. . . . . AN AMERICAN JOURNAL OF CIVIL DEFENSE

SURVIVE

VOL. 2 NO. 2 MARCH - APRIL 1969

See: "Fire and Nuclear Weapons" – Page 14

CIVIL DEFENSE FORUM

OAK RIDGE CIVIL DEFENSE SOCIETY

ASSOCIATION FOR COMMUNITY-WIDE PROTECTION FROM NUCLEAR ATTACK

Also in this issue:

Civil Defense in the Soviet Union - by Joanne Levey

NORAD: Nuclear Fortress

"The need for an effective Civil Defense is surely beyond dispute. . .No city, no family nor any honorable man or woman can repudiate this duty. . ."

– Sir Winston Churchill

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READER COMMENT:

Interlaken, New York

To the Editor of Survive

Dear Sir:

May I make a few comments to the article titled: Evacuation and Dispersal in the USSR? (*Survive,* November-December 1968)

According to this article, which was originally published in the Journal of the Soviet Army, the Russians have set up an elaborate organization which is supposed to secure the orderly evacuation of their cities in case of an emergency. But an organization of such magnitude can be successful only if there is ample time – at least many days – before the emergency becomes acute. In case of a sudden attack nobody would go home to get the 100 lbs. of belongings, go to the prescribed gathering station, stand in line, register, etc. etc.; but everyone would run for a shelter or wherever he could.

With the fact that the Russians have found it necessary to prepare such plans they are giving us an authentic proof of their intention to strike first, if it will suit them. Only in this case will this plan be applicable.

The Russians are perfectly convinced that the American atomic policy is firmly based on the "second strike" principle, and so if they don't have any aggressive intentions, there is no need for such an, evidently costly, organization.

We should, therefore, give very serious consideration to the significance of this unintentional disclosure of their future intentions. As it seems to me, we should not give the Russians, by renouncing any possibility for a "first-strike" on our part, a free ticket and even encouragement for riskless troublemaking for us and for different parts of the world.

Unless there will be a decisive action toward organized insurance of peace, we should adjust our military and civil defenses in such a way that we will be able to oppose our adversaries with a good prospect for success.

The old Latin saying: *Si vis pacem, para bellum* should be translated under present international conditions for: If you want peace, be prepared for opposing all kinds of warlike actions even under the guise of coexistance.

Sincerely,

Ernest Lantos

Among Survive Writers

Joanne Levey

In searching for a qualified writer to do an authentic study on Soviet Civil Defense, *Survive* found its solution at the Oak Ridge National Laboratory. Mrs. Joanne Levey of the Oak Ridge Civil Defense Research Project has been under contract with OCD and the Atomic Energy Commission for the past two years to help organize civil defense research literature and information retrieval. From this will develop a computerized national civil defense information center. As an avid student of Soviet literature for over twenty years, Mrs. Levey found Soviet civil defense publications a fertile source of information for American civil defense analysts. In her article, "Civil Defense in the Soviet Union" appearing on page 2, she shares her perceptions with *Survive* readers.

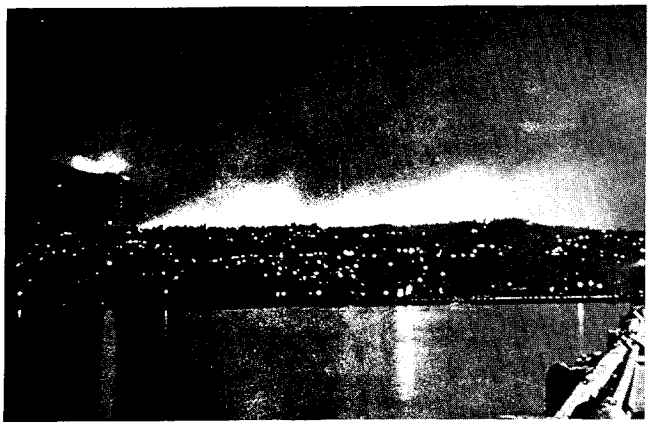
West German 1968 CD Expenditures Zoom

An item in the *Suddeutsche Zeitung* reveals a burgeoning civil defense program for last year. It reads:

"During 1968 expenditures on civil defense by the federal government amounted to 433 million marks, the Interior Ministry reports, noting that civil defense organizations accounted for most of this sum."

433 million marks is 108¼ million dollars – almost twice the United States civil defense budget. The population of West Germany is one-third that of the United States.

COVER PICTURE



Here a forest fire rages through the night behind a populated California hillside. "Fire and Nuclear Attack" on page 14 of this issue describes similar fires caused by conventional and nuclear bombings.

SURVIVE

...AN AMERICAN JOURNAL OF CIVIL DEFENSE

Sponsored by

The Civil Defense Forum
The Oak Ridge Civil Defense Society
The Association for Community-Wide Protection from Nuclear Attack

Survive is published bi-monthly by The Association for Community-Wide Protection from Nuclear Attack. Address: *Survive,* Post Office Box 910, Starke, Florida 32091. Subscription: $3.00 per year.

Survive presents authentic information relating to civil defense – to the survival of free government, the United States, and its people in the nuclear age. Its aim is public education in this field and service as a forum.

Authors are encouraged to submit manuscripts for consideration by the editorial board for publication. Articles (preferably illustrated) should be 1,000 to 2,500 words in length, slanted to the non-technical reader, and oriented toward the civil defense field. Views expressed in contributions to *Survive* are those of the authors and do not necessarily reflect *Survive* policy.

Survive is printed by Char-Ko Specialist, Inc., 1518 Gary Street, Jacksonville, Florida 32207.

CIVIL DEFENSE IN THE SOVIET UNION

An American specialist in Russian civil defense – and Russian culture – unveils the intricate pattern of a highly systematized Soviet survival plan. Mrs. Levey's exhaustive research includes first-hand study and analysis of over 60 Russian publications.

Why Study Soviet Civil Defense?

The Soviet Union does not rely wholly on its ballistic missiles to deter enemy attack or to defend against such attack should it occur. Thus, in addition to ballistic missiles, it has two other arms of defense: an antimissile defense system and a civil defense program.

United States opponents of a solid civil defense claim that such a program would be provocative and ineffective. Evidently, the responsible circles of the Soviet Union do not think so. Let us see, therefore, just how effective the Soviet civil defense program is. And why is it important for us to know this? If Soviet military strategists could protect their urban population from the effects of nuclear weapons either through substantial urban blast shelters or preattack evacuation to rural areas plus fallout protection on arrival, they would have a decided strategic advantage over an enemy that could not do likewise. The Soviets, for obvious reasons, do not emphasize this in their unclassified literature. But they do indeed make other claims for the strategic importance of civil defense. Civil defense makes it possible:

(1) To mobilize the armed forces during the initial period of war;

(2) To support troops with equipment and weapons as the war runs its course; and

(3) To protect and repair industrial, transport, and communication facilities.

Unclassified Soviet military literature abounds in articles on all areas of civil defense; thus, to read a fair amount of this material is one way of getting at least a layman's sense of the Soviet civil defense program–its scope, its quality, and its emphasis. Such a reading, admittedly, does not reveal the exact number of Soviet shelters or their effectiveness. Yet even in areas such as these, certain clear-cut inferences may be drawn. For example, the abundance and extent of shelters is inferred when numerous articles instruct people to go to the nearest shelter on receipt of the "Air Alert" signal and indicate further that such shelters exist everywhere that people live and work so that when they hear the signal, they may take cover quickly.

Aims of the Soviet Civil Defense Program: An Overall View

Civil defense in the Soviet Union encompasses–at least in some degree–all aspects of protecting the population from the consequences of enemy attack and involves every citizen from top party officials to the man-in-the-street. The program is endorsed by both the Central Committee of the Communist Party and the Ministry of Defense and is implemented through an enormous organization which reaches down into every region, city, village, collective farm, and industrial establishment. While the Soviet civil defense program represents a massive effort, it is not a crash program; its strength is cumulative, lying in a steady attempt to expand and upgrade every facet since its inception, in its present form, in 1961.

The basic objectives of the program are:

(1) To safeguard the population from nuclear, chemical, and bacteriological weapons;

(2) To protect industrial installations and maintain production;

(3) To protect agricultural resources; and

(4) To undertake massive rescue and reclamation operations to liquidate the effects of an attack as quickly and effectively as possible.

