

## PROBLEMS OF ARMS CONTROL AND DISARMAMENT (138A)

Lecture XX (Lederberg): "Emergent issues in arms control:  
Chemical and biological weapons: II"

One of you at the end of my last lecture asked me how I felt about discussing such a morbid subject. I was a little puzzled that that question should arise at this stage of an arms control course so I thought I'd better try to answer it

some of these established by law and the safety codes and the labeling requirements, and safety regulations as imperfect as they are for appliances and for electric power cords and house wiring and so on, and even more by common sense since most of us do not have any great desire to electrocute ourselves we generally do not stick our fingers into the electric power outlets if we're more than 3 years old. In order to establish these safety rules for the use of this very powerful instrument which has an enormous capacity for human suffering we have to understand the technicalities of electric power, we have to know just what is safe and what is not safe to handle, what thickness of insulation has to be put around a wire, how to produce switches that will properly control it and so on. This is very self evident. And we also have to understand the politics and the economics of the situation which perhaps we do not do as well as we should since there are a thousand electrocutions a year to the present time, and it would be a rather cause effective safety measure that would reduce that number down to a couple of hundred. The last few hundred would be very very hard to eliminate and still have electric power in our environment at all. You may not have realized that patients are sometimes electrocuted in a hospital. There are half a dozen cases a year of accidents of this kind which are the result of not understanding how much it costs not to undertake certain kinds of safety precautions. I may seem to be departing from the major theme, but the same kind of considerations apply to armaments and to arms control, that in order to know what it takes in order to control the use of a particular device we must understand its technicalities. We have to have even some understanding of how many milligrams of a nerve gas are required in order to kill a man and what the relationships are of the chemical industry that might be producing such a substance as compared to many other substances. And even more than that we have to understand the politics and the economics of the use of a particular form of arms. And I can't deny that there's a certain loss of innocence in dealing with the devil on matters of this kind. This is inevitable, and in fact anyone who has had to do an autopsy in order to learn how someone has died and might prevent a recurrence of this particular disease lost his innocence long since in any confrontation with death. I don't know how we can make a better world without giving up some of our innocence in dealing with the issues that make it less than the world that we would like it to be. I don't think that chemical weaponry per se is an especially morbid subject. I think it is a part of the background of, as I said before, the most morbid of all. I think the extent to which we can confine it within its technicalities we have some hope of dealing with it and it may end up being a more vital subject on the basis of our knowledge if we can apply it properly to limit its uses.

Some people think of arrangements like the Geneva Protocol as if they were the Ten Commandments and they discuss their textual exegeses of the Geneva Protocol and this will have a great deal to do with the subject matter of today's lecture on the non-lethal agents as if these were commandments from on high that must be interpreted in the light of some kind of divine inspiration. I fear we're going to need that sort of divine inspiration if we try to interpret the text of the 1925 contract between a limited number of powers which did not then include the United States to determine whether or not it does or does not, or should or should not, include the use of non-lethal, harrassing agents like tear gas on the one hand, or anti-plant agents like herbicides on the other. But first of all I want to make very clear that there are two very very different questions. One is the legal one about the interpretation of a contract made in an era before the discovery of new technicalities, and the other is what would be the most appropriate policy for this government to undertake in the use of these agents.

The latter is especially difficult because we might well say the most appropriate policy is that we should not be involved in war at all and in that case the question of the use of herbicides or tear gas is almost an irrelevancy that becomes a small part of a very much larger issue which is indeed my own position on this question. But in the very natural frenzy to find every possible outlet for a protest against the war, for indicating each of the various ways in which it harms our own interests as well as demeans our public and self image of a humanitarian society, of course one cannot avoid the particular kind of harm that the use of these agents has done against the backdrop of the very much larger injuries that higher explosives and the conventional methods of military activities have implied there.

