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CIVIL DEFENSE AS INSURANCE AND AS MILITARY STRATEGY

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The debate on civil defense is a real paradox to the casual American newspaper reader. On the one hand there seems to be very little disagreement in the public mind as to the wisdom of spending one-half or more of the Federal Budget for military defense. On the other hand, the Congress, which has certainly not been parsimonious on military spending in general, (and has in fact frequently added items to the military budget, not asked by the Executive) has consistently, for the last three years, refused to appropriate funds for the key parts of the administration's civil defense proposals. At the same time military analysts have demonstrated many connections between the country's civil defense and military defense activities.

I. Civil Defense and American Society

Why then is there such a disparity of debate? The solution of this paradox may well be related to the following reasoning: All the factors which we commonly associate with "increasing the standard of living" are also factors which increase our vulnerability to attack. Therefore, civil defense interpreted as the means of increasing our resistance to attack, is equivalent in many respects to reversing the very forces which give rise to the American prosperity.

The same argument also relates to the less material values of our society: to our free, generally unregimented way of life. As we shall see later, Civil Defense on a large scale can really only be effective if it is interwoven

extensively in the civilian life through training, volunteer activities and the like. Ultimately, therefore, the debate about implementation of civil defense programs raises the question whether a really large civil defense program would destroy the very values around which we are centering our contests with other societies.

Let me illustrate these points with some examples. During the last decade it has been possible to decrease the inventories of food in local groceries substantially because improvements of transportation have made it possible for the store to replenish its shelves at shorter notice. However, this transportation depends largely on highway transportation which in turn depends on the availability of gasoline. Availability of gasoline in turn has become almost entirely dependent on electric power since even at the local gas station the gasoline cannot be pumped from the underground tanks without electricity. We therefore suddenly find that the food supplies locally available constitute only two weeks rations in most communities and replenishment depends on complex systems which are surely going to be disrupted in any immediate post-attack situation.

Let me give you another example of this kind of situation. Most of the cows on American farms are being milked electrically; as a result, in case of power failure there is not enough trained manpower around to do this job. Far from being a trivial problem, this is again one of the cases in which increased efficiency in agricultural production has contributed to its vulnerability. The recent power failure in the Atlantic States has clearly demonstrated that all of the analyses of availability of power in a post-attack area with which I am familiar are quite meaningless. Most of such studies have only inventoried surviving vs. damaged facilities without investigating

the complex systems aspects of the problem. The same criticism applies to most analyses of water supplies, transportation systems, much of communications, etc. In short, the very interdependence of the different elements of our society creates not only the basis of productive strength but also the vulnerability of our system.

One can, of course, both overstate or understate the importance of these problems to the whole civil defense question. Even if the more complex arrangements are destroyed, people might find ingenious solutions to revert to more primitive means of life. On the other hand, there are certainly many cases in which this is simply not possible. What I am trying to emphasize here is that survival after nuclear attack is a largely unknown topic, since most of the studies with which I am familiar are either too superficial or treat only a small portion of the problem in extensive detail. The proposals for a "hardened society" as envisaged by the advocates of a strong civil defense, either would have to disrupt some of this interdependence or otherwise describe a system whose actual performance, in particular in the immediate post-attack period, would be far from realizing expectations.

II. Technical Knowledge and Ignorance

When viewing the debate about civil defense with some detachment one is impressed by the fact that there is really very little disagreement on the basic technical facts concerning the means which would have to be taken to protect the population from the immediate physical effects of blast, fire, radiation and from fallout during the post-attack period lasting 1-4 weeks. There is little disagreement that a full fallout shelter program could be provided technically for a national cost in the \$10 billion range. There is also little disagreement that blast and fire protection to some reasonable

standard could be produced in most of our cities for costs in the neighborhood of \$500.00 per person making use of the facilities.