More specifically, protection of the population is achieved by:

(1) Building shelters;

(2) Providing the population with individual means of protection (such as gas masks and protective clothing);

(3) Evacuating the population in the event of escalating crisis;

(4) Training the population to make use of the available means of protection;

(5) Warning the population and the national economic establishment of attack;

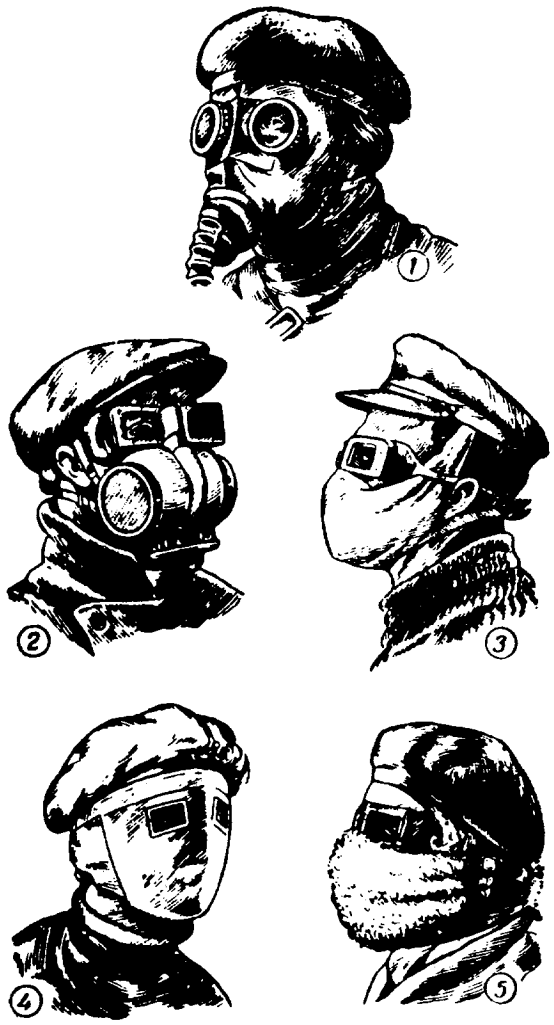
(6) Conducting rescue and repair operations in stricken areas;

(7) Rendering medical aid to the injured; and

(8) Preventing panic.

Civil Defense–No Matter of Controversy

There is little question about the importance of civil defense in the Soviet Union. "Defense of the Socialist Motherland" includes both active and passive defense and is regarded as everybody's business–party and government, armed forces and civilians. It is not a matter for debate, partly because the Soviet system of totalitarianism discourages controversy, and also because many Russians living today have had firsthand experience with enemy attack on the homeland during World War II. People who have pulled incendiary bombs out by the fins and seen Red Square on fire and the Kremlin ablaze "have been there before." They need no convincing.



Individual protective equipment illustrated in a Russian Civil Defense publication. Russian Key reads: 1 – Gas Mask; 2 – Respirator; 3 – Dustproof Fabric Mask; 4 – Cotton and Gauze Mask; 5 – Towel (Fabric Mask).

A Trained Population

Civil defense training in the Soviet Union is compulsory and universal. Everyone is exposed to it–school children in grades five through nine, both in classrooms and in summer camps, pre-draft-age men in military-sport camps and in educational institutions, industrial workers at their places of employment, and members of collective farms. There is multiple exposure in that civil defense is publicized at movies, on radio and television, and in magazines, newspapers, and factory publications. Civil defense courses are tailored to the needs and ability of the trainees. Farm children, for instance, are taught how to protect cattle, forage, food and water supplies as well as themselves. Factory employees learn rescue and reclamation operations and ways of reducing the vulnerability of their shops. All Russians are trained to identify and make the appropriate response to the seven warning signals (Air Alert, All Clear from Air Alert, Threat of Radioactive Contamination, Radioactive Contamination, Chemical Attack, Bacteriological Contamination, and Threat of Flooding). They are also instructed on how to respond to surprise attack and to the preattack government order to evacuate their cities. Instructions are specific and concrete. For example, if at home when the "Air Alert" is given, citizens are told to get together individual protective equipment (gas mask or dust mask, raincoat, and rubber boots), close the windows, turn off heat, gas, stoves, and lights; take the previously prepared supply of food, water, and personal documents, and head quickly for the nearest shelter, warning their neighbors (who may not have heard the signal) on their way out.

Realistic Exercises

Soviet civil defense training for male youth and adults puts emphasis on going into disaster areas almost immediately after attack to perform rescue and reclamation operations. They are taught to use cranes, bulldozers, and other heavy equipment to dig people out of caved-in shelters, to build emergency passageways in buried shelters, to extinguish fires, to administer first aid, and to evacuate the injured. Training exercises for these complicated operations are realistic with actual protective clothing and heavy equipment being used. Realism extends in other program areas to the simulation of chemical warfare agents from inexpensive materials available in any drugstore and to the practice evacuation of the mothers and newly delivered babies of a maternity home to a kindergarten 37 kilometers away.

Detailed Plans

Besides being realistic, civil defense plans are thoroughgoing. Soviet military literature describes, for example, plans to protect the employees of one large industrial

enterprise having 57 buildings. The plant director has arranged personally with the help of his civil defense staff to settle all plant personnel in the country if international crisis should develop. Plans have been made to billet these workers and their families in homes in the surrounding villages, to increase the food supply of the stores at which they would get groceries, to provide water for the additional members of the communities (in one village an artesian well was dug on the spot when it was apparent that water was in short supply), to arrange for the post office to deliver, on short notice, mail and pensions to the evacuated population at their new addresses, and to stock shelters in the villages to accommodate the additional shelterees.

Evacuation

Preattack evacuation of large segments of the urban population to rural areas under certain conditions of crisis escalation is an important plank in the Soviet civil defense platform. Industrial workers in cities are to remain on the job and take refuge in special shelters at or near their place of work; but nonessential workers, school and preschool children, and retired people are to be transported to the country. Upon arrival, the evacuees are to assist their rural hosts in constructing hasty fallout shelters on sites that have already been surveyed for this purpose. Plans for evacuation are detailed, including, for example, time schedules for departure to collecting points; the presence of a doctor or nurse on each evacuation train (or with every convoy of trucks); instructions on what each family should bring (depending on climate and season); and special evacuation passes with a stub and a detachable slip for each person. Experience dates from World War II, when over ten million people and over 1,300 basic industries were successfully transferred from vulnerable areas to the interior. Since then, Soviet transport capability has moved rapidly forward. The system of railroads alone—the backbone of the USSR transport system—adds about 600 miles of new line and converts 1,600 miles of existing line to electric motive power per year. Motor transport and maritime transport have also made great strides, and the Moscow subway system, initiated in 1932, has grown in the past 35 years to 75 miles with more than 80 stations erected. Subways now also exist in Leningrad, Kiev, Tbilsisi, and Baku. The daily number of subway passengers in Moscow is over 4,000,000. In addition to having the experience and capability for evacuation, the Soviets have developed a new civil defense transport service, operated by a specialized staff.

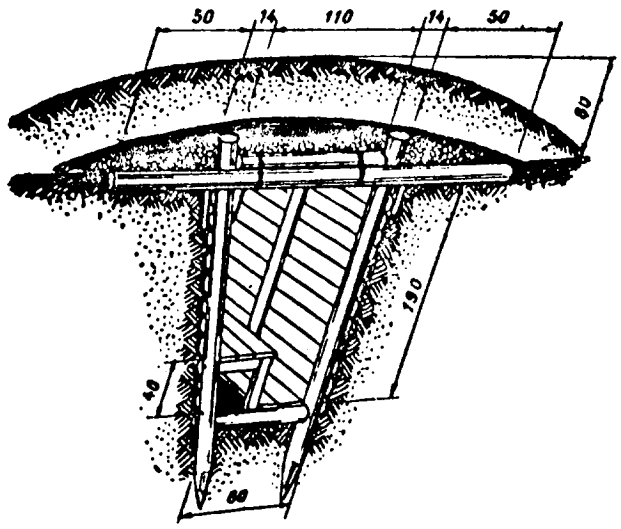
Rural Civil Defense

At the other end of the evacuation plan for urban dwellers is the reception and protection of these evacuees in the country. The Soviet rural civil defense program has this and three other important aims:

(1) Furnishing manpower for rescue and emergency restoration work in the city;

(2) Assuring the output of agriculture in wartime; and

(3) Protecting people, livestock, food, fodder, and water supplies against radiological, chemical, and bacteriological weapons.



