your present choices, include the future wholeness of Man among the objects of your will" [67].

Jonas' imperative differs from Kant's: The reference of Kant's imperative is the individual will, but 'the new imperative addresses itself to public policy rather than private conduct, which is not in the causal dimension to which that imperative applies' [68]. Another difference between the new and the old imperative is that the new imperative

> adds a time horizon to the moral calculus which is entirely absent from the instantaneous logical operation of the Kantian imperative: whereas the latter extrapolates into an ever-present order of abstract compatibility, our imperative extrapolates into a predictable real 'future' as the open-ended dimension of our responsibility [69].

Thus also knowledge-based forecasts about possible futures become an intrinsic part of the ethical endeavour.

In short: the existence of humankind must never be put at stake. "Herewith we have at last found a 'principle' that forbids certain technologically feasible experiments" [70]. Jonas warns us against two types of potential unethical developments. 'Never must the existence or the essence of man as a whole be made a stake in hazards of action' [71]. The ban against annihilation of humankind is the core of the Russell-Einstein manifesto of 1955:

> Remember your humanity, and forget the rest. If you can do so, the way lies open to a new Paradise; if you cannot, there lies before you the risk of universal death [72].

The presence of concepts such as medically [73] and genetically [74] enhanced 'normality' makes us aware of the possibility to change the essence of humankind.

International conventions related to scientific knowledge and its applications regard deliberate harmful applications of scientific knowledge. Future unintentional harmful consequences of the techno-scientific development can hardly be prevented via targeted laws and institutions.

To prevent such unintentional consequences, it has been suggested that policies be adopted in accordance with the so-called 'precautionary principle', which states that if the development of a technique includes a potential risk, development of that technique must be stopped even if its risks are not scientifically proven. This principle is referred to as the basis for the environmental policies of European Union and plays an increasing role in developing health policies as well [75].

An explicit manifestation of the precautionary principle is the EU moratorium on GMOs which was in effect from 1999–2003. Since the spring of 1998, no new GMOs had been authorised for planting or use in the EU. This 'de facto' moratorium was made 'official' at an EU Environment Ministers Council meeting in June 1999 when five Member States – Denmark, France, Greece Italy and Luxembourg – issued a declaration that they would effectively block new GMO approvals until the European Commission proposed legislation for traceability and labelling of GMOs and products derived therefrom.

Following the revision of the Deliberate Release Directive regulating the release of GMOs into the environment (Directive 2001/18/EC repealing Directive 90/220/EEC, adopted by the European Parliament in February 2001), these five countries, subsequently joined by Austria, again declared that they would not lift the moratorium until the issue of traceability and labelling was resolved. The moratorium had been consolidated by similar declarations from Germany (October 2001) and Belgium (December 2001) [76].

Another mechanism that might help prevent unintentional consequences of science and technology is the establishment of early warning committees [77]. At the 53rd Pugwash Conference on Science and World Affairs: Advancing Human Security – The Role of Technology and Politics, working group 5, discussing the issue of 'New Technology for Human Development and Security', recommended that

> [a] working group at the next year's Pugwash conference in South Korea on the topic "Early warning and preventive action on emerging technologies" should be established. Topics within such a working group could be: the character of the early warning institutions, and the scientific analysis of examples of potential threats from emerging technologies – downside consequences of nanotechnology, biomedical technology etc., and security and privacy issues related to ICTs (Echelon etc.). The analysis should include contextual aspects (commercial, religious, and ideological etc.) surrounding emerging technologies, as well as account for the epistemological and historical meta-assumptions on which they are built [78].

The successful design of early warning committees – capable of predicting harmful unintentional consequences of the techno-scientific development – is, however, not an easy challenge.

Before I turn to issue of 'the social responsibility' of scientists, let me sum up this section. Techno-science has societal impact, which its patrons are well aware of. The impact of science and technology on society is dialectical, i.e. good and bad. Above, I first addressed one of the corners of figure 1 – the social mechanisms that have been set up to handle the dialectic of scientific R&D. Then I turned to the second corner of the triangle, and discussed what kind of ethos (if any) is behind the social mechanisms of science. Hans Jonas' imperative of responsibility was introduced in this context.

