

PSYCHOLOGICAL EFFECTS OF ATOMIC BOMBING

14 May 1954

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COLONEL NORMAN: Admiral Hague, distinguished guests, gentlemen of the college: It has been said that people fear those things which they don't understand or comprehend. Of the many effects of atomic bombing of United States cities, few, if any, are more difficult to assess than the psychological effects. Assuming our ground zero and the size of the explosive force, and with some knowledge of the physical structures and the terrain, we can do a pretty good job of assessing physical destruction; we have more or less useful yardsticks. But to assess the psychological effects of atomic bombing, to assess the state of the morale of the population following such attacks, we just haven't the yardsticks, unless our speaker has brought some along with him this morning.

I am not going to put our speaker on the spot and say that he has that hitherto undiscovered yardstick with him, but I am sure he has some very worth-while information as it relates to assessing the psychological effects of atomic bombing to share with us.

Dr. Janis, I am pleased to welcome you to the Industrial College.

DR. JANIS: Thank you very much, sir.

Gentlemen, today I am going to discuss the general topic of psychological effects of bombing disasters from a special standpoint--a standpoint that I hope will prove to be relevant to the needs of your planning program. The general question which I shall attempt to answer is the following one: In what ways, if any, do the psychological effects on the population need to be taken into account in planning that is designed to cope with possible enemy A-bomb and H-bomb attacks against this country? Perhaps the import of this question will become clearer if I put it this way: Why not assume that only a limited set of essentially military problems need to be considered, namely, the active and passive defense measures that are necessary to give maximum physical protection to personnel and property? Why should we concern ourselves with the way people think, feel, and behave in large-scale bombing disasters?

I first began to look over the available evidence bearing on this question a little over five years ago, and at that time I thought that

I had a fairly good idea as to what the main answer would prove to be. I thought that it would be pretty much represented by the single word "panic." I had shared the popular view, which has been repeatedly emphasized in both professional and journalistic discussions of civil defense. In brief, I had thought that any discussion of the psychological aspects of bombing must begin and end with the problem of mass panic.

Well, I came to realize that I was only half right--that the problem of panic is perhaps a good way to begin the discussion, but it would be quite wrong to allow the discussion to end with that topic. What I mean is this: The possibility of panic is certainly to be considered, but it would be a serious mistake to assume that this is the major psychological problem. And, it would be a mistake, I now believe, to orient national defense plans primarily in the direction of setting up police operations and other safeguards that would be needed if we were to assume that mass panic will become a widespread reaction in the event of an all-out war.

The more I examined the existing evidence, the more apparent it became that there are other psychological problems of quite a different nature which loom much larger than the problem of panic--problems which require quite different kinds of plans and policies than those which would be appropriate for the control of panic.

And so, what I shall attempt to do first this morning is to give a realistic context for assessing the problem of panic. Then I shall focus mainly on a major set of psychological problems which appear to be more important. There is no well-established name for this second set of problems. For the moment I choose to call it the problem of "excessive absenteeism." I use this term in a rather broad sense which I shall try to make clear later on.

Turning first to "panic," however, we must recognize that the meaning of the term "panic" requires a bit of semantical discussion because it is an extremely ambiguous concept. Actually, the word has been used in so many different ways that its meaning has become vague. Often it is employed merely as a dramatic eyecatching term to refer to any kind of behavior that occurs when people feel afraid or worried. For example, the reactions following the "Invasion from Mars" radio program, which are commonly referred to as "panic," consisted mainly of the following:

Many people, having tuned in during the middle of Orson Welles' radio program, heard newscasts and announcements to the effect that some sort of invasion had occurred and that evacuation was necessary.

They had no way of knowing at that moment that this was merely a dramatization which was being put on in a highly realistic manner. Many of the people who tuned in on the middle of the program immediately felt anxious, notified others in their vicinity, phoned members of their families, and in some cases went so far as to carry out the official-sounding order to evacuate.

Evidently, there were relatively few in the radio audience whose behavior could be characterized as manifestly irrational or socially dangerous. For most participants, the so-called panic consisted of nothing more than reacting to a false emergency warning in a manner which, by and large, would have been appropriate for a genuine emergency warning. They simply made the mistake of not checking on the authenticity of the emergency warnings. That kind of mistake could cause plenty of trouble if it were to occur in a wartime emergency--but not the kind of trouble that one expects when one has an image of wild, excited maniacs stampeding in headlong flight. And yet this is the image that the word panic usually brings to mind--a wildly excited crowd behaving in an impulsive, completely disorganized fashion, each person abandoning all social values in a desperate effort to save himself.