Expedient Shelter is emphasized for rural population and evacuees. Here a Soviet drawing shows a cross section of a slit trench (dimensions are in centimeters).

Emphasis is on protection against fallout in the country. Thus, there are explicit manuals with detail instructions, both on erecting hasty shelters out of materials on hand and on converting vegetable bins to fallout shelters. There are also instructions for providing fallout protection for livestock both by adapting farm buildings as shelters and by driving the cattle into forests and other sheltered areas away from the probable direction of the advancing radioactive cloud. Builders of individual houses are encouraged to construct simple "cover" in basements with bricks allotted to them for this purpose.

Shelters

Soviet authorities emphasize the importance of shelters as the *most effective* means of defense against nuclear weapons. There are numerous kinds of shelters, such as subways, which are equipped with heavy blast doors; substantial, isolated, single-purpose shelters (largely for key government and party personnel); and basement shelters in apartment houses and public buildings. Certain mines have been designated for use as shelters.

Large public shelters are equipped with heating systems and with filter-ventilation units that keep out radioactive dust and chemical and bacteriological agents. In addition to water, food, toilets, medical chests, and bunks, they contain crowbars, picks, and shovels for breaking holes in the walls, if necessary, and for dismantling obstructions. There is a box of clay for sealing cracks. There are burlap,

rags, and binding wire for wrapping patches on damaged air ducts. Standard equipment also includes radiation measurement instruments and protective clothing to enable selected personnel to make radiation reconnaissance missions and to conduct the urgent operations outside the shelter. Portable radios are on hand to establish communications with local civil defense headquarters and with rescue units.

Detailed articles with tables and diagrams appear in the Soviet literature on adapting building basements as "cover". "Cover," unlike shelter, does not protect against chemical and bacteriological weapons. Householders are expected to bring along their own food, water, and first aid kits. Ceilings in conventional building basements support only their useful loads and can therefore withstand only the load from very weak shock waves. Thus, in setting up cover in existing basements, ceilings are reinforced to withstand loads from moderately strong shock waves and possible building cave-ins.

Soviet shelters are provided with emergency exits for getting out of the shelters in the event that the main entrance is blocked by building fragments. The emergency exit consists of a covered underground passage protected against debris of falling buildings. This exit is located at a distance of at least half the height of the building and is at least three meters away from each of the surrounding buildings.

Shelter control units, composed of five to seven men, are selected from among the workers in every industrial establishment and institution and from the technical and services staff of the housing operations office for apartment buildings. This shelter crew must have intimate knowledge of the layout of the shelter, the emergency exit, and the location of water, sewer, telephone and power lines. The unit commander, in particular, must be thoroughly familiar with the emergency power system and the filter-ventilation system, for he will be the one to make such possibly crucial decisions as when to turn on the ventilation system. Should he delay too long, the temperature and humidity in the shelter could rise to dangerous heights, whereas were he to act too soon, the filters could become clogged up with dust from the surrounding destroyed buildings. He must also decide when it is the best time to send out a reconnaissance crew and when it is safe for everybody to vacate the shelter.

Protection Against Chemical and Bacteriological Agents

If attacked, the Soviets expect nuclear, chemical, and bacteriological weapons to be used. For this reason equal billing is given to protection against all three types of weapons, and Soviet citizens are instructed to use such individual means of protection as gas masks, rubber boots, raincoats, and rubberized gloves. There are also explanations of the procedures in an area which is put under quarantine because of bacteriological attack. The civil defense medical service, for example, introduces prophylactic measures for the entire territory, giving injections to all residents. Clothing, household articles, and residential premises are disinfected; anyone showing symptoms of illness is immediately isolated; and those caring for the sick are taught to exercise precautions both on entering and leaving the sick room.

Protection of Industrial Operations

To secure the survivability of industrial installations, Soviet planners urge dispersion of industry, duplication of production, missile defense, and the removal, in some cases, of the most essential industrial plants to the interior at the beginning of war or when war threatens. Industrial vulnerability is also reduced by strengthening the plant buildings and their contents against possible damage from nuclear weapons. Thus, we come across recommendations in Soviet literature that civil defense chiefs at various installations organize qualified groups of people to determine the vulnerability of basic units, assemblies, and equipment on the basis of prognosticated damage assessment and to consider ways to reduce it. One way is to "slant" new construction and reconstruction toward this end.

Among the most readable articles in the unclassified Soviet military literature are those describing how individual directors of large enterprises secure their establishments. An example is the account of Gregory Petrovich Garmash, assistant director and designated civil defense chief of a large Kharkov tractor plant. Comrade Garmash, the article points out, knows that "the important thing is to prevent panic." "Experience suggests," he remarks, "better to see once than to hear about ten times." With this practical guidepost in mind, Comrade Garmash organizes civil defense teams in each shop and section—four decontamination teams from the test experiment shops, six medical detachments from the fuel equipment shop, and a team for technical emergency work from the repair machine shop. In all, ten civil defense services are established at the tractor plant. Elaborate plant exercises are organized in which 800 people participate. That Comrade Garmash means business in shown by the following quotation. "Several times Comrade Garmash told the chief of the Housing Service Section: 'Put the shelters in order.' The chief promised. But he did not act. Then he was punished by the director. Now the shelters are in order." There are many similar accounts of civil-defense-conscious plant directors in Soviet literature.

Prevention of Panic

One fundamental and publicly underscored goal of the Soviet civil defense program is the prevention of panic. Leading Soviet strategists like V. D. Sokolovsky recognize that the explosion of nuclear weapons could easily cause an outbreak of panic. Should this occur, uncontrolled streams of refugees could disrupt the deployment and mobilization of the armed forces, and, further, the effectiveness of rendering aid to the civilian population itself would be seriously hampered. *(continued on page 12)*

F — A NEW TECHNIQUE

— Robert Baffin

Knowledge of patterns of radiation intensity immediately after a nuclear attack is vital for a number of reasons. These reasons include the following:

1. Shelter-stay requirements;
2. Determination of probable accumulated radiation doses,
3. Emergency operations of rescue personnel;
4. Possible ground traffic routes;
5. Planning for utilization of crop and livestock resources;
6. Decontamination possibilities; and
7. Planning for recovery operations.

This knowledge will require an all-out radiological monitoring effort with as little delay as possible. This monitoring is preferably done by means of surface monitoring because surface monitoring will pinpoint details in pattern variation and is relatively accurate.

Surface monitoring, however, is slow. And high radiation levels may not permit it. The alternative is aerial monitoring. This can be done quickly but with much less detail and accuracy. It gives excellent broad-brush reports of radiation patterns. The agency looked to by civil defense to fulfill this mission is the Civil Air Patrol with its several thousand planes. Most of these planes are capable of cruising at speeds below 100 mph for sustained periods of low-altitude flying.

The aerial monitoring survey meter is the CD V-781. Its maximum reading is 10 roentgens per hour which means that within this limitation and under emergency conditions an aircraft can undertake several hours of monitoring without incapacitating overexposures to pilot and crew.

An airborne plane has a protection factor based on its altitude and a small correction for the materials in the plane itself. The following are estimated protection factors calculated from information contained in the OCD "Handbook for Aerial Radiological Monitors."

Altitude of Aircraft	Protection Factor Within Aircraft	Maximum Ground Radiation Intensities Measurable by Survey Meter CD V-781
100 Ft.	3	30 R/Hr.
200 Ft.	5	50 R/Hr.
300 Ft.	7	70 R/Hr.
500 Ft.	15	150 R/Hr.
1,000 Ft.	36	360 R/Hr.
2,000 Ft.	250	2,500 R/Hr.
3,000 Ft.	1,500	15,000 R/Hr.

The OCD handbook recommends a survey altitude of 300 to 500 feet. However, it may be seen by the chart that the capacity of the CD V-781 survey meter is exceeded at the lower altitudes by comparatively moderate radiation intensities. While it is true that major portions of the fallout field would show these moderate intensities it is also true that much higher readings would be common. The recommended flight altitude of 300 to 500 feet would then have to be substantially increased, perhaps to 1,000 or even 2,000 feet. Small-scale irregularities of fallout distribution are sacrificed, but this sacrifice does not detract from the value of an air survey.