The problem of the actual occupancy of shelter is generally dealt with by arbitrary assumptions, but where there is little evidence that the assumptions are right. In the case of fallout shelter, there is a time of the general order of one-half hour available between attack and occupancy. This means, in principle, that one need not associate a fallout shelter program with the need for warning; nevertheless, it is totally unclear what fraction of available shelter would in fact be used, depending on local circumstances such as separation of families, panic, the general state of training, or even the weather. In the case of blast shelter, actual occupancy depends entirely on the effectiveness of warning. Many warning systems have been discussed, ranging from the usual sirens to the NEAR system which carries warning signals into almost all houses over the power wiring. It is again quite unclear what fraction of the people would actually use the available shelter space on the basis of warning only. Presumably, warning could either be based on strategic evidence, that is, on information indicating imminent attack based on deteriorating political conditions, or, for example, through signals from our early warning radars (BMEWS). How credible such warning would be to the population so that shelter would actually be taken is quite uncertain and depends again on many unpredictable factors such as previous false alarm rates, training, etc., in which we are again in a truly unknown area. Therefore, the cost of really effective shelter is unknown much more because of these circumstances than through our ignorance of construction costs or of the physical properties of shelter.

There is also surprisingly little disagreement as to the technical effectiveness of shelter protection, considered by itself, toward reducing casualties in the event of nuclear attack. There have been many such studies based on varieties of attack models, based either on anti-population attacks, attacks only against the U.S. strategic force or models intermediate between the two. These calculations have been widely published, in particular in Congressional Hearings. Civil Defense consisting of fallout shelter only can save large fractions of the population at risk through fallout from attacks directed "carefully" against U.S. strategic targets; this might be the pattern if the Soviets chose to make a surprise first strike "counterforce" attack against U.S. missile and long range bomber sites, but specifically avoiding population centers. Such a move on the part of the Soviets is clearly remote considering everything from the present political situation, to the fact that, short of major technical changes, such an attack would lead to unacceptable retaliatory damage to the USSR. In moderate attacks directed against population, savings range from 20 to 30% of the population, but casualties are also at least as high; moreover most studies tend to be optimistic in terms of life-saving potential of fallout shelter through omission of effects of partial occupancy, of in-shelter casualties, of fire damage and of post-attack casualties. For very heavy attacks (more than 5000 megatons delivered, a figure presumably within Soviet capacity), the immediate problems of survival through shelter may not be the controlling factor at all. x x

The previous discussion relates to fallout shelters only. Many studies of casualty reduction of blast and fire shelter also exist and predict substantially larger casualty reductions if the physical effects of protection alone are considered; again there is little controversy about these technical results.

The question may thus well be asked "Why, if there is so little disagreement on the technical facts, is there so much disagreement on what should be done"? The answer is that very few of the studies of the civil defense problem ask the really hard questions which should be asked. First, almost all the studies omit the casualties which would occur in the immediate post-attack period, that is the period in which the very interdependence of our society has produced its greatest vulnerability. Attempts have been made to draw analogies between the conditions expected and those having occurred in the various disasters of history. However, none of the analogies I have seen are particularly valid. In particular, in all past disasters misfortune has struck only a few in the midst of many not so affected, and help from the outside played a very large role, not only in immediate aid but also in long-range recovery.

One of the most serious problems involves the question of medical care. Even in peace-time U.S.A. there is an overconcentration of doctors in our urban areas. If there is an anti-population attack, then the cities would suffer heavily disproportionate casualties. As a result, the ratio of doctors to the surviving population would be decreased locally even substantially below the peace-time value, while the number of persons requiring medical care would, of course, be vastly larger. This circumstance alone could greatly distort the picture of effectiveness of shelters. I note that the present marking and stocking program of the Office of Civil Defense gauges its supplies to the "well population." The original prescription for the amount of water to be stocked would have been seriously inadequate for even a small component of sick people. However, it appears that the water supply stored in most buildings in its piping system would be adequate under most circumstances provided

the various shut-off valve mechanisms in the building remain intact. However the question of medical supplies available in-shelter still poses serious dilemmas. If the supplies are to be of the nature that they can be administered by lay personnel, then the more powerful ^{drugs} drugs can not be stocked in the shelters on a routine basis. On the other hand, it is in general impossible to anticipate that a professional medical man will be available in each marked shelter space. X

As mentioned above, the very magnitude of the destructive effects predicted in nuclear war gives great importance to effects which are inter-dependent, that is in which the damage to one social system prevents recovery of another. In this general category is the question of disruptions of the ecology of our vegetation; for instance, the radiation sensitivity of our forests is many orders of magnitude higher than that of certain primitive shrubs. Destruction of forests, either by fire or radiation, would disrupt the pattern of watersheds. This, in turn, would lead to heavy flooding. This is just one example of a serious ecologically disruptive chain induced by nuclear attack.

