

ARMS RACE, CONFLICT AND THE SCIENTIFIC METHOD<sup>(\*)</sup>.

A COMMENT

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I must say I am quite impressed with this symposium. Although by training and profession I am in the so called exact sciences my involvement in the past with the problem of nuclear weapons was more as a peace lover than as a scientist. This meeting made me realize what, I think, is the correct application of science to this problem.

Of course science is applied time and again to partial aspects of the war problem. Physics is used to compute radiation yields, statistics to estimate casualties and the number of "lucky" survivors, biology to find the radiation damage to the cells, etc. However a partial application of science and quantification to a problem of global human dimension may only create an illusion of seriousness and precision and in the end do more harm than good. For example, I am sure that it was in a truly "inquiring scientific mood" that the Jason committee once discussed the effectiveness of ear cutting to the Vietnamese

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prisoners of war...

Therefore, if science is to be useful in this problem, what one should do is to apply the scientific method not to partial aspects, but to the problem as a whole. I believe this is what, all along, was in the mind of the organizers of the symposium. To make a global assesement and a global application of the scientific method.

It is my impression that even here, among specialists of the problem, some of the methodology of exact sciences is needed. For example, I was amazed to hear some of the statements about the arms race, deterrence and the hope that somehow a mutual balanced arms reduction will work. Any student of mathematics, familiar with the mechanics of the arms race, will tell you that it looks like a well known situation in game theory called the prisoners' dilemma. This is a problem that has a solution favourable to both players and a second solution that although not disastrous is rather mediocre. The catch is that the good solution is the risky one and the safe solution is the mediocre one. Even if the players agree at a certain point to cooperate and choose simultaneously the good solution the situation is unstable because there is the risk that one of them will later change his mind and bring about an heavy loss for the other.

As long as there is fear and distrust between two military powers the arms race is a prisoners' dilemma. Therefore the attempts to embark in mutual arms reduction are just attempts to stabilize as solution that is, by

nature, unstable. I was sympathetic with Dr. Schauer when he said that unfortunately such negotiations are not going very far. It is not their fault, though. It is only that the whole idea is faulty mathematics.

(Nevertheless, while there is no better alternative one should keep trying. An adequate information flow between the players may, by reducing distrust, bring about some cooperation and the unstable solution can hold, for a while at least.)

Returning to our mathematics student if he is really eager to help, he may also tell you that even the stable mediocre solution may become unstable when there are more than two players in the game. As Prof. Zimmerman said, the technology for nuclear weapons (and let us not forget for other weapons of massive destruction) is now widely available throughout the world. How can one be confident that even the arms race and deterrence between the superpowers will remain stable with so many players entering the game? How can one base one's hopes for real peace in such flimsy mathematics?

It is often stated, as the great peace-keeping achievement of nuclear weapons, that of the more than one hundred armed conflicts fought since 1945 none has been between two nuclear nations. The way of thinking in international politics must really be very special. In any other science that statement would be the very indictment of nuclear weapons as a means to keep peace. How come such a "wonderful" peace-keeping device was unable to avoid the hundred conflicts that are used to praise it?

It is significant that statements concerning the deterrent peace keeping virtues of the nuclear weapons always originate from someone in the nuclear powers. Of course, what nuclear weapons have secured so far is a relative immunity for the nuclear powers to engage weaker nations and do as they please in their spheres of influence without fear of intervention by the other powers. To label this as peace keeping requires a very twisted notion of peace.

And if nuclear weapons insure that there will be peace, at least between those that possess them, does it mean that final peace will be achieved when everyone has a couple of atomic bombs in his backyard?

It should be clear that so self contradictory a concept as nuclear deterrence cannot be a stable solution to world peace. Should one become desperate? Not yet. Follow the main lesson of this symposium. Be global, look at other aspects of the problem. If the hardware aspect cannot help perhaps one should approach the problem from the moral and psychological point of view.

The visions of bureaucratic mass murder, and emotionless pushing of buttons are moral and psychologically very impressive indeed. Can we however derive from them a solution to our problem? Perhaps. Perhaps we have become so engrossed with technology that we have lost all sense of human values. We need perhaps a new morality, a new religion.

It is a beautiful theory. But what does the scientific method say here? It says that if you have a theory you

compare it with the data and try to prove or disprove it. A theory is only an instrument to cope with reality, it is not a slogan. Now, if one opens the history book and reads about the times when religion had a hold on people and professed (in theory, at least) high human values, what does one see? Wars, many wars, even mass murders committed in the name of religion. Remember the crusades.

Too bad, perhaps our theory does not provide the answer after all. Throughout all historical times humans have often resorted to war to settle their conflicts. The reason they survived until now is not because of religion or of higher human values; it is because their means of extermination were somewhat limited.

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The conflict that we now fear so much, is just another conflict rooted in the same human nature that already existed before high technology, computers and push-button missiles. The difference now is that this conflict, because of the nature of the weapons, risks extermination of mankind, or of human civilization at the very least.

Therefore what seems to be needed is a different way to control conflict, the same kind of human conflict that in the past was regulated by war. Strange as it may seem there exists already at least one such method that is both time proved and people-proved.

— Why do you not kill your neighbour when you are mad with him?

— Because there is a law that forbids killing.

- What happens if you break this law?
- You go to prison.
- Who takes you to prison?
- The police
- Why do you accept the law and the police?
- Because they are both elements of the global society (your country) with which you identify yourself.

Is it not the danger of a nuclear war a global world problem? For a global problem, a global solution: A world law and a world force to regulate conflict.

