

Nuclear attack and civil defense: a review

Rogers S. Cannell, *Live: A Handbook of Survival in Nuclear Attack*

Pat Frank, *How to Survive the H Bomb—and Why*

Mel Mawrence (with John C. Kimball), *You Can Survive the Bomb*

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Subsequent events seem to indicate that, when President Kennedy, in July of 1961, made his appeal for family fallout shelters, he was not doing so because he thought the shelters would protect a large part of the public from a likely nuclear attack. Rather, it seems, his intent in the shelter program, as in the call-up of reserves that took place at about the same time, was to enhance the credibility of our asserted determination to defend our position in Berlin.

Whatever the President's intent, his appeal touched off extensive public interest in shelter programs and in civil defense in general; it also touched off extensive discussion of the desirability and utility of a shelter program. By now, the public interest, faced with a lessening of tension over Berlin and a lack of direction from a confused Administration civil defense program, seems to have died. The discussion of the possible strategic consequences and the effectiveness of fallout shelters remains with us, although in attenuated form.

Probably the most extreme assertion of the effectiveness of fallout shelters was *Life* magazine's statement, endorsed by the President, that "Prepared, you and your family could have 97 chances out of 100 to survive."

A more moderate position, which emerged later, went something like this: "In the event of a nuclear attack, a fallout shelter program would probably save a significant number of lives. It is therefore simple common sense and elementary humanity to try to save those who can be saved." Those who feel that a fallout shelter program would be ineffective argue that the slight (if any) mitigation of disaster provided by a fallout shelter program is not worth the effort or the strategic cost.

One of the basic points at issue here is the question of the type of attack that is likely. All of our estimates of the results of nuclear attack are just that—*estimates*. Nobody is certain about the effects of a large-scale nuclear attack; what we have are extrapolations from much smaller scale disasters: conventional bombing, the Hiroshima and Nagasaki atomic bomb attacks, and nuclear tests. These estimates vary greatly depending on the type of attack that is postulated. Among the variables are the type of target (military bases or population and industry centers?), the number and size of bombs used, the place of explosion of the bombs (air or surface bursts?), the weather at the time of the attack, and the point in the future at which

the attack would take place (assuming that the destructive capabilities of weapons and the delivery capabilities of the enemy will increase with time).

Those who argue for a fallout shelter program generally agree that such a program would not make much difference if a Soviet attack were designed to kill as many persons as possible. Rather, they argue, because of limited Soviet delivery capability and the fear of retaliation, an initial Soviet attack would be made against our missile bases and airfields. In this situation, they assert, the bulk of the population would have ample warning time to get to its shelters. Since it would be far removed from the actual targets, its primary danger would come from fallout, and the effects of blast and heat could be disregarded.

Those who feel fallout shelters to be relatively useless challenge the presumption of Soviet rationality which underlies the assumption of a counterforce strike, quoting Defense Secretary McNamara: "I think it is at least as likely that our cities would be attacked as that our military targets would be attacked. I don't share the view of some that only the military installations would be targeted" (*New York Times*, November 18, 1961). Further, they argue, even if the attack were directed primarily at military installations, the diversion of only a small part of the attack to population centers would result in blast and fire danger to a large part of the population. Even if such a "bonus" strike were not intended, there would be inevitable damage to those cities near the target military installations, and to cities hit by bombs which had missed their intended military targets. In this situation, the primary danger would not be from fallout, but rather from blast, fire, and heat, against which fallout shelters provided inadequate protection.

At this point, those who are opposed to

fallout shelters divide ranks. There are some, like Representative Chet Holifield, who argue that the ineffectiveness of fallout shelters demands a more extensive blast and fire shelter program. The others argue that a more extensive program of this nature would require a level of expenditure and regimentation of American society that they are unwilling to undertake.