But I think if we are going to take a rational examination of what the structure of world order should be insofar as we focus on the instruments like chemical warfare rather than on the existence or nonexistence of hostile activities it is a much deeper and basically a much more important question that we ought to analyze in a little more detail just why we want to focus on a particular class of weaponry and just what kinds of contracts and agreements we should seek to have developed as a means of consolidating not only our own policies but that of other nations as well. It's putting the cart before the horse and discovering the chicken before the egg to try to develop American policy about the use of herbicides in Vietnam by an interpretation of the Geneva protocol. American policy is going to be determined by a great many factors including the factors of public opinion in the United States and much more effectively if they are rationally expressed than if they give the ammunition to the hawks for quoting the irrationality of the trashes. Rationally expressed protest on these questions is certainly going to play an important part in the further development of American policy and has already done so. This is not something on which there has been unbending rigidity. There have been limitations on the use of herbicides. There's a rather silly policy that's been announced to allow the usage of the stocks already there but not to provide anymore which is an inexplicable line of policy. There's been less on the question of tear gas but de facto there's been very much less use of tear gas in the kinds of operations now underway than has been the case previously. So that there is an impact in policy. These may, therefore, have less of an effect in contaminating the discussions about the nature of the contractual law that ought to be established in future which poses many more subtle questions in a way. How do you bind other powers to the kind of policy that we might find ourselves able to establish and do not take it for granted that the countries that vehemently denounce the American use of herbicides or tear gas in Vietnam are going to themselves feel bound by those restrictions when they get themselves into some position if they are using military force and find it advantageous to them to make use of these agents. They'll have innumerable excuses for distinguishing the American adventures from the ones that they undertake themselves.

Let us then review the reasons why we then should be considering specific controls on chemical weaponry. The outstanding one is undoubtedly that we don't like to think that we may be the targets of chemical warfare attacks. We would not like to think of a thousand tons of nerve gas being dropped in San Francisco, even in Los Angeles, and what the consequences thereof might be. This could not happen except within the framework of a much larger capacity, that is to say, attack of our own homeland by a capable military opponent and the obvious answer to that question is don't get yourself in the kind of spot where anyone is going to dare to or feel capable of or have the capacity to use any major weapons of this kind, be it chemical weaponry or nuclear weaponry or conventional high explosives or whatever.

Nevertheless, the question of chemical weaponry should not be dissociated from the question of war prevention. There are a number of arguments that can be laid down that the control of these kinds of weapons would contribute to the stability of a world order and that the lack of control and the proliferation and escalation of the use of such weapons can undermine a world order in which peace can be attained and maintained. So that we can turn to a subsidiary argument that if our long-range objective is to not put ourselves in a situation of being the target of a chemical weaponry attack, we might look for ways in which to inhibit the escalation and proliferation of chemical weapons

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in that framework that may be stabilized world order. Let's consider what some of those might be.

The most obvious is the possible development of the technology race above and beyond the rather limited level of chemical weaponry races up to this point which will have direct costs, which will provoke mutual apprehension of the same kind that the missile race has-- it may involve a different set of powers, particularly may involve powers that have not gone into the nuclear game, and that in particular that the development of CW technology and particularly the techniques for the safe handling of chemical weapons which is the major thrust of recent research in CW -- not the development of more lethal agents but how to manage the use of the ones that have been known for the last 20 years -- that the proliferation of this kind of technology may and undoubtedly will lead to its availability to ever less responsible groups and we would then become ever more vulnerable to sabotage, to outbreaks between smaller countries who feel a sudden capability of achieving power not otherwise available through the use of a new and unfamiliar weapon, and so on. It's a bit paradoxical that one of the main contributors to this emphasis on safe handling has been the civic reaction in this country to the accidents in the testing of chemical weaponry of the last couple of years. Two or three years ago there was an unscheduled release of nerve gas at Valley, Utah as a result of which an interesting discovery was made. It was discovered that sheep are remarkably sensitive to nerve gas by a factor of a 100 or 1000 as compared to mammals that had been tested. The reasons for this are not at all clear, but the net outcome was that several thousand sheep were killed by the release of nerve gas from an aircraft involved in testing at the proving grounds at Dugway, Utah. The tanks thought to have been emptied during a low altitude pass in the reservation were in fact not and the gas was released at somewhat higher altitude and somewhat further from the center of the reservation. It then drifted to pasture land, grazing lands, that were used by sheep and after a lot of prevarication and lies and attempts to cover up, the Army eventually paid a bill of several hundred thousand dollars to the owners of the sheep with the implication that, as everybody knows, the testing was responsible for the death of those sheep. I think it has to be said that the Army was then not aware that sheep were so sensitive and they did have reasons for their original questioning that the incident at Dugway could have been responsible for the Valley sheep deaths. This is something that only came out in later investigations that the doses that they had calculated were the maximum that could have diffused out of the reservation could have been capable of doing it.