In order to think about it concretely and objectively, it is necessary to define "panic" in an operational way. For this purpose it is desirable to confine the term to highly emotional behavior which is excited by the presence of an immediate severe threat, and which results in increasing the danger for oneself and for others rather than in reducing it.

This way of defining panic takes account of the negative connotation that the term usually carries. Thus, we avoid referring to all instances of excited behavior as panic since much of it, such as rapid flight from raging fires or from radiation-contaminated areas, may well result in reducing the danger.

With this definition in mind, what does the evidence show as to the actual occurrence of panic among civilians in wartime and peacetime disasters?

Some years ago, at the request of The Rand Corporation, which was operating under a research contract with the United States Air Force, I was asked to examine and to try to piece together the existing psychological evidence from World War II. This evidence included information from interviews of hundreds of Japanese people who lived through the A-bomb attacks in Hiroshima and Nagasaki. It also included a multitude

of case-study reports and statistical data bearing on psychological reactions to conventional bombing in the cities of England, Germany, and Japan. Now, some of the main conclusions that seem to be warranted by the findings, the documentation for which can be found in my book entitled "Air War and Emotional Stress," are as follows:

1. A substantial proportion of the survivors reacted automatically to the brilliant flash of the A-bomb as a danger signal, even though they knew nothing about the existence of atomic weapons at that time. Some who were not located near ground zero took prompt action--such as falling to a prone position--which minimized exposure to the blast and to the secondary heat waves. In many other cases, however, the opportunity to minimize the danger was missed because the individual remained fixed or because the action which was taken proved to be inappropriate.

2. Acute feelings of fear occurred among a very high percentage of the survivors during the crisis phase of the atomic disasters. At least in a small percentage of cases, the emotional excitement reached such a high level that there was temporary inefficiency, defective judgment, and some thoughtless, impulsive actions. In some cases, the emotional disturbance took the form mainly of severe depressive reactions. In general, however, the acute emotional symptoms among the A-bombed survivors do not differ from those observed among the British, Germans, and Japanese subjected to exceptionally severe air attacks with conventional bombs.

3. There was at least one incident of overt collective panic behavior among a sizable crowd of survivors in Hiroshima. In addition, at least a small proportion of terrified survivors in Hiroshima and Nagasaki behaved impulsively, and perhaps irrationally, for a brief period of time. But the meager, fragmentary evidence available on overt behavior does not provide substantial support for claims that overt panic, disorganized activity, or antisocial behavior were typical or occurred on a mass scale during the two A-bomb disasters.

In general, so far as the evidence goes, it indicates that panic occurred among only a tiny fraction of the population that was exposed to wartime disaster conditions. Moreover, when panic reactions did occur, they apparently were not very serious in that they were rapidly terminated and did not have any particularly devastating consequences. The one panic in Hiroshima that I referred to evidently did result in the loss of some lives, but I would estimate that it was a negligible percentage of the total number of lives lost in that disaster.

During the past two years I had the opportunity of keeping up with the research now going on in the field of peacetime disasters in the United States as a member of the Committee on Disaster Studies. This particular committee was established by the National Research Council at the request of the Surgeon General of the Army, Navy, and Air Force and also at the request of the Federal Civil Defense Agency. Recently a few of us were asked to serve on a subcommittee that would prepare a general statement on the problem of panic to be issued to interested agencies within the United States Government. So I have been working collaboratively on this matter with several other members of our committee--men from the fields of psychiatry, sociology, and psychology. We haven't yet finished our report and so I cannot cite it as an official document of the National Research Council, but I would like to give you the gist of the material and to quote some of the statements that we put in the first draft of the report.

We begin by taking account of the current hunches and guesses about the possibility of local and national panic in this country which have received wide publicity, particularly in recent discussions of the atomic bomb. Most of the forecasts, as you know, assume that an enemy nation can easily create panic and mass hysteria through the use of atomic or thermonuclear weapons--or even through the mere threat of using such weapons. Perhaps the most extreme example of this assumption is to be found in the magazine articles by Philip Wylie--and in his best-selling novel, "Tomorrow." The main theme in such speculations seems to be essentially this: The enormous loss of life and property created by atomic bombings will be only a small part of the damage we shall suffer; the most horrible thing of all will be the devastating disorganization and paralysis of our surviving population who will become an uncontrollable horde of stampeding animals or raving maniacs, completely in the throes of panic and mass hysteria.