The question of warning time is also at issue. Even when the proponents and opponents of fallout shelters are talking about the same kind of attack (i.e., one on military installations), they disagree as to whether the civilian population would have adequate warning time to get to shelters. The work of the National Research Council's Disaster Research Group and of other students of small-scale disasters has shown that the bulk of the population is not responsive to sirens. Would other warning systems (such as NEAR) mobilize them, or would most people refuse to recognize the danger until it was too late? Would there be an immobilization reaction which would result in loss of time? If the attack came at times when families were dispersed, would valuable time be lost while family members sought each other out? That is, would family members be willing to be separated from each other, each counting on the others securing shelter where they were, or would they react like former President Eisenhower, who said, "If I were in a very fine shelter and they [his family] were not there, I would just walk out. I would not want to face that kind of a world and the loss of my family" (*New York Times*, October 18, 1961).

Other aspects of shelter effectiveness are also at issue. Would a shelter program merely cause the enemy to increase the effectiveness of his weapons (for example, using cobalt or sodium bombs to increase the resulting radioactivity), thereby eliminating the advantage gained from the

shelters? Even if this were not done specifically to counteract the effect of the shelters, would the shelters become obsolescent due to the increased effectiveness of new weapons? Would the enemy have the capability to launch a second attack some time after the first? If so, would shelters be adequately supplied to enable occupants to remain underground for a longer period?

The final point (and perhaps the most basic point) at issue in measuring the effectiveness of a shelter program, is whether the effectiveness should be measured in terms of numbers of lives saved, or number of lives lost. That is, *is* twenty million lives lost better than forty million lost? Is there any value to saving 80 million lives if 100 million die?

Shelter advocates and opponents are also in disagreement on the quality of shelter life and of life in the post-attack world. Most experimental studies of shelter life seem to show that a two-week stay in a shelter has no major detrimental effects on the inhabitants, although the results of a few studies go in the opposite direction. Shelter opponents, however, argue that these studies are not realistic, as they do not permit evaluation of the effects of the anxiety induced by a real attack situation, where the inhabitants would not know how long they would have to remain in the shelter, would be separated from their families, would have a feeling of isolation from the rest of the world, and would be anxious about the future.

The nature of life on emergence from the shelter is another point of disagreement. Shelter advocates argue that, although not comparable to our present standard of living, life for the survivors in a post-attack period would be better than it is at the present time in many parts of the world. Moreover, it would be possible within a comparatively short time to regenerate our industrial plant and present standard of living. Shelter op-

ponents focus on the ecological problems that would result from the death of trees and some kinds of animals. They talk also about public health problems resulting from decreased resistance of a population which had inevitably been exposed to *some* radioactivity at a time when disease might be expected to be common. They argue that insects, bacteria, and rats (all much more highly resistant to radiation than human beings) would be abroad in a world of ruptured sewers, many dead bodies, and inadequate medical personnel and facilities.

At this point in the argument, another division in the ranks of shelter opponents emerges. Many who are opposed to *individual*, or family, shelters, constructed on a personal basis, favor community or group shelters, built by voluntary groups or by the government. They point out that many of the difficulties of life in individual shelters, such as feelings of isolation and abandonment would be lessened in group shelters. Moreover, the existence of large numbers of group shelters open to the public would also solve the problem of shelter for persons away from their home shelters, and for those who did not have the foresight, funds, or opportunity to build a family shelter. Thus, the unpleasant and widely discussed problem of whether to admit one's neighbors to one's shelter would be eliminated.

Group shelters would also make life in the post-attack world easier. Group shelters could be equipped with tools and supplies that would permit the rehabilitation of the economy. The effectiveness of the group shelter would be greater if the group did not consist primarily or only of those who fortuitously happened to be near the shelter at the time of attack, but rather if it contained at least a nucleus of trained persons with a variety of skills. General public shelters and shelters for schoolchildren or other institu-

tional occupants would not meet this requirement, or at least be less likely to do so.

The argument over the desirability of a fallout shelter program has two aspects: its strategic effects (that is, its effects on our foreign policy and that of the Russians) and its effects on American society and economy.

