Much has been written lately about the possible environmental consequences of nuclear war, such as destruction of the ozone layer and "nuclear winter," and how they may affect the United States' strategy of nuclear deterrence. It is asked, how can we retaliate when to retaliate would be suicidal, and if we cannot retaliate, how can we deter a Soviet attack? But this does not have to be a problem. There are many ways we might retaliate on scales that need hardly have such cataclysmic consequences, yet which would involve sufficient devastation to the Soviet Union to greatly discourage it from striking first.

We also find many arguments about the immorality of the massive killing of civilians that, however disguised, is an inherent part of deterrent strategy. But why is it more moral to kill soldiers than the populations on whose behalf they fight? Morality of course requires that we cause the least possible human suffering in prosecuting a war and that we destroy people and property only where that destruction is justified by the value of the ends it is likely to achieve. This usually dictates that we direct our killing and other destruction at military objectives. But when necessity or the goal of minimizing human suffering requires the intentional killing of civilians, as sometimes happens in this age, anachronisms like noncombatant immunity have little place. There is a deeper problem, however. And to the extent that it involves morality, it is an undebateable one: we do not kill anyone without good reason, and we especially do not kill a great many people without very good reason. The problem is more a paradox than a moral issue. We must intend to retaliate in order to deter the Soviet Union from attacking us with nuclear weapons; but after the Soviet Union has unleashed a massive nuclear attack, there will no longer be any purpose in retaliating, at least no purpose sufficient to justify the substantial retaliation we must threaten in order to deter. How, then, can we intend to carry out such retaliation? The answer is that we cannot.

There is a course for addressing the perilous situation in which we are thus placed. And if that course is itself terrifying, it may nevertheless provide far more security than we now enjoy and perhaps as much as we can hope for in the world as we find it today. Simply, we must, through a system of automatic retaliation, deny ourselves the option of declining to retaliate.

Addressed below are questions of whether and how such a system can safely be implemented. First, however, let us consider whether it is in fact necessary. Is it so clear that we would have no purpose in retaliating after a massive Soviet strike? Some might argue that there would remain reasons for retaliating after the threat of doing so has failed to deter such a strike.

In appraising these reasons, the following elusive but critical consideration should be borne in mind. The problem is not simply a difficult or burdensome morality that we might choose to subordinate to our security in the way that societies and individuals frequently derogate their higher aspirations for reasons of convenience or necessity; for, when the time comes to act, the immoral course will do us no good. It may be alluring to think that, if it is necessary that we actually intend to follow through with our retaliatory threats in order to deter we shall simply make up our minds to carry out those threats whether doing so be immoral or not. But if we know that when the time comes to act, the immoral course will do us no good. It may be alluring to think that, if it is necessary that we actually intend to follow through with our retaliatory threats in order to deter we shall simply make up our minds to carry out those threats whether doing so be immoral or not. But if we know that when the time comes to act, there will no longer be any reason for carrying out those threats, we cannot actually intend to. Thus, while we might desire that there would be reasons for retaliating after deterrence rests on the existence of such reasons, deterrence can add nothing to those reasons. They must stand or fall on their own.

Winning. Posited here is a massive nuclear attack, by which is meant the unleashing of a substantial part of the Soviet nuclear arsenal upon American cities. In such a case, victory hardly seems possible in any meaningful sense, certainly not in any sense justifying the sort of nuclear response necessary to achieve it.
"Winning," as the term is used in this context, can only mean that more Russians die than Americans. But to a tragedy in which 100 million Americans die, is an outcome in which 125 million Russians die conceivably preferable to one in which no Russians die? So-called winning, in any case, is not a satisfactory basis for any sane person to take those lives.

Damage Limitation. Many of our nuclear weapons are aimed at military installations for the purpose, it is said, of reducing the harm caused by Soviet weapons. But after a massive first strike, there would seem little value in using nuclear weapons against such installations as a means of limiting damage to the United States. Once a Soviet silo has fired a missile as part of an attack of this nature, any benefit from destroying that silo would unlikely justify the deaths of the persons manning it, much less those of persons in the vicinity or the environmental effects of the weapons used to destroy it. And even if we could concentrate our attacks upon Soviet weapons that remained armed, we would not materially diminish the Soviet ability to complete our annihilation. There is thus little doubt that the net result of our actions would be further devastation due to the provoking of additional Soviet attacks.