When we attempted to assess the facts which could give rise to such vivid and dramatic predictions, we soon found that the evidence fell far short of minimal scientific standards--to put it mildly. The instances of authenticated mass panic known to have occurred in the last 50 years have been very few in number and have been very restricted in their effect. Although the world has been almost continuously at war during this time, it is a significant and somewhat astonishing fact that there have been few instances of panic directly connected with enemy attack on a civilian population. Moreover, we rarely find any instances of collective panic when we examine carefully the observations of the behavior

of Americans who have been victims of peacetime disasters, such as industrial explosions, conflagrations, earthquakes, tornadoes, and so on.

We do find numerous instances of individual panic reactions. For instance, in a Minnesota plant explosion a few years ago, the workers heard the explosion and then saw the flames and smoke coming up the elevator shaft. Some of them began running away from the elevator shaft without having stopped to think whether that was the best way to try to escape. In the gas explosion that rocked Brighton, New York, in 1951--just on the outskirts of Rochester--some of the people who heard and felt the nearby explosion showed the same kind of impulsive flight behavior. One woman became so excited that she fled from her home, leaving her child behind. She said, "The first thing I thought of was a bomb, naturally, and I ran out. I just felt it was a bomb and I ran."

So we do have plenty of instances of this sort among individuals who are suddenly confronted with extreme danger. But it is equally important to note that these individual panic states are usually of short duration and of very limited scope. For instance, the woman very soon remembered the child she had forgotten and went back and took the child out of the house.

Studies of terrified people who have been stunned by an overwhelming disaster indicate that excited and irrational behavior can usually be prevented or quickly brought to a stop if effective leadership and realistic information is provided. As a matter of fact, the people who are most frightened and most upset very soon become extremely docile and usually can easily be induced to conform to the rules and regulations of the local authorities. Sometimes their docility is so extreme that it constitutes a special type of problem.

The logical conclusion from the evidence is that mass panic is a rare event which arises only under highly specialized circumstances. We do know something about the conditions which give rise to panic behavior--though not as much as we would like. There are three main factors which are characteristic of the panic-producing situation--this was true certainly with respect to the panic at Hiroshima referred to earlier--they are:

1. There must be a perceived threat. The threat may be physical, or psychological, or a combination of both, and is usually regarded as being so imminent that there is no time to do anything except to try to escape.

2. There is partial or complete breakdown of the escape route. The escape route becomes blocked off, overlooked, or jammed.

3. There is a front to rear communication failure. In instances where people are trampled to death, as in the Cocoanut Grove fire in Boston, this is usually the single, most important factor. The false assumption that the exit is still open leads the people at the rear of the mass to exert strong pressure to advance toward it. It is this pressure from the rear that causes the frequently fatal injury to those at the front who become smothered, crushed, or trampled.

These relatively simple panic-producing conditions are obviously subject to administrative modification or control. Planning for defense against A-bomb and H-bomb disaster would include taking account of the fact that the conditions which create panic are mainly likely to occur after a major disaster has struck, at a time when thousands of injured, confused, stunned survivors are seeking to escape from fires and from other sources of danger in their immediate area. Here the major problem is posed by the likelihood that large numbers of entrapped people will converge upon limited escape routes.

Advance planning to prevent panic requires establishing a number of alternative escape routes from each target area. Of even greater importance is continual reconnaissance of the flow of people and traffic. This should preferably take place through some method of inspection by air in order to obtain maximum scanning of the affected area, and of the condition of the various "escape hatches." Information thus obtained and instructions based upon it should then be communicated over the length and breadth of the traffic stream. So another element in advance planning is to provide for some effective means of communication that will be available in an emergency situation. If accurate information and sound instructions are relayed to disaster survivors, the possibility of panic will be markedly reduced, perhaps to the point where it no longer becomes a serious problem.

Let us now examine the second major set of problems, to which I apply the term "excessive absenteeism." Following every disaster, we find five main types of emotional reaction that seriously affect the way in which people perform on both emergency tasks and their regular jobs--they are:

1. Traumatic neurosis.
2. Emotional shock.

3. Apathy and hopelessness.
4. Docility and constriction.
5. Apprehensive, self-protective attitudes toward self and family.