So what kind of social responsibility of scientists is associated with what has been said so far? First of all, scientists and engineers are committed to conscientiously object to involvement in certain research projects. This might not be without personal sacrifice (cf. the 11 years of imprisonment of the Iraqi scientist Dr. Hussain Al-Sharistani after he refused to work on Saddam Hussein's weapons programme, to mention an extreme case) [79].

If Hans Jonas' ethical ethos is an appropriate one – and I think it is – then the social responsibility of scientists is closely related to their scientific competences and technological abilities. Again I turn to Sir Joseph Rotblat for an exact formulation. In an article entitled 'The social responsibility of scientists' Rotblat, with Sir Michael Atiyah (who succeeded him as president of Pugwash), put forward three points [80]:

- Scientists will understand the technical problems better than the average politician or citizen, and knowledge brings responsibility.
- Remember this, that you have knowledge and you are responsible for how this knowledge is properly used. Scientists can provide technical advice and assistance for solving the incidental problems that may emerge.
- Scientists can warn of further dangers that may arise from current discoveries. Scientists can form an international fraternity that transcends beyond natural boundaries, so they are well placed to take a global view in the interest of mankind.

To these points I want to add that scientists also are socially responsible to reflect on, and discuss, in the so-called 'international fraternity of science', the constitution of the ethical ethos that guide their actions. A socially responsible scientist or engineer also addresses how his or her ethical ideals are mirrored in codes of conduct and national, regional and international legal regimes. Existing codes, treaties, agreements and conventions might not be sufficient, and may well be in need of change, new ones might be required for handling the techno-scientific development or they may be (systematically) violated. Scientists hold a responsibility to raise their voices in these regards.

Whistleblowers

A whistleblower is a person who publicly reveals criminal or unscrupulous actions in his or her working environment, or divulges suppressed and distorted information about dangers to human health and the environment [81].

In Michael Mann's motion picture *The Insider*, the 'true' story of whistleblower Dr. Jeffrey Wigand is told [82]. After Dr. Wigand stops as head of a research and development department at the 'Brown and Williamsson Tobacco Company', he decides to go public with the suppressed information that Brown and Williamsson enhance the addictive effect of tobacco, not by spiking it with additional nicotine, but by manipulating it using ammonia-chemistry. The nicotine is 'impact boosted' – it is converted into a form that is more rapidly absorbed in the lungs and hence in the brain and central nervous system.

To prevent Wigand from blowing the whistle, his former employer threatens him financially by promising that monthly payments will be cancelled and that prosecution for breaking a confidentiality agreement will be initiated. When these threats do not stop him from getting in contact with Lowell Bergman, a journalist at the CBS program '60 minutes' and former student of Herbert Marcuse, other kinds of harassment begin. Wigand is spied on, he receives threats on the lives of himself and his family, and lies about his past are leaked to the press.

As the story ends, the unscrupulous actions of Brown and Williamsson have been revealed to the public. But by that time Wigand has lost his job, his wife and children have left him, and

his personal life has been scrutinised in public. Being a whistleblower is not without personal sacrifice!

Sometimes whistleblowers are sent to prison. This was the case for Mordecai Vanunu, after he revealed in 1986 Israel's atomic secret to the London-based newspaper *The Times*, and made it clear to everyone that Israel had joined the un-official nuclear club. After having been tricked to fly to Rome and subsequently abducted by MOSSAD agents, he received an 18-years sentence for espionage. On April 22nd 2004, Mordecai Vanunu was released from prison [83].

As mentioned earlier, scientific results produced at universities are entangled with social processes that support their reliability and validity. The situation is very different for knowledge produced and applied elsewhere, for example in private companies and military research institutions. Here Merton's ethos of science is not in service, as knowledge produced in private or military research laboratories is not necessarily made public, and therefore cannot always be tested systematically by the scientific community [84].

