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THE LOGIC OF NUCLEAR ARMAMENTS

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Introduction

It has always seemed to me that the possession of nuclear armaments is quite irrational, or, not to put too fine a point on it, crazy. Their capacity to destroy life on earth is clear; and whilst we are in possession of them, there is an increasing chance that this will happen. It has therefore always puzzled me when people who are apparently sane stand up for them. The reasons one is typically offered have an air of paradox about them. For example, it is often said that nuclear weapons are necessary to prevent war. This is strange, since weapons are precisely the instruments of war. However, paradox aside, the argument is not entirely senseless. How, then, is it possible to offer rational reasons for something so irrational? In what follows I will analyse this situation. The conclusion is, perhaps, somewhat surprising. (At least, it surprised me.) And it is likely to be popular with neither side of the disarmament debate. However, understanding the situation is a necessary condition for appropriate action.

There is little of novelty in the paper apart from its conclusion, and some may be irked by my explaining things that are well known (to some). I would ask their indulgence, but do not apologise. It seems to me that on the issue of nuclear armaments, above all issues, philosophers have a duty to write in a way as to be intelligible to non-philosophers.

The Irrationality of Nuclear Weapons

Let us start with the irrationality of possessing nuclear weapons. The argument is quite simple. So that it is clear, let me give, first, a more commonplace similar example. Suppose you are going out, and you have to decide whether or not to take an umbrella. It's not very likely to rain and it is inconvenient to have the umbrella. But not to have it if it rains is very unpleasant. The method of deciding the rational thing to do according to decision theory (the mathematical

theory of decision-taking under uncertain conditions) is as follows. First, we assign *utilities,* that is, values, and probabilities to the various outcomes. We might tabulate these as follows.[1]

	Rain	Not rain
1. Take umbrella	-5 \ 0.1	5 \ 0.9
2. Do not take umbrella	-20 \ 0.1	10 \ 0.9

The figures to the right of the slash indicate the probabilities of the events. Notice that these do not change from one row to the next, since the probability of rain does not depend on my taking an umbrella. The figures to the left of the slash represent the utilities of the various outcomes. Their absolute magnitudes are arbitrary: it is only their relative values that are important. (0 is taken, conventionally, to be the value marking indifference.) Thus, no rain and no umbrella is the best outcome, followed by no rain with umbrella, followed by rain with the umbrella, and last of all, rain and no umbrella. We now calculate the *expectation* of each course of action, that is, the sum of the appropriate probabilities times utilities. Thus:

Expectation of course 1: -5x0.1 + 5x0.9 = 4.0
Expectation of course 2: -20x0.1 + 10x0.9 = 7.0

And we take that course of action which has the highest expectation. In this case, we leave the umbrella at home.

Let us now apply the same method to the question of the possession of nuclear armaments by the U.S.A. and the U.S.S.R. We might draw up the following table :

	No war	Limited war	Unlimited war
1. Armaments	50 \ 0.5	-100 \ 0.4	-00 \ 0.1
2. No armaments	100 \ 0.1	-50 \ 0.6	-100 \ 0.3

To a certain extent the figures are conjectural or arbitrary. However, they reflect the following intuitions: The most preferred state is no war, and it's better to have it without armaments since the money spent on armaments could be spent on better things. Limited war is preferred to unlimited war. In this case the probabilities of the various outcomes are not independent of the actions. Thus, armaments increase the chance of peace and decrease the chance of unlimited war. These facts could, I suspect, be contested. However, this is not important. The important figure is the utility of unlimited war with

nuclear weapons. The results of such a war would be the destruction of all life on the planet, for reasons that are well known. Its utility has therefore to be, not only less than all the others, but indefinitely so. Hence the value -00. (Some enormously large negative number would do too.) Now when we perform the calculation of expectations, that of the second course will be a certain number, and that of the first will be -00, somewhat less. And this will be true *however* we assign probabilities, and even utilities, provided only that they are *something* similar to those given.

The case is conclusive. It is indefinitely better not to have nuclear armaments; and given that it is irrational not to do what is best, it is quite irrational to have nuclear armaments.