Influencing the Political Future of the World. It might be argued that an important purpose would be served by retaliation if it merely prevented the Soviet Union from dominating the world, as presumably it easily could after destroying the United States. But, regardless of how oppressive we may deem the existing Soviet regime, we must recognize that the geopolitical consequences of destroying the Soviet Union are utterly unpredictable; so too are the environmental consequences of the weapons it would take to do it, even upon those nations on whose behalf we would do so. At most, such a speculative end might justify a limited retaliation directed at reducing Soviet military capabilities or eliminating the existing regime to the extent that either could be accomplished with minimal loss of life and environmental harm. That end could not, however, justify the massive retaliation that it is necessary that we threaten-and intend actually to carry out in order to guarantee that the Soviets would not think of striking first.

Legitimizing Deterrence. As a rule there is a sound reason to follow through with threatened punishment even after the action that the threatened punishment seeks to deter has already taken place. It is to deter similar future conduct. Should the Soviet Union destroy an American city, for example, there might be sound reason for retaliating by destroying a Soviet city or by some other action. Or, if one small country with a nuclear capability were to attack another with nuclear weapons, there would be sound reason for the attacked country, or even a third party, to retaliate. Such actions may be necessary to legitimize deterrence-to make it credible for the future. But, in the world that remained after a massive Soviet attack, it is unlikely that a situation of deterrence comparable to that existing now would exist again even in the relatively distant future. The possibility that retaliation would tend to stabilize such a situation is thus much too uncertain an end to justify the destruction that retaliation would entail.

Retribution. We are left, then, with vengeance, or retribution. It has played a significant role in history, often a useful one in maintaining order before organized societies could assume that responsibility. Even today legal theorists devote much thought to the role of retribution in our system of criminal justice; and if they cannot satisfactorily resolve whether retribution ought properly to underlie that system, it remains clear that by frequently providing the motive for punishing, which then deters future transgressions, it has an obvious utilitarian value. But whatever sense retribution may make in the realm of criminal justice, it clearly could never morally justify the killing of millions of people for the precipitate acts of a few of their leaders. Indeed, with a totalitarian state like the Soviet Union, the case against retaliation as an act of retribution could hardly be more compelling.

Ultimately, then, these ends can neither individually nor collectively provide sufficient justification for retaliating in any meaningful way-that is, retaliating with such force that a credible threat to do so would deter the Soviet Union. There remains, however, the question of whether it therefore necessarily follows that we must resort to automatic retaliation. Some would assert that the threat of retaliation would still provide adequate deterrence notwithstanding that after deterrence has failed there are no adequate reasons to retaliate-for two reasons. First, whatever the reasonableness of the arguments set out above, our leaders simply would not agree with them, and thus they fully intend to carry out the retaliation that is taken for granted as a fundamental element of our defense. Second, regardless of what our leaders intend to do or will in fact do when the time comes to act, the more important consideration with respect to deterrence is what the Soviets expect them to do; and
given the scope of the harm that massive retaliation entails, a Soviet belief that there is even a small likelihood that we will carry out such retaliation should be sufficient to deter a first strike. Thus, those who have addressed the paradox of deterrence have generally concluded that conventional deterrence is nevertheless valid.

But there are problems with this view. First, in an open society such as the United States-and one, moreover, that strives for both morality and rationality as it debates its policies-a long term adherence to a policy whereby our security rests on a belief that our leaders will act irrationally and immorally is difficult. We can, for example, ask our candidates what they would do in a particular situation and why they would do it, and it is difficult to conceive of a candidate's convincing rationale for a nuclear response to the type of first strike envisioned here.