Although many of the important but partial facts are known, evaluation of the total consequences of these major ecological disruptions is based on undocumented judgments, either on the optimistic side, as for example in the "Harbor Summary Study Report," or on the most pessimistic side. Scientific answers replying to these hard questions are simply not available.

Even more indefinite are the technical facts relating to the social aspects of the civil defense question, both in relation to popular acceptance of civil defense and to the effect of nuclear attack on our social systems.

The whole question of "in-shelter behavior" is certainly controversial. The limited exercises which have been carried out usually involve volunteers or military personnel and hardly represent a cross-section of a population under

stress. Two groups of psychologists when asked to give an opinion as to the effect of a large scale U.S. civil defense program on the likelihood of nuclear war might give totally different answers. There is a group of psychologists who believe that whenever a society prepares for an event, it subconsciously makes this event more likely to occur. In contrast another school of psychologists believes preparation by means of civil defense for nuclear war to be the only hopeful means by which the U.S. population could become aware of the realities of such a catastrophe, and therefore that civil defense would be a means of averting rash action on the part of U.S. leaders. The key question remains: how would the existence of a civil defense program affect the willingness of the U.S. to consider nuclear war as a serious tool in foreign policy? To this query we not only have no scientific answer, but we are even faced with widely differing judgments by social scientists.

Thus, independent of the actual strategic consequences, the psychological forces may actually be more controlling on the effect of a civil defense program on the reaction of the major powers. The extent to which this is true depends, of course, greatly on the public indoctrination which accompanies such a program. We are thus meeting here another dilemma: as mentioned above, the degree of utilization of shelter and therefore the effectiveness of shelter depends greatly on the training and indoctrination of the population. Therefore, it is hard to imagine an "inobtrusive shelter program" which will also be effective on a large scale. Therefore, civil defense in contradistinction to other forms of military activity involves much more interweaving of military and civilian activities.

To summarize this part of the discussion, I find that in the debate about civil defense the easy technical questions have been "over-analyzed" while the hard questions have been under-analyzed; the really difficult problem remains the subject of judgment rather than technical fact.

III. Civil Defense as Insurance or as Defense Strategy

One can approach the question of civil defense from a somewhat different, less scientific point of view. One can ask whether we should engage in civil defense motivated by one's natural desire to protect oneself from possible disaster, even in the face of all the uncertainties mentioned. Here one has to distinguish clearly between two alternate concepts. One approach is to look at civil defense as an insurance measure, that is, a measure which will reduce the disaster impact of nuclear war on the one hand, but which will not affect the likelihood of this disaster happening. The other view is to look at civil defense as part of our over all strategic pattern, that is to consider civil defense in balance with our other defense efforts and to ask the question whether civil defense is or is not required to supplement military defense to make our total military effort consistent and more effective. These two points of view are, of course, not entirely mutually exclusive. Calling civil defense "insurance" does not exclude taking the assistance of a civil defense program into account when making decisions. Conversely, a civil defense program which is intended to be strategic will, of course, serve in the insurance role also. Nevertheless, if a civil defense program is sufficiently small and does not intertwine deeply into the daily activities of the citizenry one might legitimately consider it as an insurance program but not a strategic measure. A small civil defense program would reduce casualties by a significant amount but under all models of a major nuclear exchange would still leave such vast devastation and death that it is hard to imagine that the decision-making progress of a

government would be affected by the existence of such a small civil defense program. If, on the other hand, one considers a "large" civil defense program as part of the country's total strategic position, then one is also forced to consider the effect of a civil defense program on the decision making process, not only of our country and its allies, but also its adversaries.

The main utility of a "large" civil defense program in the strategic picture would be to make it possible for the U.S. to consider a first nuclear strike against the Soviet Union as a response to threatening moves by the Soviets not involving a strike against the U.S. homeland. A "large" civil defense program would then limit damage to the U.S. which would be produced by a Soviet retaliatory strike. To be more specific a large civil defense program has the primary effect of releasing at least part of the U.S. population from its role as "hostages" in today's nuclear world.