I know, I know. Such a proposal raises always many questions: Do countries loose their identities? Will countries fight for preponderance in the world enforcing power?, etc.,etc.

The main question of course is the most difficult one. How does one convince the sovereign countries to loose their cherished war-waging sovereignty? (Even if they know that such sovereignty will eventually kill them).

I agree it is a difficult question. But let me come back to the scientific method that is the main theme of this comment and describe how this method is applied to a technological project. Suppose one wants to construct a gadget for some "sophisticated" purpose. (an H-bomb for example!)

- First step: the problem is formulated.
- Second step: you formulate an appropriate theory and an implementation project.

- Third step: you construct a prototype and develop it until it is operational.

Appropriately the last step is called "development". So when one says that a world law and a world enforcing power is a very difficult project that does not mean that the theory is wrong, it means that the "development" stage may be very difficult. So it was for the H-bomb. But if we could use this scientific method to construct an H-bomb, why can we not use it to construct peace?

There are plenty of proposals and plans for peace. You may find some of them more appealing than others but all share the same basic flaw: nobody seems to be able to put them into operation. Science and technology, if not responsible for the existence of the war phenomenon, were nevertheless extremely successful in raising the destructive power to extraordinary levels. As the people in my country says: "a dog's bite is healed by the fur of the same animal". Why not use the same scientific-technological approach, that led us into this fix, to get us out?

The analogy is clear. Nobody in a factory would try to build the simplest new device using uncoordinated efforts and without a blueprint. Why should one think that such a delicate implement as peace could be built in such a way? As in a technological project one needs a company, a designing team, and a good staff of specialized workers. The "company" could be an institution with some standing in the peace issue or an international organization. The designing team of "peace engineers" should assemble people with diverse

backgrounds and professional expertises. Their job would be to draw a "blueprint for peace" with an execution time-table and clear implementation strategies.

This blueprint would then be widely publicized. What would happen if all peace workers around the world instead of spending their time protesting against war were all at the same time demanding the same solution?

When I speak of peace workers I do not mean peace movement activists alone. Politicians, even military men in the nuclear planning groups of NATO and the Pact, I doubt they are the war mongers that some would like us to believe they are. Many of them, perhaps even the majority, may be sincerely convinced that they are making their best to preserve peace. The catch is that, by relying on balance of power and deterrence, they base their efforts in a very shaky mathematical theory.

When drawing the blueprint for peace one should not mix goal achievement efficiency with ideological utopia. For example a solution of the type "world law and world enforcing power" should not be confused with world government and united world. The minimal solution to achieve the goal (that is to avoid war) requires no such utopian schemes. The countries could very well keep their political and economic autonomies and even small non-nuclear armed forces to reassure their insecurity hang-ups, to serve as recruiting ground for the world army and also perhaps to make unlikely any attempt at global dictatorship through the power of the world army. The only severe limitation on their national



sovereignty would be the capacity to wage war as a means to settle a conflict. After World War II however, such a limitation is not new, the transnational army organizations that now exist essentially implying a limitation of this kind inside each alliance.

Resistance to the idea of a world enforcing power would perhaps be smaller among the military than among the arms industry. Military men value ideas of bravery and honour. Such ideas come into jeopardy when one imagines one's role as a participant in the genocide of millions of unarmed civilians, and the massive destruction of culture and civilization. The military ethic is much more compatible with a global peace keeping role.

There may be other solutions to regulate human conflict at a world level. Perhaps. But be careful, check them against logical consistency, stability and known data as the scientific method requires, lest they be mathematical illusions or wishful thinking.

Any long term solution for stable peace in the world needs time, perhaps a long time to implement. Meanwhile all indications are that time is running short, very short. The solution seems to be to buy time. Here the most efficient way is perhaps the concept of "crisis management" mentioned by Col. Glatt. The multinational permanent working group, formed by members from NATO, the Warsaw Pact, the other nuclear powers and also from some non nuclear nations, that he mentioned, might indeed be of value in averting over-reaction in time of crisis.

Nuclear war triggering by accident, irrational behaviour, terrorism and local conflict escalation has been discussed many times. A less discussed possibility is what I will call the induced confrontation syndrome. A.M.Katz recently wrote that in the event of nuclear war the likely "winner" could only be some regional power in the less industrialized nations. Aware of this possibility some megalomane third world leader with imperial designs might attempt to provoke the superpowers into a nuclear conflict. He might even base his behaviour in the rationale that he was reversing history and putting an halt to the exploitation of the third world by the industrial nations. Or making them pay for their apathy towards the simple technological problems of poor nations and their eagerness to develop high technology murderous toys.

At first sight all symptoms would look like those of a Balkan trigger, but with the difference that the local conflict would not be the real issue. The local war being initiated not to settle a local dispute but to provoke the confrontation of the nuclear powers. This could happen in a region where the hegemony of the big powers is still undecided (Africa, for example). If some local nation or group of nations with adequate military means were to launch what looks like a war of conquest throughout the whole continent, it might be hard for the northern powers to decide which action would be in their best interest.

A "crisis management" permanent group equipped with the means and expertise to predict a great many plausible

scenarios could avert catastrophic overreactions. At the same time continuing operation of this group could, through the exchange of information, create a certain amount of trust between the nations.

However one should not be overconfident, nor become addict to the crisis management medicine. No amount of crisis management can forever stabilize a basically unstable situation. A long term stable solution is the goal and, as such, should be pursued relentlessly.