Second, it is of course true that even a relatively small probability of massive retaliation is a powerful deterrent. Probably it is powerful enough in most circumstances. (Indeed, in most circumstances, the potential harm to the side that strikes first as a result of the environmental consequences of its own weapons should be a sufficient deterrent.) There may nevertheless arise circumstances when doubts about the other side's willingness to retaliate assume critical importance. The only time either side is likely to seriously contemplate a first strike is when it fears that the other side intends to strike first. In a crisis the Soviets easily may fear that the United States will strike first, if only because they fear that we fear that they will strike first, and so on. (The reasoning that says it makes no sense to retaliate says nothing about whether it makes sense to strike first; on the contrary, that we even might not retaliate, and hence are less able to deter, gives us but greater reason to consider preemption.) Thus, for example, when Soviet-made or -manned missiles in Libya destroy an American carrier, or an important sensor satellite of one side appears to have been sabotaged by the other side, or there occur any of the myriad undreamed-of incidents that could leave terrified leaders of both sides not knowing what to do, save that they better do it first, significant doubts about the United States' willingness to retaliate can be the determinative factor leading the Soviets to attempt a first strike. Similarly, should the United States verge on the deployment of technologies that may render successful preemption viable, a belief that though the United States may well strike first, it will not strike second could weigh heavily in the Soviet Union's consideration of its bitter options.

Some would argue, however, that the massive attack that leaves us no purpose in retaliating is not a likely form for a Soviet first strike to take. Many believe it more likely than the Soviets would launch a preemptive strike disabling all or most of our land-based missiles and bombers, while keeping civilian casualties to a minimum, and leaving to the United States the choice of whether to escalate by direct attacks on cities with submarine-launched missiles. Yet, a major reason offered for the unlikelihood of a massive first strike upon civilian targets is that it would more certainly elicit retaliation, and a central premise here is that such a view may be unfounded. If it is true that a massive attack would place us in a situation where we could find no satisfactory reason to retaliate, such a course must be a plausible one to the Soviets. And even if we allow that such an attack is not the most likely form for a first strike, our vulnerability to it remains a cause, not for concern, but for terror.

The only way to correct that vulnerability is to take whatever measures are necessary to deny ourselves the option of failing to carry out the threatened retaliation that is the foundation of our security.

Several paragraphs below we consider the feasibility of a system of automatic retaliation with attention both to whether we can ensure that it will respond to a Soviet attack, which will presumably be necessary in order to convince the Soviets that it will, and to whether we can ensure that it will not "respond" when there has been no attack. But let us first consider just what sort of retaliation is appropriate, given that, I think we all agree, blowing up the word is not.

Thus, while the retaliatory response that we are irrevocably committed to carrying out must so terrorize the Soviet Union that it will not think of attacking, it must also be tailored to effect the least possible harm should it ultimately have to be carried out. These ends are best reconciled by a plan for devastating attacks on urban areas in as limited a geographical area as possible. The existing situation is distinctly suited for such an approach. The Russia that has stretched half way round the world for the last several hundred years has never been a nation. It has been, and is now, and empire of diverse ethnicities and cultures for the most part forcibly and unhappily united under the domination of Great Russia. The heart of Great Russia is Moscow, a metropolitan area of twelve or so million located at approximately the same latitude as Ketchikan, Alaska, and Edinburgh, Scotland. Four
hundred miles northwest lies Leningrad, a city of almost six million that no longer holds the importance it had under the tsars, but that retains considerable historical and political significance. The irrevocable commitment to the complete destruction of these two cities alone would provide a considerable deterrent to a Soviet first strike. Not only do they comprise much of what Great Russia treasures, but their destruction might lead to the disintegration of the Soviet Union. We need hardly rest our security-and the security of the people of Moscow and Leningrad-on, in this context, so modest a threat. Still, by directing our threat at those parts of the Soviet Union that Great Russia deems most precious, we can achieve a satisfactory level of deterrence while minimizing the harm that carrying out that threat would entail. This is particularly so with respect to environmental considerations, since so much of what is precious to Great Russia lies far north of where the overwhelming majority of the world's population outside of the Soviet Union lives, and the majority of the Soviet Union's population as well.

More specifically, by focusing on the total devastation of all major urban areas north of the 52nd parallel and roughly bounded by the 28th and 50th meridians, we can threaten nearly fifty million Great Russian lives, most of what Great Russia otherwise holds dear, much of the Soviet Union's industry, and the virtually assured disintegration of that union. This would seem a powerful deterrent. It would probably be pointless to direct even a single warhead at the Ukraine, which if more resignedly a part of the Soviet Union than it was sixty (or forty) years ago, is not yet contentedly so. The spectre of an untouched Ukraine with a decimated Great Russia may indeed be more frightening to the Soviet leadership than the thought that they both would be decimated. Similar consideration make a good case against targeting any of the historically rebellious areas within the Soviet Union and a compelling one against targeting any other Communist Bloc country. And environmental considerations would seem to outweigh any deterrent value of targeting anything east of the Urals.