Some shelter advocates do not base their argument solely on the desirability of protecting the population in the event of attack. They argue also that a civil defense program is necessary in order for our deterrent power to be credible. Otherwise, we might well be subject to nuclear blackmail because our inability to protect our civilian population would make us less willing to accept a nuclear attack in return for holding fast to our position. If we are ready to withstand a nuclear attack, the Russians will be less aggressive.

Shelter opponents argue the other side of this coin. If, they say, our deterrent becomes more credible, then the enemy is more likely to expect an attack from us. That is, if we can withstand their retaliatory attack because of our shelters, then we may be more likely to make a first strike. The enemy, thinking this is so, might well decide on a pre-emptive strike. The possibility of this would be enhanced because shelters are more valuable if the population receives the more extensive warning that comes with being the first to strike. Moreover, say shelter opponents, if shelters make us more resistant to nuclear blackmail, they may also encourage us to be more adventurous in our foreign policy, and to be more willing to undertake a first strike. That is, the question of what constitutes sufficient provocation by the Russians for us to respond with a nuclear attack depends in part for its answer on the seriousness of the results of their retaliatory attack. If we are protected, or think we are protected, by a shelter program, we are more likely to attack. Thus, shelter opponents

argue, shelters may save some lives, but at the cost of making nuclear war more likely.

The other aspect of the desirability of a shelter program is its social and economic effects. The economic effects involve the choice of priorities—the shelter program will compete for funds, materials, manpower, and talent with other possible governmental or private expenditures. Which of these is most desirable? Will school shelter construction result in less funds for other educational expenditures? If so, is this a necessary protection for our children, and therefore preferable to, say, higher salaries for teachers?

The social effects of a shelter program include questions as to whether such preparations for war make our population more militaristic, and what would be the psychological effects of shelter drills on children. One undeniably beneficial result of the recent shelter consciousness has been to make a larger part of the population more aware of the effects of nuclear war. Are they counter-balanced by those who have been convinced that a nuclear war is not such a bad thing after all, if one had adequate shelter protection?

This, then, is the nature of the shelter controversy. One of the results of the President's speech was the publication of a number of private fallout shelter survival manuals to supplement the official government handbooks. Unfortunately for their publishers, the public interest which provided their market seemed to fade at about the same time as the manuals were published.

Three of these manuals are under review here. Rogers Cannell (1962) and Mel Mawrence (1961) have written semi-technical manuals, while Pat Frank (1962) has written a breezy and sometimes flip-pant essay on survival. All three assume the desirability of shelters, either ignoring the arguments and questions raised by the shelter opponents, or dismissing them lightly.

There are occasional technical disagreements between the authors; for example, Mr. Mawrence speaks of the need for air filters, which Mr. Cannell dismisses as unnecessary. These, however, are minor disagreements. They are all agreed on the necessity and desirability of shelters. The books, then, are not discussions of the issues for the questioning, but rather handbooks for the convinced.

Mr. Mawrence is by far the most evangelical in tone of the three, and promises the most. His book begins with an introduction by Rogers Cannell, in which Mr. Cannell urges political action on behalf of a federal shelter program. Mr. Mawrence then goes on to criticize our national leaders for helping to perpetuate the "myths" of attack without warning, of total above-ground destruction, of the non-existence of blast protection, and of an intolerable life in the post-attack world. It is possible, he says, to live within three miles of a 100-megaton bomb, with proper preparation.

He explicitly assumes, however, the use of smaller weapons in a counterforce attack, of which the great majority of the public will have warning of at least hours, if not days. The warning will come from the enemy's inability to conceal its preparations for attack and from the fact that it cannot hit all targets at once. "The most hair-raising predictions of death based on our present lack of civil preparedness for nuclear war range from 40 to 50 per cent of the population. . . . But the RAND Corporation estimates that with proper preparation this country could hold the death rate in a nuclear war to between one per cent and 11 per cent of the population" (Mawrence, 1961, p. 12). He does not mention the basis for either of these estimates.