All five of these have this in common: They are psychological reactions which result in a marked reduction in job efficiency and in job output. Each of them can produce actual physical absenteeism--that is, the person is physically capable of doing a job but simply does not show up. He does not engage in any form of constructive activity at a time when there is an acute need for activity on the part of every able-bodied person. Second, these reactions can result in psychological absenteeism--that is, the person may turn up for a job assignment, he may report for work, but the quality and quantity of his performance is such that he can be regarded only as a fraction of a man.

Consider for a moment the situation in any large industrial plant, where emergency operations need to be carried out to save furnaces and to protect valuable machinery from unnecessary damage during a period when the plant cannot operate in a normal fashion. The ineptness of an apathetic or distracted person whose mind is not really focusing on what he is doing can have very serious consequences. In an emergency situation, when a man is really only one-half present, the mistakes he makes and the things that he leaves undone can have adverse effects that extend far beyond the mere loss of one-half of the man's normal output.

Now, let's examine each of these five reactions briefly. I shall attempt to summarize the main findings regarding these reactions that come from observation of both wartime and peacetime disasters. Instead of going into the details of the evidence, I shall try to convey the importance of each factor by extrapolating to the situation of a potential A-bomb or H-bomb attack.

Traumatic neurosis refers to a set of severe symptoms such as persistent anxiety attack, sleeplessness, and extreme irritability. Those symptoms are of an incapacitating nature and may persist for weeks and months, depending partly upon whether adequate psychiatric aid is available for the individual. In the case of emotional shock, the person is upset, jittery or stunned temporarily, but recovers gradually, anywhere from a few hours after the disaster to several weeks after. The rate of recovery in both types of cases can definitely be speeded up by adequate

handling. That is, the amount of absenteeism from these two causes among survivors in an A-bombed city as of two days, a week, or a month after the explosion will depend on what kind of care and aid these cases are given.

The need for advance planning on this matter is not simply limited to the goal of minimizing the loss of man-hours of productive labor. Those who do not recover spontaneously from the harrowing, traumatic experiences of the disaster will not only be incapable of productive work, but, in addition, will generally have a demoralizing effect upon others in the community. And so, at the very least, advance planning needs to take account of the necessity for separating out these people so they cannot have this kind of adverse effect on those around them.

Of course, there is little likelihood that skilled psychiatric aid will be available for all of the temporarily maladjusted persons, but it should be possible to speed recovery by adopting sound policies of rehabilitation. For example, it might be possible to plan for setting up temporary rest camps in which a therapeutic atmosphere is maintained so that those who are too disturbed to return to productive activity will have an opportunity to recuperate. In addition, it is important to develop effective psychiatric first-aid techniques and rapid therapy methods for handling large numbers of traumatized survivors.

I understand that the American Psychiatric Association has recently prepared a detailed pamphlet outlining methods of psychiatric first aid and is planning to encourage various types of nonprofessional people to obtain the appropriate type of training.

Apathy is perhaps the commonest of all emotional reactions among disaster victims during the period immediately after the most extreme and obvious dangers have subsided. A small number of individuals remain in a dazed, almost sleep-walking state for several weeks. A much larger number simply become lethargic, pessimistic, lacking the initiative to carry out any work activity. These reactions, too, can be terminated more or less rapidly, depending upon whether the community can offer stimulating leadership, encouragement, and the basic necessities of life--adequate shelter, food, and clothing. These simple things are crucial for restoring the motivation of apathetic disaster victims to become active members of the community again. Essentially, they have a kind of depressive attitude: "What's the use of bothering about anything anymore?"

Even those who do not become markedly depressed are apt to be unusually docile and lacking in initiative. They simply wait around for someone to tell them what to do. Their interests are narrow or constricted and they lack motivation to exert any energy. If you tell them to do something, they do it in a very perfunctory sort of way. They fail to seek out for themselves the information they need in order to perform their jobs correctly. They will often blindly follow whatever directives they are given. If a manager or top official makes a mistake in adapting some emergency policy--which, by the way, is a problem that looms about as large as that of absenteeism--the employees cannot be counted on to give him the sort of feedback that would normally enable them to correct the situation.

The last form of absenteeism I would like to talk about is one that is a bit more complicated in nature than the others. Some components of it are similar to the apprehensive, self-protective attitudes we sometimes see in combat ground troops: "I've been through hell and I don't intend to be a sucker again;" "I am going to choose my assignments after this; I have a right to pick and choose now because I have done my share." That kind of attitude is, fortunately, not too widespread but it is certainly one that we frequently encounter among men who have been, say, kept in the line a little too long.