Not all scientists and engineers work under university-like conditions, where they would normally be allowed to freely publish their findings; furthermore, many scientists working in non-academic environments are not permitted to be completely transparent with regard to their (methodological) foundations. Hence, due to the lack of appropriate social structures, we cannot take for granted the trustworthy nature of the knowledge claims raised by 'non-transparent' sources – such as the research laboratory of a tobacco company or a governmental institution defending state policy – nor can we assume that we are always told the whole story.

Trust in knowledge claims posed by 'non-transparent' institutions, where the ethos of science is not a guiding principle, could be gained if an alternative social mechanism was set up to prevent such institutions from holding back vital information from the public, or distorting it before it is made public. Here I want to suggest that whistleblowing can constitute such a mechanism. The argument is that it will not be in the self-interest of 'non-transparent' institutions to act in unethical ways if they risk whistleblowers' disclosures.

For whistleblowing to become institutionalised as a social mechanism that minimises unethical behaviour in closed research settings, I think several conditions need to be fulfilled: First of all, the lives of whistleblowers must not be destroyed after blowing the whistle. Only few persons will do that if the most likely consequence is personal destruction. Harassment of whistleblowers could be minimised if laws were passed that explicitly protect whistleblowers.

In September 2003, the Association for the Promotion of Scientific Accountable Behaviour (APSAB) organised a conference where firstly the establishment was discussed of an international convention which would state that a 'conscience clause' must be included into the labour agreements between employers and worker representatives:

> The conscience clause entitles any scientist or engineer employed by any private or public organization and having duties or responsibilities in the field of science or technology to report to an independent body in the country in which the organization's headquarters or the headquarters of its parent company are located, [about] any and all activities undertaken in ongoing and deliberate breach of:
>
> - The precautionary principle;
> - Public health;
> - The environment;

- Ethical and professional codes regarding scientific research and technological production [85].

At the conference, representatives from scientific organisations, national bodies, international organisations, economic and industrial organisations, and labour organisations gave their view on the idea of a conscience clause. At APSAB's homepage all conference presentations are accessible in written form [86]. Secondly, an independent institution needs to be set up that can control the truthfulness of accusations raised by whistleblowers. The institution needs a team of trusted inspectors that have the power to investigate and evaluate whistleblowers' allegations. Thirdly, scientists and engineers must feel obliged to blow the whistle when they encounter wrongdoing. The seed to this feeling can be sowed in ethical training programs for science and engineering students. Hence I have now returned to the starting point of this article.

In this section I have introduced the concept of the 'whistleblower', and argued that social mechanisms need to be set up (i) to protect people who blow the whistle, and (ii) to help validate and support their claims. In closed research settings, the whistleblower idea reflects both academic and social responsibilities of scientists. A whistleblower does not only act in a socially responsible way. (S)he also actualises the academic responsibility within non-transparent research settings, as whistleblowing may increase the credibility of knowledge claims originating from closed research settings.

Conclusion

In this paper I have applied an analytical model of the relations between the ideal ethical values of science, science's social mechanisms and institutions, and individual responsibility of scientists and engineers to two cases, and thereby illustrated its usability. The first example concerns Merton's ethos of science, how it materialises in appropriate social mechanisms and institutions, and translates into academic responsibility. The second example looks at misuse of science, as it balances Hans Jonas' imperative of responsibility with international law and scientists' social responsibility.

I conclude that within the academic sphere scientists hold a responsibility to produce credible, transparent scientific knowledge that is not twisted by external interests. When producing academic scientific knowledge scientists are required to follow Merton's ethos of science. Usually the institutions of science insure that the ethos of science is followed, but in concrete situations scientists are responsible to reflect whether this is actually the case. Scientists also need to know the limits of the ethos of science, and to realise that it only applies in the context of justification.

When the techno-scientific development affects the environment, human health and our social settings, it needs to be governed by societal regulation mechanisms. Hence, techno-scientists are required to follow ethical principles, e.g. Kant and Jonas's moral imperatives – though their social responsibility also encompasses reflections on these guidelines. Furthermore, scientists and engineers are obliged to reflect on existing regulation mechanisms and institutions (such as national, regional and international law), and ask whether these mechanisms and institutions satisfactorily mirror ethical principles, or need to be sharpened.