The scenarios that were then published about the possibilities of this having reached civilian centers I think are incredible but the underlying agenda that there is a great hazard in the handling of these agents and in their testing anywhere within the continental United States that they were not as well monitored as they should be which is a byproduct of the secrecy with which such operations are conducted that makes them not accessible to professional criticism from outside the Army. That underlying agenda is undoubtedly valid and the Army has reacted to it very strongly and has gotten the Public Health Service to monitor its activities. Subsequently the Congress has put this into legislation in the military authorization act last year to require that the Public Health Service be consulted on such open air activity. But even beyond that this has made a significant shift in its program to allow for the safe handling and safe disposal of chemical warfare agents. This may seem like a very good thing if there's to be CW at all, but from the political standpoint it may represent a more dangerous line of development that chemical weaponry could undertake because as these measures become public property, and they inevitably will -- there may be a five-year or ten-year lag between the time that they're held as secrets within the military establishment and the time that they're taught as a subject of a course in chemical-guerrilla warfare, but it will not be a longer lag than that, and it is precisely these kinds of developments that will make it possible for people with relatively unsophisticated equipment to be able to handle chemical weaponry that presents the greatest threat to their further proliferation. Up to now the difficulty in handling these munitions has been a builtin deterrent to any small power or any small group undertaking to deal with them. I do not recommend them to any of you here. You'll very likely kill yourselves and your colleagues if you tamper with such agents,

at their present state of development. Wait 10 years until the Army has released its protocol for how to handle them safely.

We've got to put a stop to that obviously and it would be a very wise thing if this were done even in a reasonably unilateral fashion because there is no doubt that the Administration in any super power faces a rather delicate problem if his concern to deter the other fellow from beating him at this kind of a game. If we stay out of chemical warfare unilaterally we leave a vacuum that the Soviets and other hostile powers are likely to fill very vehemently. If we do into chemical warfare development very vehemently we accomplish exactly the same results because they will feel bound to escalate their response in proportion to what we're doing to be sure that we're not ahead. There is some intermediate level of behavior that represents the optimum for unilateral activity and this could be called a defensive approach, it's one that is entirely justifiable if there is to be any leverage whatsoever towards persuading the rest of the world to come into a multilateral agreement to suspend activities in the field altogether. But until that time has come it would be foolhardy to stay out of it and it would be aggressive and foolhardy to go into it in a very vehement way. I think our present posture in chemical warfare development is still slightly on the aggressive side but not very much so if we're talking about lethal agents. But in particular we ought to deflate the myth that defensive measures are ipso facto beneficial, that there can be no harm in trying to assure the safe handling and safe disposal of these agents because as I say from the point of view of the politics of their actual use this may be the most inflammatory thing that can be done which is something of a paradox.

Before we come to questions of how international agreements can be secured that might relieve all of us of the burden of maintaining even what I would call the defensive level of work on chemical weapons, I think we then must attend specifically to the developments in the non-lethal agents which have so confused the issue. Starting around 1961 both herbicides and tear gas have been used in Vietnam by American military forces. They present rather similar kinds of questions. These are both agents which in any practical meaning of the term are not lethal, they are not asphyxiating gases. They could be regarded as among the other gases or analogous liquids that are mentioned in the Geneva protocol depending on one's interpretation of those terms and the restrictions implied about them. I'm sure that when they were first introduced no one imagined that there would be any serious invocation of the Geneva Protocol as applying to them. Quite apart from the fact that the United States was not a party to the Protocol and was therefore not legally bound by its provisions the notion that their use would be subject to international criticism on the basis of protocol was simply not in mind at the time that these were brought into use and it was only subsequently in connection with the anger directed against American policy in the war altogether that the legitimacy of the use of these agents in connection with the Geneva Protocol was called into question.