Mr. Mawrence's book was written at a time when federal civil defense strategy emphasized the family fallout shelter. He does the same, constantly stressing the indi-

vidual's responsibility to protect *himself*. If separated from one's family at the time of the attack, one should ignore them and concentrate on saving one's self: "If you have built and stocked a shelter and briefed your family beforehand, you can assume they are safe either at school or at home. *Their future well-being depends, to a large extent on your saving yourself*" (Mawrence, 1961, p. 34, emphasis in the original). Despite this emphasis on individual protection, however, Mr. Mawrence interestingly enough says that, if the attack comes, the individual should overcrowd his shelter with unprepared neighbors, so as to keep alive as many as possible. "Of course, at all costs, you must prevent such overcrowding that no one can survive for lack of air. But don't be afraid to stretch your facilities. One of the reasons you want to survive is to teach your children a set of values" (pp. 73-4). Mr. Mawrence apparently sees no contradiction between this and his earlier description of "life itself as the ultimate goal" (p. 13).

In keeping with the theme of individual protection, Mr. Mawrence provides detailed tables indicating the results of various types and sizes of atomic blasts. Thus, the individual can decide for himself how much protection he is likely to need. Also provided are lists of the names and addresses of shelter equipment manufacturers. In addition, Mr. Mawrence discusses the design and cost of various types of shelters, and provides instructions for preparing for an attack, for living in a shelter, and for ultimate survival.

Rogers Cannell is director of the Emergency Planning Research Center of the Stanford Research Institute. *Live*, his "handbook of survival in nuclear attack," (Cannell, 1962) is based on a survival pamphlet he prepared for the staff of the Institute. It is attractively illustrated with imaginative line drawings and provides more detailed blueprints for building a variety of shelters than

does Mr. Mawrence's book. Mr. Cannell's cost estimates are lower than those of Mr. Mawrence for identical shelters, although Mr. Mawrence (in keeping with one of his themes) is more optimistic about their blast protection possibilities. Mr. Cannell also includes "quick-fix" shelters which can be built with an hour's warning time, if the materials are readily at hand. The length of time that one could stay in these shelters is questionable; they include sandbags piled on top of and around a table, with the shelter occupant in the space under the table, and a three-foot high concrete block shelter for two. Many parts of Mr. Cannell's handbook either closely parallel or exactly duplicate Mr. Mawrence's language (e.g., compare Cannell, pp. 91, 102-3, 105-6, and 97-100, with Mawrence, pp. 65, 92, 93-5, 96-9, respectively).

Mr. Cannell explicitly assumes a counterforce strike, with strategic industry and cities secondary and tertiary targets. His estimates of effects assume surface bursts, with less blast and fire hazard, but more fallout. His discussion is in terms of a five megaton blast, and he concludes that firestorms are unlikely; to reduce hazards from fire, he recommends sealing the shelter for several hours after the attack, although many of the shelters which he describes are not capable of being sealed. He assumes little warning time for those in the target area, but more extensive warning for others. "Less than five per cent of the U.S. would be affected by blast by any attack in this decade and for the next few years the odds are that fallout is your primary hazard. . . . If every home had a shelter such as the ones illustrated in this book, there would be virtually no deaths from fallout. . . ." (Cannell, 1962, ii). On the strategic effects of shelters, Cannell has this to say: "Protective measures actually reduce the likelihood of attack. A country is less likely to be attacked if it can survive. An

unprotected population is always subject to an aggressor's blackmail" (vii). The post-attack world would be worth living for, if we are prepared. "More material goods will be available to our people after the attack than exist in any other nation in the world today. . . . And most important, democratic values can endure hardship. The environment would be as safe after attack as the world most of us entered at birth. The evidence is that we could rebuild our nation if we have the will" (ii). Some of his charts are not explicit about the assumptions on which they are based, but he generally makes his assumptions clear, even though he does not point out their significance.