In any case, whatever the precise formula for ensuring to the greatest extent possible that deterrence not fail while ensuring the future of the world if it does the important thing is that in seeking that formula we give up entirely the notion that a strategy of nuclear deterrence has anything to do with planning a war-a notion that somehow has us aiming more than ten thousand nuclear warheads at a country that has not a thousand cities with 25,000 people in them, because, it is said, wars must be fought to win. What we are involved with here has nothing to do with war, not, at any rate, with a war that someone wins.

Is a safe automatic retaliation system feasible? The question is critical and deserving of more thorough treatment than we can afford it here. But certain aspects of such a system do warrant some discussion here to roughly suggest the outlines of the feasibility question, and to suggest that it is a question to which there may well be satisfactory answers.

Let us assume that one hundred warheads are sufficient to provide the deterrence we think essential. Because of the human involvement in the operation of manned bombers and submarines, it would appear that at least in the current technological context the automatic retaliation would have to be carried out by land-based missiles, the most vulnerable part of our strategic arsenal. That vulnerability, however, should not be factor in a system of automatic retaliation, since the main reason that it is presently such a problem, the time required for someone to decide what to do, would not be present.

Consider possible approaches to a safe system of automatic retaliation. At one extreme there is a single decision-making mechanism (term it a launching authority) responsible for launching all the missiles assigned to the automatic retaliation system. Under such an approach enormous resources would be devoted to the development of a highly redundant method of ensuring that those signals that set off a retaliatory response (radar, satellite, and so fourth) are reliable. (Bear in mind that we rely on such signals in any event.) The principal advantages of such an approach are that the concentrated resources devoted to determining whether there really is a Soviet attack diminish the chance of error, and that, simply because there is only one system, there are fewer systems that can go wrong. The disadvantages are that if an erroneous instruction to launch is implemented, the entire retaliatory force could be launched, causing great unwarranted destruction and almost surely eliciting a Soviet retaliatory response, and that because there is only one system, the Soviets have a simpler task of interdicting it.

At the other extreme is a system of essentially independent launching authorities for each missile with each authority having its own facilities for determining that a Soviet strike is in progress. This would diminish the harm that would be caused by an erroneous
response due to an error of one launching authority. It also decreases the chance of a major Soviet response to the launch, both because the Soviet Union would be less damaged by it and because the rest of the system would still be in effect to automatically retaliate against the Soviet action. Such a system is also more difficult to interdict. The disadvantage of such a system, apart from the expense, is that the proliferation of launching authorities increases the chance that there will be an erroneous launch.

There may, however, be ways of addressing that difficulty. For example, each missile that would be fired by one authority could be programmed so that designated launching authorities other than that from which it was fired could send a signal that would destroy it in flight, if they had not also received signals that a Soviet strike was in progress (Launching authorities would lose the ability to destroy missiles launched by other authorities once they too had received signals indicating a Soviet attack was in progress. This is necessary because, if they retained the ability, they would have to use it. That once a Soviet attack is in progress we no longer have an interest in retaliating, and to the extent it remains in our power to decline to do so, we must decline to do so, is after all the problem.) No system is theoretically foolproof, since just as one electronic problem at the point where the decision is made to fire may set off the single highly redundant system, the same phenomenon may mislead each of the multiple launching authorities. But with sufficient attention to requiring whatever redundancy is necessary it seems possible that the chance of a disastrous error could be rendered negligible, and a system of automatic retaliation need not necessarily conjure up visions of uncontrolled doomsday machines. At all events, the question is whether the danger we and the rest of mankind face is greater. I think that it is, if not today, then tomorrow or the day after.