Under these circumstances one has to ask what an adversary may have to do to defeat the protection offered by civil defense, and whether the price the adversary would have to pay would be more or less than the cost of the civil defense effort.

Quantitative evaluation of this so-called "exchange ratio" is, of course, difficult since so many assumptions have to be made as to type of shelter program, the level and strategy of the attack, etc. In particular, since the steps visualized above imply that the U.S. would be struck by the remnants of a Soviet force which has escaped a U.S. first strike, then the answer would of course be sensitive to the assumed effectiveness of this U.S. attack. It is hard to generalize conclusions from studies about such an "exchange ratio" but it does appear likely that should an adversary desire to defeat the purpose

of civil defense in terms of reduction of casualties, by raising the level of his attack, he could in general do so at a cost lower than the cost involved in providing the defense.

This quantitative conclusion may not be generally valid; it applies however, always when the defensive measures are intended to be sufficiently massive to hold casualties to reasonably low levels. Therefore, "strategic" civil defense can validly be considered as part of the nuclear arms race: a large U.S. civil defense program might initiate another round of escalation leading to higher levels of strategic forces on all sides without an increase in our so-called "security."

The great weakness which has been inherent in all considerations of a "large" civil defense program is the omission of post-attack casualties. As I have discussed earlier there is a real lack of understanding of the nature of the immediate post-attack world; in particular, a lack of understanding of those special factors which pertain to the U.S. by virtue of its highly developed interdependent society. As long as these unknown factors are simply ignored, any estimate of civil defense effectiveness would always be optimistic and therefore the kind of strategic calculations referred to will give results which tend to overestimate the life-saving potential of civil defense.

A large U.S. civil defense is of little value as long as the "nuclear stalemate" remains our main insurance against large scale nuclear war. If we are including ^a massive U. S. first nuclear strike against USSR strategic targets as a serious possibility, then civil defense might substantially assist in reducing U.S. casualties against subsequent USSR retaliation: the reason being that civil defense would have to deal only with the remnant of a USSR force ~~missing~~ ^{escaping} a first U.S.A. nuclear "counterforce" strike. It is however hard to

imagine a civil defense program of sufficient magnitude and organization to substantially influence U.S. decisions to initiate such a blow, and I believe it is certainly not desirable to even consider this possibility as a motive for a U.S. program.

To summarize, civil defense is a poor barricade to greatly reduce casualties ~~against~~ ^{from} a large scale attack by the Soviet Union or another power which might have acquired a large nuclear striking force in the future, and it may initiate another round of escalation into the nuclear arms race. This reasoning will be attacked by many who might question: How do you know that our decision to deploy civil defense will affect the military planning of our adversaries? Would the Soviets not do whatever they planned to do anyway whatever defensive measures we undertake? A critique of this kind is obviously difficult to answer since we cannot carry out controlled experiments on Soviet response. We do know that the Soviet Union is very sensitive to U.S. moves in many military areas -- we can trace many Soviet activities to a response to specific expansion of our military power. In short, as long as we consider the nuclear stalemate between the U.S. and the USSR to be a fact of contemporary life, a large civil defense program would only raise the level of armament on both sides of the Iron Curtain to a higher level without an increase, and possibly a decrease, in our security.

A topic which has recently been discussed extensively is the connection between "civil defense" and what is commonly known as "active defense". Under the term active defense we would include fighter planes to attack incoming aircraft, ground-to-air interceptors, and AICBM missile systems designed to down incoming ICBM's. Air defense systems are in existence such

as the Nike-Hercules installations around our cities and the fighter squadrons based at various air fields. It is recognized that the importance of such defenses is deteriorating unless we succeed in developing and deploying means of defending against long range rockets which could be launched at the Soviet Union and other parts of the world. During the last decade design and development of such AICBM systems has been in progress, culminating in the much-discussed Nike-X system which is still in its development phase. Full deployment of such a system would involve a national expenditure in the neighborhood of \$20 billion and would probably be the most complex technical undertaking ever attempted. The pros and cons concerning such deployment are numerous and involved and I will not discuss them here.