Mr. Cannell suggests that blast shelters "be considered" within twenty miles of likely military targets and in large cities. However, his handbook is concerned essentially with fallout shelters. He feels that group shelters are preferable because of lower cost and reduced necessity for self-reliance. One of the more interesting parts of this manual is his discussion of the Stanford Research Institute's group shelter for its employees, their families, and nearby physicians invited so as to provide medical care. He discusses the planning and equipment of the shelter, including the necessity for short-wave equipment because the lack of protection for Conelrad stations, he assumes, will result in their failure to operate.

Mr. Cannell does not consider the psychological aspects of shelter living or of a shelter-oriented society. His section on first aid does not discuss radiation sickness. His acknowledgements are for the most part to persons who have been active shelter advocates. He ends with the statement: "If nuclear bombs fell on the United States, the American way of life would not have to come to an end. . . . This conclusion is based on three general findings. First, fallout shelters can be extremely effective in saving the lives of tens

of millions of Americans—in saving all of those who are not in immediate target areas, in fact. Second, those saved by these shelters could get through the hazardous period immediately after the attack if food stocks were properly distributed before the bombs fell. . . . Third, resources for rebuilding after an attack would at present survive better than people. . . . This is not to say, of course, that life would be comfortable or even pleasant following nuclear holocaust. But the American heritage has survived the terrors of the frontier and the battle ground. It could do so again” (Cannell, 1962, p. 126).

Mr. Frank has previously written three novels dealing with the onset or aftermath of nuclear war. As might therefore be expected, his present book is much less a manual than the other two, and more a general discussion of civil defense. Mr. Frank belies his book's title in that he doesn't really answer “why” and is often quite flippant, *viz.* his discussion of decontaminating farm land: “The problem of every acre, as of every person, will be different. Consult your county agent, if he is still around, and you still have a county.” He raises some questions that the other two authors ignore, or treat lightly, such as the likelihood of radio station personnel and others staying on their jobs to give warning. Of the three authors, only he talks at any length about arming one's shelter to fight off marauders, although his fear of looters would seem to be exaggerated in view of the comparatively small amount of looting that disaster research would lead one to expect. He also discusses many aspects of the post-attack situation that are discussed by the other authors. He, for example, takes issue with the federal government's suggestion that families be prepared to feed themselves for four weeks until distribution facilities are reestablished: “Instead of four weeks, the truth is four months. Or it could be four years. If you have ever

walked the streets of a great city between midnight and dawn, and watched the endless stream of trucks bringing in a single day's supply of groceries, you have a little comprehension of the food transport problem” (Frank, 1962, p. 119). Mr. Mawrence, in contrast, completely accepts the four-week estimate, and unequivocally states: “Not more than two weeks after attack, community authorities will begin distribution of food and medicine from local supplies” (Mawrence, 1961, p. 90). “About four weeks after attack, Federal authorities will begin supplying communities from national and regional stockpiles” (Mawrence, 1961, p. 103).

At the same time, Mr. Frank's book has numerous contradictions and inconsistencies. He early says that “scientists differ violently on almost every aspect of the damages of H-bomb war and protection against it” (Frank, 1962, p. 36). Yet, he almost never discusses these differences and the basis for them. Rather, he recites certain estimated effects in much the same authoritative way as do the other authors, touching on the basis for his estimates, but never making them clear. He speaks at one point about the precautions the United States is taking, which can be relied upon to prevent accidental war; yet, at another point, he mentions “Murphy's law—any trouble that can happen, will” (p. 45). He relies on a counterforce attack, yet at one point discusses the attacks on large cities which he says are planned by the Russians.

Perhaps of most interest to students of military strategy is his comment that “I can think of only one way in which a holocaust could be triggered by intent—a deliberate decision from the Kremlin.” He goes on to point out that “Soviet marshals have been toying with the theory of what they call ‘pre-emptive war’ for some time” (Frank, p. 44).

In short, if you want a discussion of the pros and cons of civil defense, none of these

books is for you, as you might have suspected. If you want blueprints and plans for shelters, try either the Mawrence or the Cannell books. You might, however, save some money by getting the official government manuals which contain similar information and are available free of charge.

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