The Reason for Nuclear Weapons

So much for the reasons against having nuclear weapons. Let us now turn to the other side of the coin. The above argument was carried out from a god's eye view, or if you don't like god, from the collective viewpoint of humanity. It abstracts from the fact that the collective is composed of individual groups who are in a state of conflict. Once we take this into account some different arguments present themselves. Again, I will explain these by way of a (well known) example called the prisoner's dilemma.[2]

Suppose that I am a detective and have caught a pair of suspects who, I think, have committed a crime together. If neither of them confesses I can convict them of at most a minor offense. What I need is a confession. To this end I separate the prisoners and tell each of them the same thing: if neither of them confesses then they will both receive 2 years. If they both confess then they will both receive 5 years. However, if one of them confesses and the other does not then the one who confesses will get off free and the other will get 8 years. We might summarise the options in the following table. The figures to the left of the slash are B's punishment and those to the right are A's. The -'s are there to indicate that it is punishments that are at issue.

	A confesses	A does not confess
B confesses	-5 \ -5	0 \ -8
B does not confess	-8 \ 0	-2 \ -2

I then go away confident in the knowledge that I will get my confessions, provided only that the prisoners have time to think about it. Why? B reasons as follows: Either A will confess or he will not.

Suppose, first of all, that he does (first column). Then I am better off if I confess (five years as opposed to eight). Suppose, on the other hand, that he does not (second column), then again, I am better off if I confess (no years as opposed to two). Hence in either case, I am better off if I confess. Therefore I should confess. A, of course, reasons in exactly the same way. He too, therefore, confesses. The result is that both A and B confess, and both go down for 5 years. This is clearly not the optimum outcome for the prisoners, which is for neither of them to confess. In fact, if we measure the outcomes by man-years in prison, this is the *worst* outcome. Yet there seems nothing wrong with each individual's reasoning. I will return to this in a second, but first, what has this to do with nuclear armaments?

The answer should be fairly obvious. For A take the U.S.A.; for B take the U.S.S.R.; change 'confesses' to 'has nuclear weapons' and the situation is exactly the same. Thus, B reasons: either A has nuclear arms or it does not. If it has nuclear weapons I am better off if I do. (There is a strategic stalemate instead of my being at A's mercy.) If it does not have nuclear weapons, then I am still better off. (I can get my own way instead of there being a stalemate.) Hence in either case I ought not disarm. A of course reasons similarly, and the result? The worst possible case. Both sides possess nuclear weapons, which, we have already seen, is the irrational state of affairs.

The first time one sees the prisoners' dilemma it is easy to underestimate the force of it. The obvious thought is that the two parties, A and B, be they prisoners or super-powers should trust each other. Isn't it obvious that the best state is that where both disarm/do not confess? And isn't it obvious that it must be obvious to the other party too? If only each side would trust the other then this could be achieved. However, trust has *nothing* to do with it. When B reasoned, the fact that he could or could not trust A did not come into it. He reasoned that *however* A behaved he would be better off. As long as each party reasons in such a way as to maximise its own interests the unfortunate consequence arises.

Another point at which one might jib at the argument is this. It is crucial that B will be better off confessing/having armaments *whatever* A does. In the prisoners' case we have fixed the sentences so that this is obvious. With the armaments case, things are a bit different. Since this is not an hypothetical example we are not free to fix the utilities at will, and one might well doubt that I have got them right. It seems fairly clear that if the other side has no nuclear armaments we are better off with them. We are certainly not going to attack ourselves, and while we have them, we can prevent other

nations from interfering in our affairs to our detriment. (And if the other side has none, we will not even have to spend much money maintaining a nuclear capability)

But are we better off having the weapons if the other side has them? *Prima facie,* the answer is 'yes'. As long as the other side has the weapons, we are liable to nuclear attack and the other side is less likely to use them if it knows it will get them back. Against this, it could be argued that in fact we are *more* likely to suffer nuclear attack if we have nuclear weapons ourselves, just because the other side will be anxious to get in first. Each of these arguments has force, and I see no way of determining which is stronger. Let us therefore call them stale-mated.