The concept of aerial radiological monitoring is in its infancy, and further developments will be forthcoming. Field testing by the Civil Air Patrol will undoubtedly bring about notable improvements. It is obvious, however, that aerial monitoring can provide disaster recovery directors with reliable and useable information of overall radiation intensity patterns within a space of a few hours. This will permit a prompt evaluation of the fallout situation and more effective planning to contend with it. ■

SO BE IT!

- by Don F. Guier

"If the administration decides, as a result of the current review, to go ahead with the planned deployment of the $5.5 billion Sentinel system, it could face its first major defeat in the Senate."

– The New York Times, February 25, 1969

In the Senate hearings on the treaty which is supposed to stop the spread of nuclear weapons to nations not already armed with them, Senator J. William Fulbright indicated he feels this pact may well prevent any further development of a U.S. defense system against missile attacks. In the Senate and elsewhere, the proposed Sentinel antiballistic missile deployment has raised objections and questions as to cost, effectiveness, technical feasibility and the effect on arms limitation negotiations.

Despite this opposition, the Nixon team has been nearly unanimous in expressing the view that some ABM system will be required. The constitutional mandate to provide for the common defense weighs heavily on men who bear the awesome responsibility of assuring that our nation can and will survive.

The question under review by Defense Secretary Melvin R. Laird's Pentagon staff has been how such a system will be deployed. Point defenses near our great cities have drawn emotional criticism as being both inviting targets and dangerous neighbors. Some favor concentrating the defenses around our minuteman sites and a few strategic targets only. Results of the review ordered by the new Secretary are expected sometime in March.

But one thing has been clear since the first serious consideration of antiballistic missile deployment: the need to consider complementary passive defense systems.

Of course, our minuteman sites are already hardened, so that no further passive defense measures would be needed to complement an ABM system designed to protect only these targets. Similarly, any ABM deployment designed to protect cities would be a poor investment without shelter.

It has long been accepted that an enemy frustrated by ABM defenses around a city could still wreak havoc with upwind ground bursts, if there were no fallout shelter system provided.

As the Soviet offensive missile arsenal grew, making it impossible to assure interception of *all* incoming warheads, the case for complementary shelter became clear.

Blast shelter of varying "hardness" and fallout-only shelter, depending on proximity to targets, would provide enough protection to assure the overall life-saving effectiveness of the defenses. ABM's, in turn, would be able to intercept enough incoming weapons to permit shelters to protect most of the people. And, in addition, it is probable (based on the U. S. reaction to the Soviet ABM system) that our ABM's would force the Soviets to substitute a multitude of low-yield warheads for the extremely high-yield weapons. Blast protection against these high-yield weapons would be difficult if not impossible.

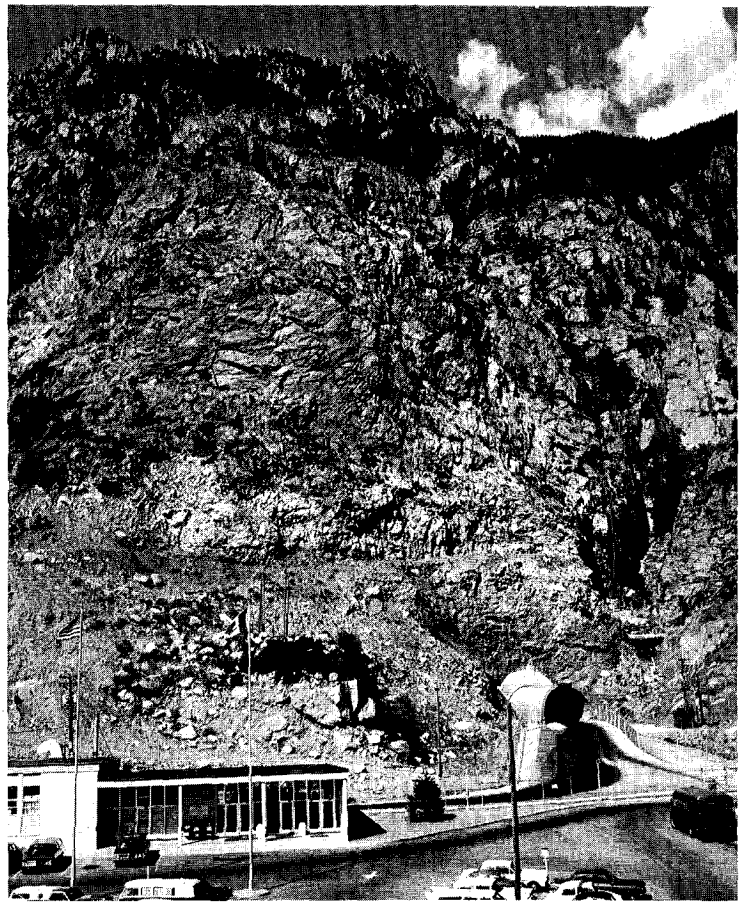
We now have the capability of providing a national fallout shelter system, at a cost well below early predictions. Best possible shelter may never be feasible for all, but we can supplement first-class protection with best available shelter, at very low cost. Such a program could save millions of lives.

Just as a "thin" ABM system would create the framework and technology for a more complete system later, our fallout shelter system is giving us the organization, the public understanding, and much of the shelter technology for a more adequate shelter program. In time, blast shelters will very likely become a part of all urban planning. Today they are routine only in Switzerland, Sweden and a few other places.

In planning our nation's defensive system, we must select the best possible mix of active and passive defenses. The new administration has accelerated an ongoing study of the effectiveness of various mixes, presumably in order to consider the results in the current ABM policy review.

If the needs and costs are made crystal clear, the public will accept the idea of strategic defenses, both active and passive, as readily as we now accept the need for strategic retaliatory forces. There is ample evidence, in fact, that the public is already ahead of the government in the acceptance of civil defense programs.

This widespread, long-standing, community-oriented acceptance of civil defense may turn out to be the key factor in national approval of ABM defenses. ■



NORAD:

The nerve center of today's North American Air Defense Command (NORAD) is hollowed out of Cheyenne Mountain in Colorado. Flags of the United States and Canada represent the dual headquarters. Inside the tube-like entrance, framed in solid rock, and 17-foot-thick concrete collars, are two 30-ton steel blast doors. Fifty feet apart, they form a large admission chamber for entering and exiting traffic.

One massive door is always closed in order to guarantee maximum protection against shock. Inside these doors a 29-foot wide tunnel penetrates 1,400 feet to the heart of the mountain. Military security guards maintain a tight, 24-hour vigil.

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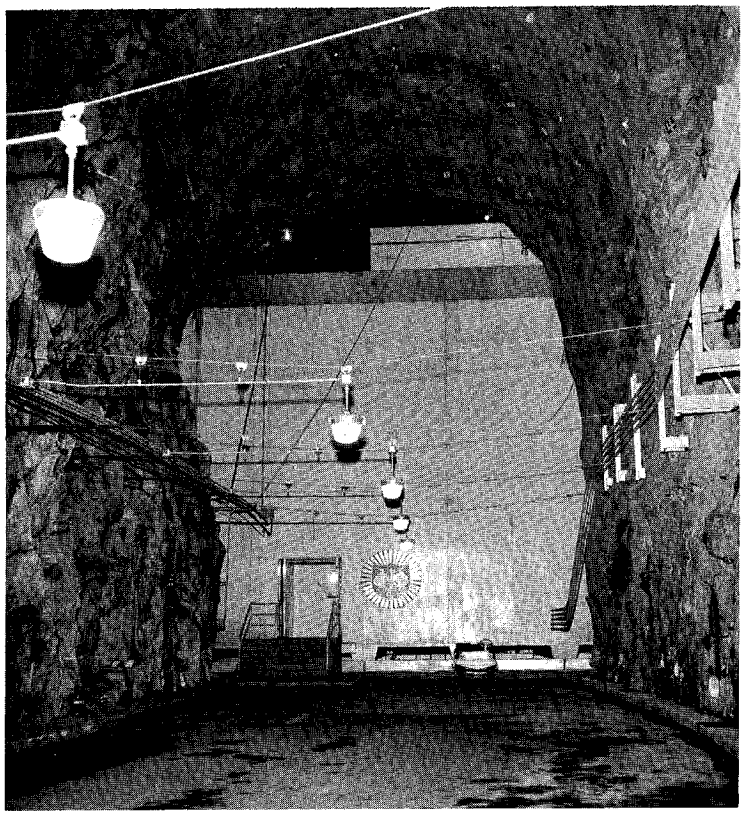
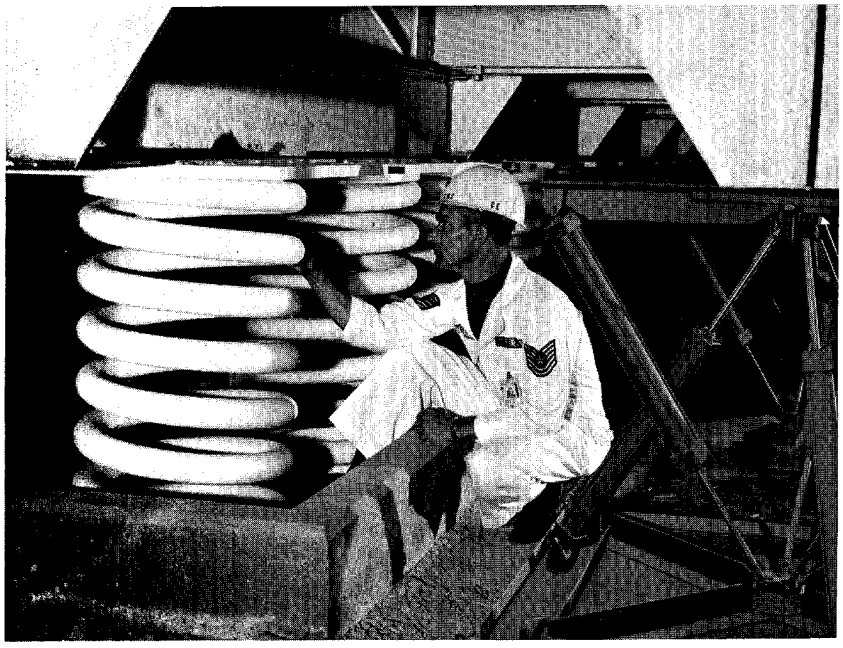
NUCLEAR FORTRESS