Acknowledgements

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Ecological security: a 'more imaginative' response involving youth

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The Netherlands Pugwash Group, together with International Student/Young Pugwash (ISYP), has initiated a Pugwash Study Group on New Challenges to Human Security [1]. In calling their first Pugwash Workshop and ISYP pre-workshop, which were subsequently held in Wageningen, The Netherlands from 16-18 June 2006, the organisers identified the theme of 'environmental security' as one of the foci of that workshop [2]. They observed both that a long-term approach to human security necessitates the inclusion of environmental concerns in present policy making, but also that there is a clear reluctance to do so.

The Wageningen Call continued: 'We would like to venture that a more imaginative response is needed'. The organisers went on to provide four reasons: (a) environmental (really ecological) tensions are likely to rise due to further environmental degradation and the lack of remedial public action, (b) sub-national problems may soon affect national levels, (c) our desire to show responsibility towards future generations, and (d) shared environmental (ecological) resources and problems may help bridging divides in society and thus become a vehicle for peace.

The Wageningen Call also asked for a pragmatic approach to, and framing of, the issues, that works towards practical solutions – 'resolutique' instead of only 'problematique' and 'knowledge for action' rather than only 'knowledge for understanding'. In response to the call, I participated in both ISYP and Pugwash workshops. In the ISYP Workshop I presented my views on this issue, which are briefly outlined in this comment.

While I concur with the need for the 'resolutique' and action, I also believe that the former is effective only when the nature of the problem has been grasped. If we first make the effort to understand the 'problematique', our 'knowledge for action' may lead us to find solutions that had yet to be considered. So, I begin with a review of my understanding of the 'problematique' and then proceed to an attempt at an imaginative 'resolutique'. I will describe the approach that I am currently developing with Our Task, Inc. [3].

The 'problematique' the 'resolutique' is to resolve

The Wageningen Call offers some helpful commentary on the nature of the 'problematique' as it relates to ecological security.

1. Environmental issues tend to have a long 'incubation' period before they become a threat to human security.
2. Even if appropriate remedial measures are taken, the time for recovery is long and exceeds the time scale of most decision makers.
3. If species are lost or ecosystems are destroyed, recovery within human time scale is impossible.
4. Environmental (ecological) degradation and natural resource scarcity contribute to migration and conflicts and deprive future generations of unique resources of which we cannot know the value.
5. These losses may impose severe constraints on future societies.
6. While a long-term approach to present policy making for ecological security is self-evident, the short-term timeframes of politicians, economic considerations, and a discourse of 'national interest' tend to push the ecological agenda down the ladder of policy priority.
7. All the above characteristics contribute to the lack of urgency for environmental (ecological) issues at the present juncture and to the overall trend where they are losing prevalence in policy and public discourses.
8. However serious the costs may be to future generations, these do not form a constituency to which decision-makers feel responsible or which can hold them accountable.

To this assessment I would add that (a) humans continue to see themselves as being separate and distinct from an 'environment' rather than as being an integral part of an 'ecology' consisting of the whole community of life on Earth; (b) that humans have no sense of identity as a species and no framework for inter-species ethics, and (c) that the dominant human sense of proper relationship with Earth is that of 'use', and (d) that human numbers and expectations continue to grow.

A 'resolutique' for the 'problematique'

The particular issue at hand is that, until recently, it has seemed to us humans that Earth was so enormous that we could never change it in any significant way. But, as Peter Vitousek et al. wrote, 'In a very real sense, the world is now in our hands' [4].

A fundamentally challenging issue is that we have not designed our decision-making systems appropriately to manage the planet that 'is now in our hands'. The current system is based on the concept of sovereignty of nation-states, meaning that states have a monopoly on the use of power and no power on Earth can compel a nation-state to do something it does not wish to do [5]. Such a system does not recognise the reality of a borderless, integrated planet. Nor does it address the long time constants associated with global ecological developments. Nor does it represent the interests of the other-than-human beings or even the

interests of future generations of human beings. And what little global decision-making capacity we have is not supported by an overarching authority or by any ability to enforce global decisions.