I will not attempt the textual exegesis of the history of the Geneva Protocol in relation to these agents. I've been over this literature several times and I can think of no more futile enterprise than trying to create a convincing interpretation that will alter the views of anyone who already has a view on the matter. There are strong arguments presented by strong proponents on both sides. They really boil down basically to the question is it desirable that these agents be used in the present context rather than any meaningful analysis of whether they are or are not within the meaning of the Protocol. International law at this level is primarily on a contractual basis. It is not inscribed in stone on documents from on high and things mean what the parties intend them to mean. If any major party to a treaty finds himself in the situation where he is at odds with other signatories he has the privilege of denouncing it and this confrontation has not been reached at the present time in relation to the Geneva Protocol in a formal way because the United States is not yet an adherent to it. One solution to the problem of the meaning of the Protocol would be to complete its ratification and then determine whether there is a formal exception taken by the other parties to it which they have the right to do. They can claim that if there is an American reservation or implied reservation on the use of these agents that they are not to be included within it that that was not their understanding on the matter

and they do not accept the United States participation in the Protocol as long as there is such a state of exception. This is one of several courses of action that has been opposed. It's the one that comes most nearly to the substance of the nature of international agreements, which is to say that it represents an open quid pro quo -- we will do this if you do that. If that reservation on the Protocol is not acceptable to the other powers they can then say so. If it is acceptable then the reservation will become part of the implied meaning of the Protocol. The reservation that I'm referring to would be a statement, and I'm using it loosely, either formal or informal that the Protocol which will be adhered to by the United States does not include the use of these non-lethal agents or these anti-plant agents. Another position that could be taken, that is the one by the way that I would advocate, is that the Senate ratify the Protocol with the statement that sufficient uncertainty has arisen with respect to the scope of its terms beyond the use of lethal chemicals, that it would be desirable to convene a new conference specifically on this question and submit this for approval -- negotiate further language that is much more explicit about the kind of chemicals that should be included within the meaning of the Protocol and then circulate this for approval or disapproval by the various powers. This would result in the clearest conclusion. One would have a certainty of outcome as to which powers were claiming that they adhered to this and which powers did not. My suspicion is that in these terms if appraised as a new issue rather than as an attempt to make a retrospective indictment of American policies on this matter that it would stand a rather high chance of success. The coercive power of the international community on the United States would certainly, given the domestic contribution to that, be the strongest in that particular framework. That is to say, if there were an agreement to which the majority of the rest of the world powers subscribed that said that from now on it is our belief that herbicides and/or tear gas, assuming that these were negotiated and included in the draft convention, should be prohibited, that if the other powers in the world were to do that I think it would be irresistible for the United States to adhere to that convention with respect to future behavior.

One of the complications in the present situation is that the moral imperative attribution of the Geneva Protocol is used as a kind of indictment of past policy on the part of administration leaders. It isn't just an attempt to influence future policy. It's a way of expressing protest and recrimination about past policy and this may be a good way to vent one's feelings about the matter but it's not politically the most productive thing to do. There are not very many presidents of the United States who are going to subscribe to a policy that might prove to imply that until I changed my mind and I think if we want to have a change in policy rather than maintain such an implied indictment we'll have to take a somewhat different approach and the ones that I was indicating might well be included in that category. The fact is that the president operates under a legacy of past history on this question and this is open to enormous confusion and that unless the function of the demand for change is to blacken his face we ought to find a different way out of it. If it is to blacken his face then we ought to proceed along the present lines.