"Active defense" in principle does not involve many of the non-technical problems discussed above in connection with "passive", i.e., civil, defense. If a warhead is destroyed before detonation too near the ground we are not concerned with the ecological and other post-attack problems, which make protection by sheltering of the population of uncertain over-all survival value. "Active" defenses can be procured and manned in the traditional professional U.S. military pattern without involving civilian life and attitudes. On the other hand active defense shares all the concerns expressed above in connection with the role of any defensive measure in relation to possible escalation of the nuclear strategic arms race.

Whether or not one draws the conclusion that anti-ICBM defenses should be deployed, it is clear that a Nike-X defense can generally be defeated unless accompanied by some civil defense also. The reason for this conclusion stems from the fact that the Nike-X defense system is based on short-range interceptors which can kill incoming warheads once they have entered the atmosphere, and are identified by their interaction with the atmosphere. This means that

this defense is local and can only be deployed around specific centers such as cities which are a concentration of population or around any other targets which have high military value. If, however, the adversary decides to deliberately target his weapons "up-wind" so that the resulting fallout from a ground burst would reach the defended city, then the entire defense could be circumvented. Therefore, if plans for full-scale deployment of an active missile defense of the Nike-X type are to materialize, then fallout shelters become a necessary component of such a decision.

Since the establishment of an AICBM system will extend over a considerable period, the stocking and marking program will have resulted in fallout shelters in many metropolitan areas before an AICBM system could be established. However, the problems associated with managing such a fallout shelter program to maintain its readiness remain.

If it were possible to devise an active defense system which could intercept incoming missiles well above the atmosphere, that is, if it were possible to develop an "area defense", then the coupling between fallout shelters and active defense would of course be reduced.

IV. The Current U. S. Program

The consequences of a civil defense program are thus entirely different, depending upon whether it is designed to be a small, insurance type, program, or a large program with strategic objectives. Our current program fits logically only into a purely "insurance" role, but many proponents of a stronger program clearly would like to see a strategic civil defense role.

I should now like to examine our present civil defense activities in relation to the foregoing considerations. After the war the U.S. Government changed its organization on civil defense several times. At present responsibility for providing shelter, for providing warning, for carrying out

training activities of shelter personnel and for similar activities, rests with the Office of Civil Defense which was recently transferred from the direct management of the Defense Department to that of the Army. On the other hand, responsibility for monitoring the "hardening" of such functions as electric power, water supply, agricultural supplies and the stockpiling of medical supplies rests with the different major government departments such as the Department of the Interior, Department of Agriculture, Department of Health, Education and Welfare, etc. These activities relating to civil defense are in turn coordinated through the Office of Emergency Planning which is a part of the Executive Office of the President. The different agencies have to budget for these protective activities in competition with their regular civilian functions, since each agency operates under budgetary ceilings set by the Bureau of the Budget. In addition, each agency has to defend its program before different committees of the Congress whose views differ sharply as to the wisdom of saddling the particular agency with a civil defense function.

It is thus clear that a coherent plan of civil defense becomes very difficult to recognize. The result has been that the different activities attempting to decrease the vulnerability of some of our general services have been fairly rudimentary; the recent power failure in the East certainly bears witness to this point. The part of the program which has been much more in the public eye is the one under the Office of Civil Defense now reporting to the Army. The largest part of the activity administered by this office during the last few years is the "Shelter Survey." This program consists of tabulation of existing shelter spaces in public and private buildings and a

program of computation based on procedures developed by the National Bureau of Standards for evaluating the protection factor by which the gamma radiation from fallout would be reduced at various locations within the buildings. When the protection factor exceeds certain minimum standards, the Office of Civil Defense attempts to negotiate an agreement with the owner of the building which permits the Office of Civil Defense to stock the building with food and other shelter supplies in exchange for the owner's willingness to have the space marked as shelter, and for keeping the space unoccupied. This program has been proceeding at a somewhat variable pace in different parts of the country. Currently about 136 million fall-out shelter spaces have been identified, about 75 million have been marked and stocked with supplies, and water has been provided for about 50 million. Most of these spaces are of course in the metropolitan areas where heavier building construction is prevalent. One should, of course, not confuse this number of spaces with shelter which would actually be effective for fallout protection in the event of an attack. For one thing, the distribution of these spaces does not necessarily correspond to the region of greatest need. As an example, there is hardly any fallout protection in rural areas; I note that under an "anti-population" attack protection of the cities against fallout but not from fire and blast would not suffice, but many rural areas would be "at risk" from fallout only.