Even more difficult is the fact that while our religious and spiritual traditions have evolved elaborate systems of human-human ethics, they have relatively little to offer by way of interspecies ethics. For the most part, we human beings do not think of ourselves as a 'species' and we have no widely accepted ethical or moral guidelines mediating our relations with other-than-human beings. Such a code is in need.

To the degree that humans have an agreed upon 'resolutique' for the 'problematique' it consists of the Millennium Declaration, the Millennium Development Goals, and the Millennium Project Report. The Millennium Development Goals and the action plan for their implementation (the Millennium Project Report) are constructive steps for they can lead to some important accomplishments if the industrialised countries actually contribute the funds and change their policies as recommended in the Millennium Project Report. That said, however, the Declaration, the Development Goals, and the Project Report are not a 'resolutique' for the simple reason that they do not address the 'problematique'. A central aspect of the 'problematique' is that the human species must find an appropriate niche in the ecology of the whole community of life. The whole community of life is primary; humans are secondary. In the MDGs, humans are primary and the ecology of the whole community of life is only an afterthought.

Indeed, we humans are the conscious part of Earth that has learned the thirteen-thousand-million year history of how the community of life on Earth came to be. We, as a species, have learned that collectively we control not only our own fate but also that of the whole community of life. But until we comprehend who we really are, all of our discourses will be a problem in themselves, and we will be ineffective in framing either problems or solutions. One need go no further than the word 'environment' for an example of a difficult discourse related to human identity. We use the word 'environment' to say that there is us – human beings – and there is our 'environment' – everything else. Part of the 'resolutique' must be to strike the work 'environment' from our dictionaries and edit all of our writings to replace this word with 'ecology' and the knowledge that we are one species integral with the whole community of life. Our principle challenge now is to find our niche in the ecology and discipline ourselves to live within the limits of our niche.

A similarly problematic part of our discourse is the concept of 'sustainable development'. The Brundtland Commission's definition [6] was problematic because it entailed an anthropocentric perspective. Over time, the term has come to mean making the minimum possible change to avoid killing the current human population while allowing population and material through-put to continue to grow. This is not an adequate or sustainable human goal. And there are many other words needing clarification, among them 'progress', 'earth' (versus 'Earth'), and 'profit'. In my opinion, we will not get beyond our problematic discourses until we are clear about who we are and the assumptions and paradigms behind the words we use.

By shifting the focus of our discourse to culture we can begin to clarify the terms of the discourse and the magnitude of the task ahead. We can begin thinking about the nature of culture and how it develops. We can think about the agents of cultural change and how they might be brought to an understanding of the 'problematique' and to collaborate in defining and achieving the 'resolutique'.

In my view the 'resolutique' can be nothing less than a global culture unified by a species-wide goal of a mutually enhancing relationship between humans and Earth [7]. Anything short of this is not the 'resolutique' but only problematic discourse.

Roles for scientists

Scientists and academics have special roles to play in achieving a mutually enhancing relationship between humans and Earth. They can

- Help us to perceive the large, integrated picture of the human condition, not just individual specialties.
- Help us to remember the continuing menace of nuclear weapons and nuclear knowledge.
- Help us recognise the menace of other technologies of mass impact.
- Help us develop the systems-oriented, interdisciplinary tools that are needed in the perpetual task of managing Earth.

Roles for academics

Of all the culture-shaping establishments, none has a more important role to play than the university. The university has a significant influence on the world view of all human profes–sionals – lawyers, scientists, physicians, etc. Here are a few suggestions:

- Green the physical plant, the curriculum, and the research of each campus. Many campuses do not set an example of sustainable living, and many universities have been for decades a place to go to learn how to destroy Earth, not save it.
- Develop a required course for all entering students on the history of the universe and the role of the human in the universe.
- Include system dynamics in the curriculum [8]. This way of thinking is essential to developing the policy tools needed for managing the complex, non-linear, feedback systems of social and ecological systems [9].
- Develop partner relations with universities in developing countries.