There remains the question of what scope of nuclear attack should trigger the automatic response: that is, what attack would eliminate any purpose in retaliating and thus not be deterred by a mere threat of retaliation without the irrevocable commitment to carry it out? Rather than seek to answer that question here, I will simply point out certain further questions raised by an attempt to answer it. The reason for considering an automatic retaliation system is that it is necessary in order to deter an attack that would eliminate any purpose in retaliating. Such a system could also be considered as a means of discouraging any attack; but at least initially an automatic system seems too frightening to consider in circumstances other than where it is the only alternative. Consider, however, certain implications of the operation of the system described above. If it is difficult to draw the precise line as to what number of warheads constituted and attack that should trigger the automatic retaliation, probably we would have little trouble agreeing that a thousand clearly should. Yet the pre-emptive sort of first strike against our land-based missiles and command centers that many so fear could easily involve two thousand warheads. And while we might theoretically be able to determine where each warhead was headed, it would be quite difficult to be sure that this was merely the type of strike that would leave us in a position where we may still find some reason to retaliate. Thus, even leaving aside whether such a strike would destroy the automatic retaliation system as well, prudence might force us to treat it as the type of attack that should automatically trigger a response.

Moreover, do we really want to permit a situation where we can be placed in the position where the only options are to surrender or to retaliate against Soviet cities, when they had not yet attacked ours, but almost certainly would if we attacked theirs? Would not a system of automatic retaliation that could eliminate the threat of such a first strike be preferable to the prospect of being placed in that position? And what if the Soviets carried out a very limited first strike aimed solely at destroying our system of automatic retaliation? If destruction of that system would leave us vulnerable to a massive attack, can we permit its destruction, which is to say must we not program it so that it is triggered by any attack on itself? And do we desire to remain vulnerable to decapitation strikes? Besides, is it not far from clear that there is a sensible response to any likely form of first strike, and thus may we not be vulnerable to any course the Soviet Union might choose? Would not a comprehensive system of automatic retaliation to any other than accidental firing on the United States greatly diminish all such dangers, perhaps enough to justify its own dangers, particularly if some form of system is necessary anyway? What after all are we saving by doing otherwise-the opportunity to have portentous decisions made in five or twenty minutes by men who are themselves about to die?

Recognizing, and sharing, a natural repugnance toward schemes for placing the world's fate in the hands of anything that even hints of a doomsday machine, I nevertheless am drawn to believe that a
comprehensive system of automatic retaliation is the most sensible course available among the limited and invariably treacherous options that nuclear reality has left us. For genuine doomsday machines abound today, and those that daily proliferate are subject not merely to their own limitations, but also to the sometimes frantic judgements of numerous more and less rational individuals endlessly speculating on what is in the others' minds and what they should do about it. In such circumstances, does it not make sense to eliminate the least predictable element from the situation?

It is, of course, also not a little absurd. But nuclear arms in general and deterrence in particular have plunged us, apparently irreversibly, into the realm of the absurd, and we have little choice but to make the best of it. Consider, indeed, the full extent of the absurdity of our situation. While we must seek to establish an automatic system that will be absolutely certain to unleash our missiles in the event of a Soviet attack without our having any capability of interfering, our real desire, if we are sane, must be that, in the event such an attack occurs, the system would not work after all-no missiles would fire. For we will no longer have adequate reason to kill anyone after such an attack, and would prefer to devise a system that was actually a fraud, if only we could convince the other side it was real, just as we would prefer to have our missile silos full of grain, if only we could be sure that the Soviets believed they contained missiles.

The present situation is not less absurd. We rely on the hope that the Soviets will believe that we will act insanely (given the currently contemplated scope of retaliation) or immorally (under a more limited retaliation plan) and that we will do so at a time when doing so cannot possibly do us any good. At the present time, the Soviets probably believe that our leaders are just mad enough or just odious enough to retaliate in very substantial fashion, especially since the circumstances in which those leaders will make the critical decisions will not lend themselves to sage reflection. Moreover, the same weaknesses in our command and control structure that raise questions about our ability to retaliate raise at least as serious questions about our ability to decline to retaliate. So we enjoy some measure of security. But reason cannot be ignored forever, and what reason tells us here is that if the Soviets strike, it makes no sense whatever for us to retaliate. Sooner or later we will have to figure that out, with the Soviets not far behind, realizing not only our weakness but that our weakness makes us more dangerous. So if what I propose here is absurd, it at least is, to use Joyce's words, a logical and coherent absurdity and, hence, immeasurably superior to the illogical and incoherent absurdity in which we are presently embroiled.