The plans for managing the identified shelter spaces have lagged considerably behind the task of identifying, stocking and marking them. In order to make a shelter space useful there must be pre-trained personnel; in addition, the readiness of the shelter supplies has to be checked periodically in order to prevent spoilage and theft. It had been the intent of past and

current plans to staff such activities primarily by volunteer help; success in this respect has in my view been not too great. During the last three years, recognizing that the marking and stocking program could not meet the needs of "full fallout protection", the Office of Civil Defense introduced before the Congress its controversial "Incentives Program." Under this program institutions such as schools, colleges and hospitals were offered a Federal subsidy provided they were willing to construct future buildings, in particular those including large public rooms, to meet specifications for fallout shelter set by the government. This subsidy was designed to cover only a partial contribution to the incremental cost incurred in providing the shelter space. In essence, then, the plan was to constitute a cost-sharing plan between the Federal Government and the country's schools, colleges and hospitals to provide fallout shelter. This proposal was not accepted by the Congress and is not now contained in the Army's proposal for the next fiscal year. I have always been critical of this proposal since it in effect shares the burden for civil defense with our schools and hospitals which are themselves hard-pressed for support and which certainly have no special obligation to contribute to this form of defense.

The history of this attempted cost-sharing program brings into focus the principal aspect by which civil defense differs from other national defense activities. In the U.S. national defense is traditionally financed through taxation, with the Federal Government paying for professional manpower and for the purchase of the necessary material, in general from profit-making industries. In peace time civilian activity is in general quite independent from the military establishment other than through the impact of the tax load and through the draft. Civil defense, to be effective, has to break this pattern and a great deal of the resistance to civil defense stems from this

very fact. It is my view that not anywhere near as large an effort as is possible has been made to carry out at least an "insurance" type of civil defense program along a professional pattern, apart from ordinary civilian life.

At present calibration of radiation instruments is being handled by commercial contractors but maintenance of shelter supplies, and thus assurance of their availability in case of need, is left to volunteers. In addition the specially trained personnel for the roles of shelter manager and radiation monitor are to be drawn from volunteer groups; some of these are police and fire department members participating in civil defense outside their regular duty house. ^{no} ~~se~~ *

A group of shelter managers and radiation monitors could as well be trained professionally and be paid by local or Federal government. All this would, of course, add to the "visible cost" of civil defense; however, if civil defense is to be acceptable at all in competition with other forms of defense it should be made acceptable in terms of its real, rather than partial costs.

A further great advantage of greater Federally-sponsored professional involvement in civil defense would be to increase its effectiveness in rescue and disaster operations not associated with war. A professional civil defense corps has clearly a great deal of ability to cope with flood or earthquake devastation. The Canadians have operated a professional civil defense branch of their defense establishment for some time. The Canadian civil defense establishment is operated under the direction of the regular Canadian Army units; regular training exercises in re-entry into fallout areas and in rescue in other disaster situations are carried out routinely. I recognize that the

effectiveness of an all-professional civil defense effort is limited without extensive civilian participation. On the other hand, an activity handled primarily under professional management avoids the largest disadvantage of civil defense over other military programs; namely, the interweaving of civil and military activities. This means that as long as one would like to restrict the role of civil defense to the "insurance" role rather than the strategic role I feel that a large fraction of professional involvement, generally funded by the Federal Government, should replace extensive volunteer activity in peace time.

V. Conclusion

To summarize, I would like to state that my position towards an extensive civil defense program is largely negative, considering all the points raised in this discussion. As part of the general strategic picture it is a poor bargain in that it can be defeated by increase in the military forces of an opponent at generally lesser cost than the cost of the civil defense system to the U.S. Even ignoring the possible USSR reaction, a large scale civil defense system may be of dubious effectiveness unless many problems which go much beyond the simple questions of shelter performance have been solved. In particular, the problem of the immediate post-attack situation, apart from the need for shelter, has received so little detailed attention, that most estimates of the life-saving value of civil defense must be viewed with great skepticism.

Among the worst features of a really effective civil defense program, if it could be generated at all, is the deep involvement which it produces among the civilian and military aspects of American life. The situation looks more favorable in relation to a civil defense program of more limited