Suppose we were now to consider new initiatives in chemical warfare control, which is exactly where we stand right now with the current proceedings of the Committee on Disarmament in Geneva which is in recess at the moment. They go on for four or five months a year, as Ambassador Leonard talked to you about. What problems do these agents bring up in the negotiation of further treaties? If we confine ourselves to the language and intentions of the Geneva Protocol, that is to say, to a no first use doctrine, there are difficulties but they are not insuperable. The difficulties would arise in trying to decide exactly what constitutes an armed conflict, exactly what constitutes use in war which is the language of the Geneva Protocol with respect to materials that are in wide civilian use -- herbicides very widely and within a particular use of the term, tear gas also in police use. Every police force in the world uses tear gas and the more the fewer casualties they feel bound to induce because there are always alternative weapons available to the police if they have the job of subduing a riot and controlling a crowd. As unpleasant as the tear gas is, it is certainly the least unpleasant of all the repressive measures that police can use. As we know, the borderline between civil dissent and

armed hostilities is an ever greying one and there is a difficulty that the use of tear gas in a riot situation that might be interpreted on one side as a police action might be interpreted by another side as a violation of the Protocol and therefore an excuse to pull the string on the entire contract. Keep in mind that the force of the Geneva Protocol is a promise not to undertake the use of a chemical weapon first and it in fact includes an implied threat that if there is such a first use that it will legitimize and may be followed up by a counter action. This will be one of the advantages of separating the lethal from the non-lethal agents because I think that if we are going to adhere to the firebreak concept that Schelling has spoken about and I am sure has been discussed with you many times that we try to set up very clear-cut standards probably beyond the lines of what has to be controlled that can be agreed to and that will inhibit all parties from approaching the forbidden area. We want to be sure that the firebreak doesn't work against world order and stability in the opposite way. A firebreak that doesn't hold, a firebreak that is likely to be penetrated by inadvertence or through the extrapolation of long continued activities like the police use of tear gas is a very dangerous one to use because the probability that it will be breached regardless of statements about it is then very very high and once you're on the other side of the firebreak there is no controlling the further spread of the fire. Conceivable it would be desirable if we were to proceed along the lines of the Geneva Protocol to have a separate agreement that would state that these agents are different in purpose, intention and in every other way from the chemical-lethals, but that beyond whatever we have agreed to in the Geneva Protocol that we also make a separate undertaking not to use tear gas in war and not to use herbicides in war, although I would prefer a more sweeping indictment of ecological warfare than the use of an identifiable chemical agent for the destruction of the ecological values of an enemy country. This could be built in, as I say, to a subsidiary agreement to the Geneva Protocol.

However, the present situation is probably not so far from that. It is doubtful that either tear gas or herbicides will be used freely in view of the kind of political reaction that can be expected to them in future conflicts when this one is wound up and it may not be worth the effort to try to negotiate a new one that speaks only to the purpose of the Geneva Protocol. The no-first-use implication is a kind of firebreak but it has some of the properties that I've already alluded to, that once there is any breach of it it then opens the door to the unlimited use of the most violent forms of chemical warfare such as we saw in World War I. For that reason there have been efforts to try to reach deeper into the processes that may lead to the escalation of these weapons and in particular to try to draft agreements that would result in the control of production and stockpiling of these instruments as well as in their first use. This leaves open the question of the way in which a country would respond if it were attacked by chemical weaponry in violation of the treaty agreement and there is an implication that world opinion would have been so mobilized by the very conclusions of such a treaty that the existing forces of world order would be applied in even stronger measure to a violation of such an agreement than they would to ordinary aggressive action. That's a somewhat tenuous hope but it may have some substance to it. But it is one of the serious difficulties in reaching an agreement along these lines -- what use is that agreement to a country that feels that it might still be attacked in violation of it and there have been many many violations of international agreements in the past. The United States as a super power worried about its own interests can take a marginal interest in this question anyhow. Whether or not there is such a treaty, an attack on it by chemical weapons or by any other weapons would result in a reaction of great fury and of great military capacity as you well know. So we're really speaking primarily to our own continental security when we speak to this question. There really is not very much incentive to any other country to enter into such an agreement because there really isn't very much protection afforded to it by its terms. On the other hand most countries don't have very much to gain by staying out of such an agreement. The countries that at the present time have significant capacity for chemical warfare independent of the super powers is quite limited and one can therefore argue that now is a good time to put a stop to the technology race. But the most important element in such a treaty is not the one to