Here a 4½ acre subterranean city boasts a population of 900 military specialists. They occupy eleven windowless steel buildings. Eight of them are three stories high, and they provide slightly over 200,000 square feet of floor space. Equipment is shock-mounted. Flexible vestibules connect the buildings, and the buildings themselves are mounted on over 900 one-ton steel springs.



Hydraulic shock absorbers complement the springs. Blast valves guard air intake and exhaust lines, as well as water and sewage pipes. Power to operate the headquarters comes from six generators (956 KW each) that could service a city of 35,000. Supplies within Cheyenne Mountain are adequate to keep the entire operation going for more than a month's time.

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CD SPOTLIGHT

AIA Journal Promotes Shelter Slanting

The key to obtaining shelter in new construction is in preliminary design slanting. It is therefore significant that the editors of the *AIA Journal,* the official publication of the American Institute of Architects, chose to feature a three-part series entitled "Radiation Shielding: An Architectural Primer" in their last three issues of 1968.

Recognizing at the outset that the danger of nuclear warfare is shockingly real, author Robert J. Patton also faces squarely its complexity. "How well our country could survive such an attack and restore technical, political, and social resources," he writes, "depends heavily on how we prepare to meet this potential danger."

Patton confines his study largely to protection in urban areas and their mushrooming development. "Our country is moving toward the largest rebuilding of urban communities in our history. If radioactive fallout is one of the future possibilities with which we are to deal, total-design concepts for the protection of populations should be incorporated into the master planning process. This spells out the challenge facing those who, through their professional abilities, are best equipped to meet it – architects, planners and engineers."

He emphasizes the role of topography and bodies of water in the reduction of fallout fields, the importance in construction projects of an early approach to design slanting, and the need for the continued functioning of utilities during a nuclear attack emergency. He underlines the fact that community leadership must accept responsibility for seeking solutions to the overall problem and that architects and urban designers must provide the solutions. "The field," he concludes, "is wide open for research and imaginative application."

Patton has followed OCD guidelines in limiting the scope of his three articles to the consideration of fallout radiation. This limitation is understandable. There will, however, be some lifting of eyebrows among those who feel that, as probable target areas subject to blast and thermal radiation, most population centers must plan in terms of blast shelter. This type of emphasis has long been established doctrine in other countries.

Perhaps the *AIA Journal* may continue its successful probing of the question of shelter slanting by playing its light on the more difficult problem of shielding against *all* effects of nuclear weapons. This sequel would be of major help to urban areas.

In any case the fact that the American Institute of Architects has given its members an up-to-date commentary on radiation shielding is a measured step toward a general acceptance of design slanting by the professionals in the architectural field.

"Professional Society for Nuclear Defense" Founded by Shelter Analysts

At a special Purdue University conference of 300 shelter analyst instructors January 20-24, recommendations for the organization of a professional association that would be free to express its opinions on national security bore fruit. The result was the founding of the "Professional Society for Nuclear Defense". Elected to the Board of Control were:

Franklin J. Agardy, San Jose, California
Robert N. Bruce, Jr., New Orleans, Louisiana
Robert F. Davidson, Rolla, Missouri
Raymond R. Fox, Washington, D. C.
Lowell B. Jackson, Madison, Wisconsin
Edward W. Jerger, Notre Dame, Indiana
Emory Johnson, Brookings, South Dakota
Don A. Linger, Albuquerque, New Mexico
Francis X. McKelvey, Bronx, New York
William M. Miller, Seattle, Washington
Clyde W. Nelson, San Diego, California
John A. Samuel, Gainesville, Florida
Elmira S. Smyrl, Bozeman, Montana
Walter F. Spiegel, Jenkintown, Pennsylvania
George K. Wadlin, Orono, Maine

The board promptly determined the purpose of the society: "To advocate the generation and dissemination of information relating to the professional and technological aspects of civil defense. It is dedicated to the survival of free government, the United States, and its people in the nuclear age." The board also appointed pro tempore officers to serve during the initial development period: Lowell B. Jackson, President, of Madison, Wisconsin; Francis X. McKelvey, Secretary, of New York City; and Robert E. Bailey, Treasurer, of West Lafayette, Indiana.

In a special statement prepared for 16,000 shelter analysts plus the 600 college instructors in shelter analysis, President Jackson had this to say:

"On the many occasions over the past half dozen years when the faculty and analysts have met at professional and technical society conferences, scientific and educational seminars, or programs in support of civil defense, the opinion has been frequently expressed that rather than remaining individually impotent in the influence of civil defense policies, perhaps an affiliation of knowledgeable and concerned professionals would serve a useful purpose. The generation and dissemination of pertinent defense information, the exchange of strong viewpoints from a position independent of government policy strictures, the constructive criticism of existing programs, guidance in the development of legislation which affects building design

and community planning – all of these (and more) seemed to be relevant activities for professionals who are fully aware of the implications of the existence of nuclear weapons in a world strained by ideological conflict."

Editor's Note: The charter membership period of the Professional Society for Nuclear Defense will extend to July 1, 1969. Those desiring to affiliate with the Professional Society for Nuclear Defense are being asked to forward basic biographical and professional particulars and a charter membership check for $5 to the treasurer (Professor Robert E. Bailey, 112 Tecumseh Park Court, West Lafayette, Indiana 47906).

Pamphlet Review
Civil Defense -- A Vital Concern to PTA

(MP-53, January 1969)

Published by the National Congress of Parents & Teachers. 30 Pages.

Judged by its presentation, its logic and its conclusions "Civil Defense – A Vital Concern to PTA" is a well-conceived 1969 appeal to the common sense of PTA members. It follows by two and a half years another outstanding school shelter pamphlet, "Current Status of Civil Defense in Schools", which was published by the National Education Association.

The new publication asks the question:

> "Are the children in the American public schools reasonably well protected from the effects of major disasters – natural or man-made?"

And it quotes its answer from the text of the old one:

> "The answer is NO!. . .The picture of school civil defense is a dismal one, even frightening, when one thinks of the millions of children with little or no protection."

It proves its point dramatically with the chart below.