There is, however, another reason why we are better off with nuclear armaments if the other side has them. This concerns not the undesirability of suffering nuclear attack, but the desirability of national autonomy. The reason is this: given that the parties are in a position where their national interests collide, which will always occur as long as they are separate nations, a side with nuclear weapons will always be able to enforce its national interests on the side without. Thus, even if the side without never gets attacked it will lose whatever national autonomy it has. Hence, as long as the parties act purely on the grounds of national interest, they are better off with nuclear weapons if the other side has them. This table entry and the dilemma, therefore, stand.

Contradictions

We see that with respect to nuclear armaments the situation is such that the pursuit of national interests by parties with conflicting interests causes a situation that is collectively the worst for everyone. This may be disconcerting, but it is not an unknown sort of situation. Theoretically, it is well recognised.[3] It is just (one of) the things that Hegel and Marx call a contradiction: a situation where the pursuit of a goal logically requires the employment of methods which ultimately have precisely the opposite effect. Perhaps Hegel's most famous illustration of this is the master/slave relation.[4] (Subsequently made much of by Sartre.[5]) To build his self-esteem a person, A, requires the recognition of another, B. The obvious way is to enslave B so that he must behave as A says. However, by doing this A makes B a slave, whose recognition counts for nothing. The end is therefore self defeating.

Perhaps a little closer to home is one of the fundamental

contradictions that Marx diagnoses in capitalism.[6] Essentially, the details are these: the amount of profit that can be made in (capitalist) society on a certain kind of item is essentially related to the amount of labour that, on average, is employed in producing it. Now as technology develops, machines are produced which are cheaper to run than people. An individual capitalist reasons as follows: if I use machines and get rid of people, my products will have a smaller cost-price than before and my individual profit will therefore be greater. Of course, all individual capitalists reason this way. Indeed, they have no choice: if they do not mechanise, their prices will be under-cut by competitors who do and they will go out of business. Hence over all, the average amount of labour that goes into the production of an item will drop, and the average profit on the item will therefore fall, which is just what the capitalists, as a class, do not want. The pursuit by individuals of a goal by totally appropriate methods results in the collective abnegation of that goal.

This second example, it seems to me, is particularly similar to the armaments case, and if this is right, there is an important lesson to be learnt here. I have argued that the abolition of nuclear weapons, whilst rationally obligatory, is not possible whilst there are nations which act, fundamentally, in their own interests. But if nations did not act in their own interests (nationalism) they would not be nations. (Just rather large benevolent societies.) Similarly, as Marx observed, if capitalists did not act in the interest of their capital (the pun is intended), they would not be capitalists. And just as to get rid of capitalism one must get rid of capitalists (I speak of the role, not the individuals), so, to get rid of nationalism, we must get rid of nations; and this means, in practical terms, getting rid of all national governments; for these are the bodies whose political role (whatever the intentions of the individuals comprising them), is the maintenance of national interest.

The ultimate conclusion of this discussion will now depend on what one thinks of the possibility of abolishing national governments. Pessimists will conclude that we are stuck in the nadir of history: humanity at its collectively most stupid, waiting only for an accident, such as a flight of birds on a radar screen, to terminate the human, and every other, race. I am more optimistic. An end to nationalism is possible, though not without a fundamental global economic reorganisation. Neither do I expect national governments to abolish themselves, any more than I expect capitalists to. The change must be a popular one. But what could be more popular than the preservation of all life?

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Footnotes

1. For a clear account of this, see Richard Jeffrey's *Logic of Decision,* McGraw Hill, 1965, esp. ch. 1.
2. See, e.g., Jeffrey *op cit,* section 1.4.
3. See, e.g., Jon Elster's *Logic and Society,* John Wiley, 1978, esp. the section entitled 'Suboptimality' in ch. 5.
4. For a readable account of this see Charles Taylor's *Hegel,* Cambridge U.P., 1975, pp. 153-7.
5. See, e.g., J-P. Sartre *L'Etre et le Neant,* Gallimard, 1943, p. 434.
6. See *Capital* Vol. I, ch. 15, section 3b; pp. 526-32 of the Penguin edition 1976.