The role of Pugwash and ISYP

Pugwash has already made enormous contributions in helping humans to live with nuclear knowledge. If it were not for the quiet work of Pugwash, it is possible that by now humans could have used nuclear weapons to destroy their cultures and much of life on Earth. Now, new global threats have come along. Especially significant is the accelerating human assault on Earth.

Pugwash has embraced the discussion on new global threats. The Wageningen Call, for example, covers two issues of conflict in an era of terror and environmental security. Pugwash can usefully work on these two issues more or less independently, as other groups are, but it seems to me that a unique contribution that Pugwash could make is to give attention to the interrelated nature of these two sets of issues. A driving factor for the desperation that contributes to terror is the growing awareness that 'development' has failed the world's poorest. No matter how hard they work, neither they nor their children can aspire to live as

people do in the West. Peak oil, climate change, patenting of life forms, extinctions, land degradation, toxics – the poor know that 'We are too late to live like you do.' We are missing something of fundamental importance if we think that the issues of terrorism and ecology are separate. Pugwash could make a huge contribution by drawing attention to their systematic interrelatedness.

International Student/Young Pugwash (ISYP) has committed itself to raise awareness and stimulate debate among ISYP members about the socio-economic, environmental, political, and policy determinants of complex political emergencies. I would say, 'Right on!' My only suggestion is to try to extend your awareness raising activities beyond ISYP members.

Notes

1. See Georg Frerks, New security challenges: broadening the Pugwash agenda? ISYP Journal on Science and World Affairs 2 (2) (2006) 51-58 (this issue).

2. Workshop Announcement 'New Challenges to Human Security: Empowering Alternative Discourses – A Pugwash Study Group initiated by Pugwash Netherlands and International Student/ Young Pugwash (ISYP)', published on 24 March 2006. (http://www.pugwash.nl/Documents/ New_Challenges_Workshop.pdf).

3. Our Task is an international non-profit network of individuals and organisations. 'Our' is everyone; all are invited and responsible. 'Task' is a mutually enhancing relationship between humans and Earth. The program of Our Task assumes that (i) a number of large institutions or establishments – what we call 'culture-shaping' institutions – guide and shape the evolution of human culture; (ii) a number of small organisations – what we call 'change agents' – are assisting the culture-shaping institutions to recognise and accomplish constructive cultural change; and (iii) a thoughtful contribution to a vision for the future of Earth could be provided by our students – the next generation – if they were encouraged and supported in the effort. For more information about the activities of the network, see http://www.ourtask.org.

4. P. M. Vitousek et. al., Human domination of Earth's ecosystems, Science 277 (25 July 1997) p. 495.

5. While we have the Breton Woods international institutions, they are based on and defend the concept of national sovereignty.

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Conflict research: lancunas, mantras and pitfalls

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The invitation to give a presentation at the Young Pugwash (ISYP) workshop on New Challenges to Human Security in Wageningen, the Netherlands and contribute this comment came at the right time. With the academic year drawing to a close, and the number of MA theses of a new generation of conflict researchers piling up on my desk, the ISYP request allowed me to pause for a moment and look critically at my field of study. 'What are the lacunas in conflict research?' the ISYP organisation wanted to know. 'Where do our analyses or approaches fail? And: do we ask the right questions?' The art of formulating questions lies at the heart of academic thinking and, interestingly, prompting and important questions such as these are often asked by people outside of ones own area of expertise. In this brief article I will focus on the first two questions and discuss a number of lacunas, mantras and pitfalls in the new field of study that Conflict Studies is by means of six brief statements and recommendations (see the headers of the following sections). Hopefully, this will inspire people to 'ask the right questions' when it comes to understanding how and why people resort to collective violence.

The interpretation of violence is political

Over the past decades, mainstream views on violent conflict in the media and countless UN and World Bank reports, consultancy documents, and NGO briefings have shifted substantially. During the Cold War, local conflicts were mostly seen as 'proxy wars' and explained in terms of ideological divides (communism/capitalism) and super power strategy, at times combined with political turmoil connected to processes of post-independence state-building. After the Cold War, the violent conflicts in the Balkans, Indonesia, and Africa were coded as 'ethnic' or 'ethnonationalist': ancient hatreds and primordialist identities were seen as root causes. Since the late 1990s, increasingly conflicts are framed as driven by greed, 'terror', criminality and warlordism.