It warns that the entire PTA membership must become alert to the nuclear threat and embark on a meaningful attempt to provide America's 44,000,000 public school population with a degree of safety in disaster situations of all kinds. It observes:

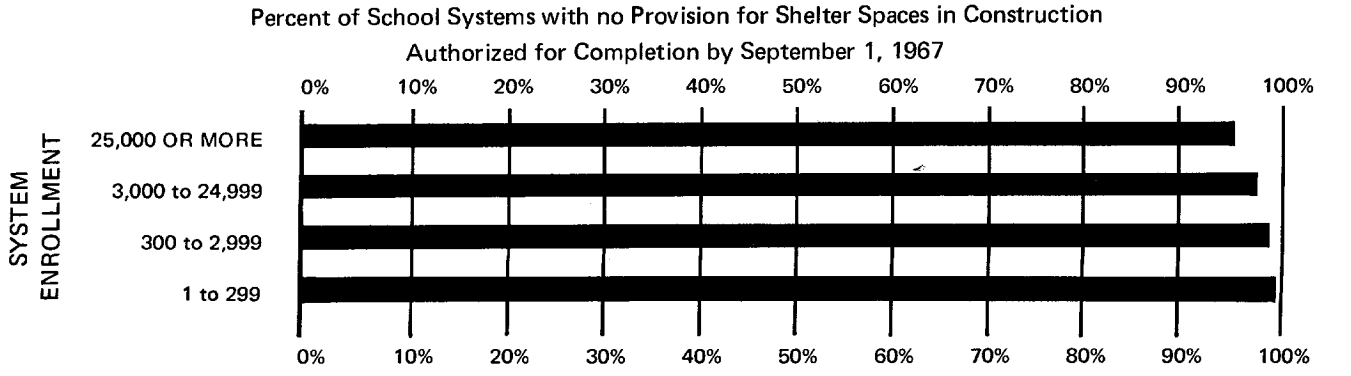
> "The first step the PTA must take in its civil defense program is to develop an awareness of civil defense – 'to know the plans of civil defense agencies.' Members should know what kinds of natural, man-made, and wartime disasters threaten the local community, the schools, and their families, and what are the best means for survival. They should know the programs of civil defense and other agencies that exist to cope with disasters.
>
> "Awareness should create concern. It should prod each member into asking: 'What would happen to America, this community, its homes, our children, to me, if–?' And 'What must I do to improve the situation?' "

Judged by the chill reception which public school administrators and faculty have given previous CD analyses by school planners, "Civil Defense – A Vital Concern to PTA" is apt to fall victim to both emotionalism and studied unconcern. Where it has the good fortune to be evaluated by PTA leaders and planners oriented to a factual approach to school disaster possibilities it will be an invaluable contribution to school safety, survival, and recovery. ■

NUCLEAR NOTES:

Among the 12 recipients of the Medal of Science, the American Government's highest award for distinguished achievement in science, mathematics and engineering for 1968, were Dr. Nathan M. Newmark and Dr. Eugene P. Wigner. Newmark, Head of the Department of Civil Engineering at the University of Illinois, is credited with developing a basic methodology for blast shelter design. Wigner led the research of 62 fellow-scientists and engineers that resulted in the Harbor Report for OCD in 1963. The awards were made by President Lyndon B. Johnson on January 17th at the White House. Newmark's award was in the field of Engineering Sciences, and Wigner's award was in the field of Physical Sciences.

The February issue of *True* features "Nagasaki: The Forgotten Bomb". Author Frank W. Chinnock puts added drama into an already intensely tragic event. In the midst of wholesale death, however, Chinnock tells of many of those who survived the blast, heat and initial radiation and explains the circumstances that permitted survival. It is obvious from the article that, had simple expedient preparations been possible, the number of survivors within the area of destruction would have been much greater.



Civil Defense in the Soviet Union

(continued from page 5)

The most recent effort to promote love of country and loyalty among the young was the passage of the "Law of Universal Military Obligation" in October, 1967, by the Twenty-Third Session of the USSR Supreme Soviet. This law seeks to "achieve a profound understanding of personal responsibility for the Soviet state by future servicemen" (the young people in the new compulsory pre-service training program), by "patriotic indoctrination" and to "strengthen ideological conviction and unflagging loyalty to the motherland." The law is also designed to bring about "a further improvement in the work on military-patriotic education of the Soviet people, and the formation among them of the necessary moral and psychological qualities which permit withstanding, if necessary, the severe tests of war . . ." Leaders like O. V. Tolstikov believe that "civil defense will be much stronger if the morale and political unity of the citizen is strong and the citizens are rallied around the true ideas which can inspire people to heroic deeds and sacrifices."

Training and Inducements

As a result of the new Law of Universal Military Obligation, the Soviet civil defense effort has taken a marked thrust forward during the past year (1967-1968). Basic military training of youth has been introduced in the high schools and the trade schools, as well as at factories, institutions, and collective farms. The instruction includes knowledge of the properties of weapons of mass destruction and methods of protection against them. Compulsory civil defense education has been introduced into the fifth, sixth, and seventh grade classes of the secondary and eight-year schools of general education.

In an article about civil defense training of school children, a Leningrad school was described where instruction included training in the use of small arms, motorcycles, and even parachutes. Other inducements for learning about civil defense include visits to national monuments and shrines and sessions with war heroes and with civilians who participated in the heroic defense of Moscow in World War II. Instructors are told outright to link bravery and heroism not only to the field of battle but also to defending the peaceful population behind the lines–in the rear. It is an interesting sidelight to Soviet pedagogy that while teachers are instructed to capitalize on their pupils propensity for patriotism and to enlist their interest with such glamorous equipment as motorcycles, they are nonetheless cautioned: "It should not be forgotten that studies are work and not fun. Like any labor they require willful physical and mental strain."

In summer camps, where emphasis is on putting into practice what the children learned in the classroom, pennants, citations, and buttons are awarded for excellence in civil defense drills and exercises. The best detachments are singled out for gifts, and there is occasional television coverage of the exercises so that the children can see themselves on the TV screen.

At industrial plants, contests are held among civil defense squadrons with awards for the winners. Distinguished performances in all areas of civil defense are cited in the press. Directors of large industrial establishments, shop heads, instructors, and ordinary factory workers have an equal chance to be named, for example, in the magazine *Military Knowledge.* Conversely, those who flagrantly shirk their civil defense responsibilities may also get to read about themselves. "The Unfortunate Comrade Blinov", was cited in the journal *Military Knowledge* for his lackadaisical attitude toward his civil defense duties. He declined to make use of the special classroom set aside for a civil defense office; he failed to acquire sufficient training equipment and visual aids; and those he did get were not kept in order. Worst of all, the lessons conducted by Comrade Blinov both "in content and in method are not worthy of criticism." Poor Comrade Blinov!

Summary

On the whole, the Soviet civil defense program is comprehensive, well integrated, and substantial. This is not to say that it is above criticism. The Soviets themselves admit the discrepancy between the civil defense blueprint and the current edifice – the plans are well conceived but their implementation imperfect. There are pockets of apathy as well as inefficiency and, in some cases, poor quality of performance.

But Soviet civil defense is impressive. In the last year alone, civil defense planners have introduced:

(1) Compulsory civil defense instruction for school children, youth, and factory workers;

(2) Better training for those who teach them;

(3) More detailed and concrete evacuation plans;

(4) Greater realism and practicality in training scenarios;

(5) An improved communication system; and

(6) Extended radio, television, and newspaper coverage.

A sheltered population, having high morale and well trained in how to make the best use of the warning time at its disposal – be it two minutes, two hours, or two days – is not likely to give way to panic or to give up in resignation. The high state of discipline and morale of survivors would be an extremely important factor in enabling the Soviet Union to withstand the severe hardships of nuclear war and to work toward victory and recovery.

Even more convincing than the assurance of survival to the Russian people is the attractive proposition held out by Kremlin leaders that hard-core civil defense strength on the

home front means much more than realistic survival insurance: it means making nuclear attack on the Soviet Union unattractive, without requisite gain and full of unacceptable risk. It means giving Red diplomats a particularly effective weapon at the conference table. ■

Space does not permit inclusion of bibliography of 63 recent Russian publications and articles. This list may be obtained by sending 50 cents (check, money order, cash or stamps) to Survive, P. O. Box 910, Starke, Florida, 32091.

EDITORIAL

The Pueblo Incident

News items have revealed that the Navy was unable to respond immediately to Pueblo calls for help because "an armed attack on the Pueblo by the North Koreans was not considered as a likely possibility." In other words, the U. S. Navy was unable to foresee adequately the intentions of a hostile state. This is an old story. It was true at Pearl Harbor when, although Japanese planes were detected on radar prior to attack, the U. S. armed forces were unable to respond because a Japanese attack seemed to be only a remote possibility. The American people were even less alert than their armed forces.