Part of the reaction is a hostile, aggressive one, of feeling justified in watching out for number one--for me and mine. Part of it is sensitivity to danger and overcautiousness, based on bitter experience. For instance, several days after the gas explosion disaster in Brighton, New York, a number of people reported doing things like this: "Every time we smell a little smoke or we think we smell a little gas, or hear any kind of unusual noises--everyday things that we never even noticed before--we're all ready to get up and run out of the house because everybody is on the alert now."

Well, this combined set of self-protective attitudes is not very conducive to cooperative efforts and to good work performances, especially if it becomes a strategic necessity to have large numbers of industrial workers remain on the job in areas that may be subjected to radiation hazards after an atomic attack or in areas on the periphery where there is high danger of a repeat performance.

To a very large extent, the rapidity with which such reactions subside will be determined by the effectiveness of organized aid and relief measures following the disaster. If these measures are not well

planned or if they cannot be put into operation, an extremely unfavorable situation is to be expected.

Following the emergency evacuation of a bombed city, homeless survivors would be widely scattered over a large region. There would be frantic competition for the scarce quantities of food, water, and medical supplies available. Many groups of survivors who received no help from people in outlying communities might become extremely hostile and feel justified in attempting to obtain shelter and supplies by force if necessary. Thousands of half-starved people would be wandering about for a long period, seeking their lost families and friends.

Obviously, if this type of social disorganization occurs following an atomic disaster, the worst consequences of demoralization can be expected. On the other hand if the essential needs of the survivors are well provided for, and if there is sound community leadership, there is every reason to expect that within a short period the vast majority will willingly participate in reconstruction work or in other forms of productive labor and make a fairly adequate adjustment to the deprivational situation that faces them.

In conclusion, I would like to correct a possible false impression that might have been created by focusing exclusively on the unfavorable psychological reactions of disaster victims. Let us consider what happened in a tornado disaster that struck one of our cities during the past year. This particular tornado was very much like a surprise A-bomb attack, in that the disaster struck without warning and was of such magnitude that over 1,000 people were injured and over 10,000 people were made homeless. In a way it furnished a kind of preview of what would happen in a suburban community that was perhaps a mile or so away from ground zero in an A-bomb attack.

Well, in that tornado disaster there were plenty of instances of each one of the five forms of absenteeism that I have described. But that is only a part of the overall picture. I would like to read to you a brief account of the main reactions of the population, as described by a team of research workers who studied this disaster:

"Most of the survivors in the main path of the tornado were dazed. It took a number of minutes for them to realize the seriousness of the damage. Each was appalled by the magnitude of destruction and numbed to some extent by the realization of his own personal losses. But almost all of these people made whatever efforts they

could to extricate themselves from the ruins of damaged buildings. Most survivors then looked for other members of their families who had been nearby when the storm struck. Those who were able to do so attempted to extricate injured people from the rubble. They fell to work on the nearest problem that presented itself.

"The people living in slightly damaged or undamaged areas near the path of the tornado tell stories which have a fairly uniform pattern. Most of them checked their immediate surroundings and, finding that damage was minor, turned to more seriously damaged areas and acted as volunteers to remove the injured; a flood of volunteers streamed into the damaged areas. Thousands of volunteers gave first aid, cleared the roads of rubble, and despite all sorts of administrative confusion, spontaneously managed to provide aid and relief to the injured and homeless."

Here we have an example of what I would consider the most astonishing fact that emerges from the study of both wartime and civilian disasters in this country and abroad: namely, that despite all the adverse circumstances and the emotional upset created by a disaster, a very large proportion of the affected population spontaneously engages in adaptive, problem-solving behavior which enables them to cope fairly effectively with the crisis. Observers of disaster situations are repeatedly impressed with the resourcefulness of both the individual and the social organizations within the community.

This does not mean that conflict, confusion, and all varieties of excessive absenteeism do not occur among the survivors of a disaster. But usually the various unfavorable reactions that I have been speaking about take place in a special context of incomplete information, of inexperienced leadership, of poor planning, and of jammed communication circuits.

There are plenty of problems connected with attempting to plan for the natural human resources of this country to function at an optimal level in the event of a national emergency. There is, nevertheless, good reason to expect that these problems can be surmounted by effective planning.