Not surprisingly, this shift in mainstream conflict analysis coincided with a paradigm shift in the international arena. The 'ancient hatred' view matched the principle of non-interference, which prevailed during the early 1990s: exemplified by the reluctance of the international community to intervene in wars in, for instance, the former-Yugoslavia and Rwanda.

Particularly after 9/11, criminality became the dominant policy framework through which local wars were understood and dealt with. Increasingly, organised violence in Congo, Angola, Liberia, Somalia, Sierra Leone, Colombia, Chechnya and Afghanistan was depicted as illegitimate, abusive, reigned by terror and potentially threatening regional and global security. This new understanding of local war established both a justification and legitimation for intervention, in line with the Bush doctrine and the War on Terror.

The interpretation of violence is political. The selection of a form and level of explanation for contemporary violent conflict is a serious political act in the sense that representations have political implications. The way in which violent incidents and conflicts are coded and categorised will play – intentionally, or not – a role in casting blame and responsibility [1]. Since the interpretation and representation of conflict and violence can have enormous consequences (from 'letting them fight it out amongst themselves' attitudes of the early 1990s to the 'military humanism' or 'will to govern' of today) there is a great need to critically examine the social phenomena of contemporary violent conflict, its interpretations and their consequences.

Identity is crucial, but should be handled with caution

Despite the great variety of views on contemporary conflict most authors acknowledge the key role of the identity group (however problematic). Azar [2] was one of the first in the field who argued for a radical revision of Clausewitzean ideas by claiming that it was the identity group – ethnic, religious, cultural and other – and not the nation-state that was at the core of most contemporary conflicts. Although today the 'extra-state' wars conducted by the US in Afghanistan and Iraq attract the lion's share of media attention, Azar's claim is still supported by evidence: in the 1989-2004 period 94 per cent of worldwide violent conflicts were intra-state wars [3,4]. This is *not* to say that 'identity' or 'identity differences' are causing violent conflict. Although this idea is frequently unknowingly used in the media, among academics the 'ancient hatred' view is generally rejected, and primordialism is mentioned only when scholars want to point out what they are not. Instead, *identity boundary drawing* is seen as a central aspect of the mobilisation of support for armed conflict in the world today. Still, identity labels should be handled with caution: actors in civil war cannot be treated as if they were unitary. The problem with 'identity' is that although semantically 'identity' implies *sameness across time or persons*, most (constructivist) analysts continue to speak of 'identity' while at the same time repudiating this implication of 'sameness' [5]. This problem also arises in the study of intra-state war: the concept of 'identity group conflict' or group violence entails the total inter-changeability of individuals, both as participants and perpetrators and as targets. However, as Kalyvas [6] points out, civil wars are not binary conflicts, but complex and ambiguous processes that foster interaction among actors with distinct identities and interests. 'It is the convergence of local motives and supralocal imperatives that endow civil war with its particular character and leads to joint violence that straddles the divide between the political and the private, the collective and the individual' [7]. The study of contemporary conflict should therefore consist of a systematic analysis of group dynamics, interests and alliances at various levels: including local and national actors, insiders and outsiders, individuals and organisations, civilians and armies.

The field of Conflict Studies is inventing the wheel

Parallel to the increase in civil wars (since the 1950s) the desire to understand, prevent and contain these conflicts resulted in a boom in research and training institutes on Conflict Studies, Conflict Resolution, Peace and Conflict, and Human Security, often closely tied to policy debates. However, this new field – understandably – has its weaknesses. Much older academic traditions often accuse the field (and in particular studies of ethnic conflict) of 'inventing the wheel': e.g. Ignatieff [8] turning to Freud to explain why 'neighbors kill', over-looking the work of Social Identity theorists who study the process of identity group competi-tion; and the intellectual wall between the study of ethnic conflict and long traditions of scholarly theorising about group mobilisation and collective violence. Clearly, Conflict research can greatly benefit from drawing on these established scholarly traditions.