These events in our past should motivate us to ask ourselves if we have overlooked some move by a potential enemy that we are not prepared to meet. We do not have to look far to realize that, although the Soviet Union is estimated to have over a thousand H-bomb tipped missiles to launch at the United States, pitifully little has been done to provide the shelters necessary for our people to survive their attack. Surely we have learned by now that we cannot entrust to Russian (or Chinese) "good intentions" the survival of our nation. If we are caught "napping" in this case, it will probably be the last time.

France has a remarkably comprehensive "Thermal and Radioactive Effects" slide rule designed by Omaro for the National Service of Civil Protection. The 5x10½-inch calculator covers a weapons range from 1 kiloton to 500 megatons. Simple and yet detailed, it gives statistics on air, ground and underwater bursts, as well as on bursts which can be classified as in between air and ground.

FIRE AND NUCLEAR WEAPONS

– A Survive Staff Analysis

Exaggerated versions of the danger of fire effects of nuclear weapons have gained favor. Here the disagreeable facts are examined and brought into realistic focus. Included in the authoritative research on fire effects of nuclear weapons upon which this analysis is based is that of Dr. Abraham Broido of the U. S. Forestry Service, to whom Survive *owes special thanks.*

Toward the end of World War II, in 1945, two atomic bombs were dropped on the Japanese cities of Hiroshima and Nagasaki. Although the initial phases of the two explosions were quite similar, there were distinct differences in the damage inflicted on each city. In both cases, the energy of roughly 20,000 tons of exploding TNT was suddenly released in a volume with dimensions of only a few feet. The effect was similar to that of suddenly moving a chunk of the sun from its position 93 million miles away to a point above the city. Immediately a great flood of light and heat radiation poured out. Every object was bathed in an intense glare as though the sun's light had been concentrated on it by an enormous magnifying glass. Wooden walls charred and sometimes burst into flames that quickly died. But dry leaves, paper, rotten wood, and other flammable material burst into flames that did not die. This intense light passed through glass windows, igniting curtains, paper, rugs and furniture coverings. Light colored objects fared better than dark, wool better than cotton, cotton better than rayon, but near the bomb they all ignited. As the heat radiation streamed away from the bomb it spread over a wider area and, in this manner, was "thinned out." The air itself absorbed some of its energy so that less heat was available to ignite objects farther from the bomb. Finally, at a distance of about 2/3 of a mile to one mile, the radiant energy was so degraded that it could no longer ignite flammable materials easily.

In the meantime the hot bomb material, unable to release its vast quantity of energy rapidly enough by radiating, was violently expanding, creating an outwardly progressing crest of air called a shock wave. As this wave passed over lightly constructed homes, the fast moving winds following the shock front ripped them from their foundations, upset stoves, and broke gas and water pipes. More strongly constructed buildings withstood this blast, but their windows and furniture became flying projectiles that still caused major damage. The upset stoves added to ignited material already present, broken gas pipes supplied fuel, and broken water pipes hampered the fire fighting that would take place later. The blast wave weakened as it departed farther from the center of the explosion so that, at distances a little less than one mile, it was no longer able to add to the fire damage.

After the radiation and blast wave had passed, the flames began to spread from their points of ignition. In some cases, however, they ran out of fuel and died. In other cases, they found paper, wood, leaves, or cloth nearby. In some of these latter cases they spread until they joined, and soon whole blocks were aflame.

Here the stories of Hiroshima and Nagasaki begin to differ. The landscape of Nagasaki is chopped up with small hills, often bare on top. These hills provided some shielding from the heat radiation. Fires burned through the valleys but often stopped at the hills. A little over one square mile of the city burned in Nagasaki.

In Hiroshima, however, the terrain is flat. The fire found plenty of combustible material and coalesced until several adjacent blocks were on fire. The heated air now sought to rise as it does up a chimney. The hot air on the outer edge of this great fire mass was quickly replaced by fresh air drawn in from the outside. As the fires increased in intensity, the winds swept inward. About 20 minutes after the explosion, the "fire storm" was fully developed. After a period of 2 to 3 hours, winds reached a maximum velocity of 30 to 40 miles per hour, finally decreasing to light or moderate and becoming variable in direction after six hours. An area of 4.4 square miles was burned out by this fire storm in Hiroshima. Fortunately, the inward direction of the winds helped to prevent the spread of the fire to a larger area.

Fire storms of this nature were not new with the atomic bomb. They had occurred in large forest fires and in previous incendiary raids on German cities and on Tokyo. The Hiroshima storm was not even the biggest. A fire raid on Tokyo on March 9, 1945, for example, resulted in the destruction of 16 square miles compared to the 4.4 in Hiroshima. The dead and injured amounted to more than 80,000 and 100,000 respectively in the Tokyo raid compared to 70,000 and 70,000 respectively from all causes in the Hiroshima raid. The fire storms following incendiary raids on German cities also exceeded the size of that at Hiroshima. There was evidence of wind velocities up to 75 miles per hour on the edge of the fire storm in Leipzig.

All persons caught in a fire storm will not be lost. It is true that persons trapped in the open have little chance to survive, but a little shelter can make a great deal of difference. An example of what shelter can do is found in the fact that 43% of the people in the Nippon building in Hiroshima survived even though the building was located only 1/5 of a mile from the exploding center, and the fire storm extended out to a distance of over one mile from this center. This is a case illustrating how a large public building can serve as an effective shelter even though no special effort has been made to design it for that purpose. Even clearer evidence is found in the official records showing that more than 85% of the 280,000 people in the fire storm area of Hamburg, Germany survived. Practically all of the more than 50,000 that sought shelter in bunkers, covered trenches and other non-basement shelters were saved. In addition, there are scores of cases of survival of experienced forest fire fighters who found shelter in tunnels, caves, or even under well-soaked blankets.

Although fears have been expressed that people would die from such things as the creation of a vacuum or the lack of oxygen, the evidence indicates clearly that no such danger occurs. There is, however, a real possibility of carbon monoxide poisoning. Since most of the burning in a given location is over in an hour or two in large mass fires, it would be wise to plan to close off the air supply of a shelter for approximately two hours. The principle danger from this step is the rise in temperature inside the shelter due to the body heat of occupants. If air is brought in by a vent, precautions should be taken in shelter construction to place the vent so that it will not be likely to be near smoldering rubble, since this rubble will generate carbon monoxide.

It is, of course, obvious that heat is of primary concern. It is interesting to note that an underground shelter with three feet of earth overhead will receive a negligible amount of heat during an hour or two of active burning overhead. As we have seen above, large buildings may also provide shelter from the fire's heat. Thus protection provided against fallout is also effective against fires if precautions against carbon monoxide are taken.

A recent OCD report dated July 1968, *Fire Aspects of Civil Defense,* (TR-25) outlines steps to be taken beforehand to reduce the danger of fire in a nuclear attack. These steps include reducing the amount of ignitable material such as paper, rotten wood, cloth (particularly rayon and cotton), and dried leaves exposed to thermal radiation from the bomb. Yards should be kept clear of such material and windows can be coated to reduce radiation reaching building interiors. Tests conducted with actual nuclear explosions by the Atomic Energy Commission show the marked resistence of well-painted (preferably light colored) wood surfaces compared to rough, uncared-for surfaces. Electricity and gas should be shut off prior to an attack. Garden hoses should be connected and ready for use and sand and blankets provided for immediate smothering of fires. It is clear that quick action of a "first aid" type by many people is needed to prevent small fires from coalescing into large ones. Regular city fire fighting equipment may not be able to move about because of streets littered and blocked by the blast wave.

The mass fires created in World War II were much smaller in area than those that can be expected from large H-bombs in the megaton range. These larger weapons would emit much larger quantities of thermal radiation over greater distances. Although the mass fires would extend over larger areas, they cannot be expected to be qualitatively different than those we have discussed above. For example, the inward moving winds of a fire storm turn upward at the edge of the fire and extend only about one half a mile into the burning area. Inside of this limit, the air motion is typified by turbulent up and down drafts. According to Broide, a larger fire storm would have these same properties and should not generate winds of appreciably higher velocities than those already experienced.