COLONEL NORMAN: Gentlemen, Dr. Janis is now ready for your questions.

QUESTION: I noticed that you didn't deal with the anger reaction in the public after an atomic attack. Would you care to explore

the possible effect of that reaction of anger in the public as it might be reflected against Government leadership, the military, or other elements trying to effect leadership over things after the attack occurred?

DR. JANIS: We have some idea of the nature of anger reaction, particularly from the studies conducted by the Strategic Bombing Survey at the end of World War II. Their findings are confirmed by various independent studies made in England during the blitz. They show that there was a good deal of ill feeling generated by bombing attacks. It was somewhat surprising, but very little of the resentment was directed against the enemy. Most of the ill feeling was directed toward the local community leaders and the national Government. It is understandable psychologically how this comes about. There isn't much that British people could do about protesting against the Nazis, but there is always the opportunity to raise h--- with the local warden, and to do something in line with one's feeling that the mayor is incompetent. Especially during the postdisaster period, when they felt that proper measures of aid and rehabilitation weren't forthcoming, hostility was a prominent attitude.

But we must take account of the overt behavior manifestations of these various aggressive reactions. The fact is that the hostile feelings, the negative attitudes and bitter criticisms that were so widespread among the bombed populations in World War II, did not seem to materialize into any kind of overt protest; the total incidence of any kind of rioting, of street demonstrations, or of overt noncooperative actions was very, very small.

Now many speculations have been put forth as to why this was so. It is quite understandable that in Nazi Germany and in Japan the police controls that were exercised were such as to prevent this kind of thing from occurring. But that factor alone does not provide a completely satisfactory explanation even in totalitarian countries because there were cities like Hamburg where, after the bombings, police controls were temporarily in a very weak state; yet, the population didn't riot or show any overt protests. In England, where wartime controls were not as drastic as in totalitarian countries, there was an equally small incidence of overt protests despite the enormous amount of verbal complaint.

Gripping was widespread in every bombed city but it seemed to be pretty much limited to that. So we have come to believe that hostility

reactions were not very serious, except insofar as they contributed to the absenteeism kind of reaction. The reaction of anger against the community--the idea that "I have a right to look out for myself; you have no right to make demands on me," certainly leads to failure to carry out job assignments. But so far as open revolt and noncooperation in adhering to Government orders is concerned, that does not seem likely to be a very widespread or typical reaction.

QUESTION: I really have two questions. One is similar to what you have been talking about. When city A is bombed, what about the people of city B psychologically, when they face the question, "Am I next?" The other question concerns psychological absenteeism and physical absenteeism, the five classes of people. You said the majority of the evidence showed that people in bombed areas did something productive, had a good reaction. Could you tell us what percentage of the people suffered from the five types of reaction? Put it in a sort of mathematical perspective.

DR. JANIS: I wish we could. Unfortunately, this particular field of social science has not reached the stage where we can really give any kind of quantitative answer. The best we can do is to use certain broad quantitative terms--that is, to describe what the majority action is likely to be and what is likely to characterize the reaction of a sizable minority and of a small minority.

Essentially, what I tried to do in the material I presented was to concentrate on those reactions of a problem nature which are likely to be the most frequent ones, and those which are likely to characterize a sizable minority of the population.

There are some very complicated problems involved when one tries to estimate how many people are productive and how many become absentees. In this connection, I should like to correct one possible misconception. The constructive activity I spoke of is sometimes engaged in by people who temporarily suffer from one or another of the absenteeism reactions. For instance, if a person becomes apathetic, it doesn't mean he is totally apathetic toward everything. If someone suffers from any one of the absenteeism reactions, it doesn't mean that he is a total loss to the community. Much of the activity is quite constructive but not all that it should be. That is why I used the concept of half a man. Most people try to perform the community jobs that have to be done, but sometimes their efforts are inefficient or not entirely constructive.

I am afraid I can't give a specific answer to your question about statistics. You will find some relevant figures on the percentage of people in Germany and Japan who exhibited various kinds of reactions to bombing in the published reports issued by the U. S. Strategic Bombing Survey. But these figures give only a part of the story and, moreover, one cannot take such figures at face value. For instance, we don't know exactly what the margin of error is. Also, it is to be expected that the actual percentage of people who become apathetic or unproductive or who show any other sort of reactions depend upon the specific nature of the disaster and the way the community is organized to cope with the disaster.