Multidisciplinarity is not obvious

'Young' as it may be, Conflict Studies has its own set of mantras. The two most prominent mantras in the field are the repeated stress on 'conflict is complex', and the 'need to be multidisciplinary'. A combination of these two mantras ('multidisciplinarity is complex') may do the field some good, since multidisciplinarity is too often taken for granted. The various approaches to conflict and violence that the field of Conflict Studies seeks to combine under the heading of 'multidisciplinarity' are not simply heterogeneous, but in fact often point in (sharply) differing directions. To be sure, there are affinities between certain of them, but there are strong tensions as well. The study of conflict bears a multivalent, and at times even contradictory theoretical burden.

As conflict researchers we need not only to be aware of the different theoretical approaches to conflict, but also pay (more) attention to their underlying assumptions, their affinities and contradictions. I argue that there is no such thing as a 'grand theory of violent conflict', and see no use in seeking to come to a coherent integrated synthesis of the approach-es available. Rather, we need to be more explicit in the way we position the various relevant theoretical views vis-à-vis each other and within a broader frame. This will allow students of conflict to do their bricolage, but in a well-informed, and knowledgeable way.

Conflict = clustered violent episodes

Too often conflict and violence are lumped together as one and the same thing. We need to take a closer look. Under the heading of 'the Sri Lanka conflict', 'the Colombia conflict', 'the war in Bosnia', 'Rwanda', or basically any other 'intrastate war', many different forms of violent incidents take place. If, for instance, the media talk about the Sri Lanka conflict flaring up again, what we see on the ground are various, at times unrelated violent incidents: in-fighting between competing factions within the Tamil Tigers in the East, villagers killed by land-mines in the North, violent incidents in the South between Muslims and Tamils militias, and yes, 'conventional warfare' between the Government of Sri Lanka's (GoSL) army and the Liberation Tigers of Tamil Eelam (LTTE) cadres.

What in fact often happens is that violent episodes are clustered, are lumped together and called a conflict. Consequently, all violence that occurs is placed under the heading of the master narrative, the master cleavage. Often the great variety of violent incidents and episodes

are perceived as mere (and rather irrelevant) local manifestations of the central conflict cleavage (GoSL versus LTTE, Hutu vs. Tutsi, Armed Revolutionary Forces of Colombia, FARC, vs. Colombian army or paramilitaries, etc.). They are seen as automatic and unproblematic after effects of actions and decisions located at the centre. However, ethnographies of collective violence during civil wars show a much more complex picture. Violence in an ethnic or class war may not be ethnic or class violence. Very often under the heading of the master narrative many different forms of violent acts occur: private, criminal, sexual violence, the settling of old scores, land conflicts, family feuds etc. Most macro studies of conflict disregard the private content of political violence and miscode individual cases. This calls for fine-grained analysis that takes into account the different forms of violence. It is the interaction between local and central, private and political spheres that counts, and helps us to understand the dynamics of intra-state war.

Analysis matters

Our 'readings' of a conflict will for a large extent determine what sorts of intervention we design. Too often lack of analytical tools and lack of grounded critical analysis of collective violence and conflict results in ad hoc policy making, and misreading. As researchers we have to be highly aware of the political landscape in which we operate and of the political implications of our representations. The task of conflict analysis is to unravel the complex dynamics of interactive processes in order to understand how and why people resort to violence. Conflict policy should be based on solid, critical, and grounded analysis. This is an important field of study. There is a lot to be learned. Analysis matters, for there is a lot at stake.

Notes

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6. Stathis N. Kalyvas, The ontology of 'political violence': Action and identity in civil wars, Perspectives on Politics 1 (2003) 475-494.

7. See [6, p. 487].

8. Michael Ignatieff, The Narcissism of Minor Difference, London, 1999, pp. 34-71.

Contents of the ISYP Yearbook 2005

Articles

Comment

Brief