Weather and smoke conditions can have considerable influence on the effectiveness of a nuclear bomb in starting fires. A cloud layer above the explosion can reflect the radiation downward and increase its intensity on the ground. On the other hand, a cloud layer beneath the bomb will shield the ground. The size of the bomb, its height above the ground, and air transparency all affect the size of the area within which such materials as newspapers can be ignited. This is shown in Table 1 reprinted from OCD's TR-25 mentioned previously. A comparison is also made with the distance at which the blast wave falls to a strength where it does heavy damage to buildings (3 psi) and to light damage (1 psi).

TABLE 1.

Maximum Range of Newsprint Ignition and Selected Blast Pressure Radii

Weapon yield	Ignition ground radius (miles)		Blast ground radius (miles)		Height of burst (miles)
	Medium hazy day (6 mile visibility)	Clear day (12 mile visibility)	3 psi	1 psi	
1 megaton. . .	7	8	6	13	2
10 megaton. .	20	26	13	28	5
100 megaton.	44	59	28	60	11

If nuclear weapons are again employed in warfare, it will be necessary to combat fires as well as the other destructive

(continued on page 17)

IMPROVED BLAST OVERPRESSURE FORMULA

*A report of a recent overpressure formula refinement by C. M. Haaland, at Oak Ridge National Laboratory.**

In order to estimate the extent of damage from a nuclear explosion and to design resistant structures expected to be within predictable distances of such explosions in the event of a nuclear attack, it has been necessary to develop, mathematically, the magnitude of overpressure that would occur at varying distances from the detonation point of nuclear weapons. Data obtained during testing of a limited number of weapons (Ref. 1) are the basis of mathematical estimates; and in addition, lengthy calculations have been made of blast wave propagation (Ref. 2). These results have been used to predict the blast effects of weapons of all likely yields that might be expected in warfare.

It is useful, particularly in computer programs, to reduce long calculations to formulae that will maintain accuracy. Such a formula has been in use and is fairly accurate in dealing with overpressures between 10 and 50 pounds per square inch. This formula is:

$$R = \frac{6\,Y^{1/3}}{P^{1/2}} \qquad (A)$$

wherein R represents the distance in miles from a surface detonation of a weapon of yield Y in megatons (one megaton is the equivalent energy yield of the explosion of one million tons of TNT), and P represents overpressure in pounds per square inch (psi).

For overpressures under 10 psi, and over 50 psi, algebraic formulae have not been available for use in defense planning. Mr. Haaland has derived a formula with an extended range of accuracy as follows:

$$R = \frac{6\,Y^{1/3}}{[\,P^{1/2} - 0.02\,(P^{1/2} - 4)^2\,]} \qquad (B)$$

This correction extends the range of accuracy to include overpressure from 0.5 psi to 500 psi. Mr. Haaland points out that the formula is not accurate beyond these limits as the value of R will exceed the correct distance from bomb burst.

Table 1 shows the results obtained from the corrected formula (B) in analyzing a one megaton surface burst as compared with the earlier formula (A), with experimental data (Ref. 1), and with the lengthy blast wave computations (Ref. 2) which are the standards for accuracy. ■

Table 1.

Overpressures and Calculated Distances From Detonation One Megaton Surface Burst

Overpressure (P) psi	Distances From Detonation in Miles (R)			
	Formula (A)	Formula (B)	Experimental Data, Ref. 1	Theory, Ref. 2
0.5	8.49	12.4	12.3	No Data
1	6.00	7.3	7.3	5.3
9	2.00	2.0	2.0	1.9
16	1.50	1.5	1.5	1.5
49	0.86	0.88	0.89	0.87
100	0.60	0.65	0.65	0.66
200	0.42	0.50	0.47	0.51
400	0.30	0.40	No Data	0.40
500	0.27	0.38	No Data	0.36

**Operated by Union Carbide Corporation for the U. S. Atomic Energy Commission.*

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1. The Effects of Nuclear Weapons, *Samuel Glasstone, Editor, Revised Edition 1964, Published by the United States Atomic Energy Commission.*
2. Weapons Effects for Protective Design, *Harold L. Brode, RAND P-1951, March 31, 1960.*

Iowa Educators Look at Disaster Planning

The objective of sixteen school safety meetings currently being held throughout the state of Iowa is disaster planning. Conducted by the Iowa Department of Public Safety, these meetings will underline the need for shelter in public schools. They will attempt to measure shelter and disaster planning in terms of lives saved and the absence of shelter in terms of children killed.

Background disaster experience consists principally of the devastating 1968 Iowa tornadoes. They are fresh in the minds of community leaders, and their lesson is clear. A dramatic example is that of Charles City. Here on May 15th a tornado struck at 4:52 PM. Two minutes later 361 buildings had been totally distroyed, 13 persons had been killed, and over 400 had been injured.

Superintendent of Schools Harry Eastman witnessed the destruction of his three schools from the doorway of the school shelter where he had quickly herded 50 students and teachers remaining after the 3:30 PM school dismissal. Bruised, but not seriously injured, he explained what he saw in these terms: "It was angry power – power beyond comprehension or description – all tied up into a ball. I saw huge trees uprooted, buildings smashed and roofs torn from buildings. Trees not uprooted were bowed and twisted in all directions. Houses and buildings seemed to explode and crumble to ruins."

The current safety meetings, it is anticipated, will result in dual-purpose shelter in new school construction. ■

FIRE AND NUCLEAR WEAPONS

(continued from page 15)

effects. There is ample evidence to show that with planning and pre-attack precautions a large percentage of the people caught in a fire area surrounding an area of blast destruction can survive. Fire control continues to be an important aspect of civil defense, and the citizens of any nation determined to persevere must be prepared to fight fires effectively if attack comes. ■ (AAB)

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3. *"Fire Aspects of Civil Defense", Office of Civil Defense Report, revised edition, TR-25, July 1968.*
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SWISS ANECDOTE

Eugene Wigner tells this story:

When I arrived in Interlaken Switzerland for an international civil defense conference I was two hours early. In order to fill the time with something useful, one of the Swiss participants showed me a number of fine shelters in the neighborhood. He was most obliging. At the end of our little tour, impressed by what he had shown me, I asked what total amount Switzerland spent on civil defense. "Oh," my guide said, very politely, "I am sure it is hardly more than your country spends."

"In that case," I replied, "you spend about fifteen times more money per person for protection than we do."

"Well," he said, surprised and still wishing to be agreeable, "I don't think we spend more per person on civil defense than the USSR."

Realizing he was absolutely right, I shut up.

". . .We must have the will and the capacity to fight and win decisively. At the same time, civil defense becomes important. The eventuality of nuclear war must not leave us so prostrate that our republic cannot continue."

– Melvin R. Laird, Secretary of Defense

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EDITORIAL . . .

THE REWARDS OF HONESTY

The strict limits of expression under which scientists and engineers of the Defense Department and its Office of Civil Defense must work has been tellingly revealed by the Fitzgerald incident. Ernest Fitzgerald told the truth in testimony before a congressional subcommittee about a $2 billion error in cost estimating by the Defense Department. Twelve days later he was notified by the Pentagon that he no longer had Civil Service protection because he had received this protection by "computer error." Then, on January 16, Senator William Proxmire of Wisconsin read into the record a memo to Air Force Secretary Harold Brown from John Lang, Brown's administrative assistant, describing three procedures by which Fitzgerald could be fired.

Fitzgerald's mistake was that he put his country and the truth ahead of the Department of Defense. Undoubtedly many other dedicated people in the Department of Defense – including the Office of Civil Defense – would willingly give straight answers, as Fitzgerald did, on a vitally important matter. Nevertheless it is also clear that with the ever present threat of this type of repression, the nation's civil defense must not be entrusted exclusively to a bureaucracy. Bureaucracies will never recognize Robert Louis Stevenson's statement: "The truth suppressed by friends is the readiest weapon of the enemy."

It is a subdued national scandal that federal civil defense is still bound to the simplistic policy of providing protection only from fallout radiation. This policy was dubious even when first announced by the Executive Office of the President eleven years ago, and the Harbor Reports have more recently shown that it is now completely untenable. If civil defense is to begin to keep up with the continued rapid advances in the science of weaponry, the free market place for ideas which produced the Harbor Reports must function and, above all, exert influence on civil defense policy.

The Fitzgerald incident is a challenge to the ingenuity of Congress to create safeguards for those who place loyalty to truth and country first in their testimony to Congress. It is also a challenge to *Survive*, and all of us as individuals, to cultivate an informed and constructively critical concern for our civil defense, which is presently so deficient and yet so essential to our survival.

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