In general I think we have to realize that it is extremely difficult to obtain reliable quantitative estimates on reactions to disaster. For the present we have to be content with obtaining information about the conditions under which each of the major types of reaction is likely to increase or decrease.

With respect to your first question, you are quite right, I did not discuss the situation before disaster has struck. It is very difficult to predict what kind of reactions will occur at the time when people know that other cities have been bombed and that their own city might be next. For one thing those predictions cannot be made in a vacuum with respect to knowing exactly what the plans are for coping with the threat of repeated attacks.

When it comes to forecasting how people will react after disaster strikes, we feel quite justified in extrapolating from observations made in other countries exposed to bombing and from observations of peacetime disasters that have occurred in the United States. But we cannot feel as secure about trying to extrapolate to the threat situations that may exist prior to an actual attack. Nevertheless, I would like to mention a few reactions that seem to be fairly common ones in threat situations and that may help to give at least a partial answer to the question.

First of all, prior to World War II, there was another myth that I would put in the same category as the collective panic myth--the myth that the most harrowing kind of situation a population can go through is one of suspense, the situation of knowing that you are likely to be subjected to an all-out attack and that you just have to wait for it to come. Especially in England, there was a great deal of concern about the way the population would react to the mere threat of a massive air assault.

What the evidence indicates is that this kind of threat elicited a lot of excitement which mainly took the form of a lot of talk. It seems that people don't tolerate the situation of suspense for very long. Their interest in the threat begins to lag. They find all kinds of ways of defending themselves against thinking about the danger. That was the characteristic pattern at the beginning of the air blitz against England. There is also some evidence that this pattern occurred in Germany and Japan. On the day the news came out that another city had been hit, there was lots of excitement--but it was an excitement that people didn't go anywhere with except to neighbors, to talk about it. Then the excitement would subside and most people would adopt the attitude, "Yes, it might happen here but we have protection," or "even if it does happen, I will not be affected." These beliefs were sometimes bolstered by unrealistic ideas about the strength of the defending forces and by beliefs to the effect that "I have a charmed life; it can't happen to me."

This is the same kind of reaction you get among men going on their first combat mission. It is a way of defending oneself against anxiety until the last possible moment, until one can no longer escape the reality. As a matter of fact, because of these psychological reactions we may find a very serious problem will be stirring up people to take the kind of protective action they ought to take in advance to prepare for a possible destructive blow.

The degree to which people are stimulated to take sensible, protective action depends partly on how the information about the impending attack comes through, what kind of rumors exist, and how rumors are corrected. Suppose for instance, people hear that A-bomb and H-bomb attacks have wiped out dozens of our cities. If all the communications about this disastrous situation are to the effect that there's no sense trying to do anything about it, people are apt to adopt a fatalistic attitude that leads them to become apathetic and inactive.

On the other hand if people are given information that stimulates them to take prompt action, there is likely to be a problem in connection with spontaneous evacuation. Many people, including industrial workers who are expected to remain on their jobs as long as possible, may feel like sitting ducks and will want to get away from the target area as rapidly as possible.

One important factor in connection with these problems is planning for emergency evacuation on the assumption that there will be an hour or so of warning time so that the target area can be evacuated sufficiently

to get most people far from the region of danger. Whether this is a realistic assumption for the kind of weapons that are going to be used remains an open question. But if an emergency evacuation plan can be worked out, then it would be possible to prevent the confusion and disruption that would be created by unplanned evacuation. People need to know what their battle stations are, when they are supposed to evacuate, where they are supposed to go, and so on.

If an evacuation plan is not feasible, the important factor will be the shelters. If the shelters are perceived to be really effective, people will feel relatively secure and will make use of them. But if the shelters do not afford much protection, people will come to know it and will try to escape from the hazards in some other way. The question of how people will behave at a time when they are faced with the threat of an imminent A-bomb attack will depend on the adequacy of the shelters, the emergency evacuation program, and the warning system. Those are the factors, I think, which are going to be critical. If those needs can be adequately met in advance, I think a chaotic kind of situation can be avoided.

COLONEL NORMAN: Dr. Janis, the number of hands that we can't recognize because of time is certainly indicative that you have created a tremendous amount of interest. On behalf of the college, I thank you very much for your very thought-provoking and interesting lecture and discussion with us this morning.

(23 June 1954--750)S/ibc