prohibit any use or even the one concerning production and development, but the element that would prohibit the proliferation of chemical weaponry from one country to another. I put special emphasis on this because besides the problem of enforcement of the treaty, which is very difficult, there is also the problem of verification of the treaty involving the production and development of chemical weapons. In the case of chemical weaponry there is a third problem and that is the definition of the prohibited article. These two are somewhat interwoven but it's important to distinguish them. The problem of definition is having a clear understanding of what you have committed yourself not to produce, not to stockpile. You may recall that chlorine was the first gas to be used on a large scale in chemical warfare. It is produced in this country to the extent of 60,000 tons a year for very ordinary civilian purposes like swimming pools, like sanitation of water supplies, as a chemical intermediate and so on. It would be unthinkable to prohibit the production of chlorine gas. It would impose a very great difficulty just in terms of administrative red tape even to keep track of every shipment of chlorine gas that was produced in this country. And the same argument can be applied to at least a hundred other chemicals that are produced in very large quantities and that are routinely shipped in bulk from place to place throughout the country. Their use would unquestionably come within the prohibition of the Geneva Protocol. They are asphyxiating gases capable of severe lethal consequences to people to whom they might be applied and yet it is absolutely impossible to run an industrial society without developing and producing these compounds in very large quantities. So we have a problem of definition of what constitutes a chemical weapon which is very different for production and stockpiling than it is for the use in war of these agents. Needless to say these concerns would apply even more strongly to articles like herbicides -- to the same degree to articles like herbicides.

There are a limited number of compounds for which no peaceful civilian use is known at the present time and these are compounds like the nerve gases. However, the boundaries between them and insecticides are also very vague. If there were an enforceable and verifiable agreement to destroy stocks of chemicals that had no obvious peacetime use a certain amount of research would undoubtedly go into the identification of chemicals that did have a peacetime use and would still be efficient war gases. This is a very reasonable and plausible direction that military chemical research might very well undertake. So there are problems of definition that are very serious. There's also the problem of verification, that is to say, even if we could come to an understanding, and this would probably have to be a rather specialized one taking up article by article of commerce as to which ones should be prohibited and which not, and let us come back again to the example of the nerve gases -- how to know that the other party to an agreement had lived up to their commitment under it is again almost an insuperable problem. We're dealing here with activities that can be masqueraded in chemical plants that are doing other things. This problem will become even more serious in the light of the developments that I mentioned for the safe handling and disposal of chemical agents that I mentioned before because one of the characteristics of a nerve gas production plant as they used to exist a few years ago -- they have been turned off in this country since the U.S. has more than adequate stockpiles -- was that they required the use of very extensive safety equipment and the workers in those plants had to wear gas masks and hoods and protective clothing and all the rest of it. So it did not require very intrusive inspection to discover that this was going on, but one still had to be there on the site.

Further developments already announced by the Department of Defense on ways of preparing nerve gas like materials safely would make even that criterion inapplicable. We are at an impasse at the present time in knowing what kind of agreement would in fact be meaningful and could be applied, either within the letter or the spirit of the law, when it comes to the production and stockpiling of agents of this kind. I think that progress can be made but will have to include an element of openness in the various societies that commit themselves to agreements of this sort that does not now exist. It is an impasse at this time and that's where we stand right now.

The basic policy recommendation that I would make at such an impasse is the one that I stated before, that is, to discover that line or level of activity that can let the rest of the world know that we are on guard, that we are sensitive to the developments that

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may be undertaken elsewhere, that will indicate that we are prepared to escalate our activities in this field but as a deterrent against others doing so that we would hope for this at the present time. This would amount more or less to a unilateral moratorium or near moratorium on chemical warfare activities and it's one to which we have a near approximation at the present time. It might be desirable if there were a limited destruction of our stockpiles.