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CIVIL DEFENSE NEWS BULLETIN

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SURVIVING FIRE EFFECTS OF

— — — — NUCLEAR DETONATIONS — — — —

EDITOR'S NOTE: *The following article by Dr. A. Broido of the U.S. Forest Service, which appeared in the March 1963 "Bulletin of the Atomic Scientists", is reprinted in condensed form as an interesting and significant analysis of the value of shelters against thermal and fire effects of nuclear weapons. Reprints of the entire article are being furnished to local CD directors and are available to interested persons on request to the State CD Bureau*

"In recent analyses of the effects of nuclear weapons, thermal and fire effects have been receiving belated recognition as potentially more damaging for greater distances and with greater production of casualties than other blast or fallout effects. In fact, the larger yield weapons which are now available raise the possibility of high altitude detonations to maximize fire effects; such detonations present no early fallout hazard and, if sufficiently high, no significant blast effects.

"Thus, it is becoming increasingly clear that a major concern of any effective civil defense program must be to find means of minimizing thermal radiation and fire effects. Further, the problem is not restricted to wartime; mass fires may occur in peacetime, too, started by such events as earthquakes or a rambunctious cow knocking over a lantern. * * * This article focuses on the environment that is to be expected should a mass fire occur and considers possibilities of survival in such an environment.

"In seeking information about the environment in large scale fires we find, unfortunately, all too much practical experience to draw upon. London in 1666, Moscow in 1812, Chicago in 1871, San Francisco in 1906 are perhaps the best known examples. * * *

"The bombing attacks of World War II, however, added a new dimension to the fire problem. Large areas could be ignited more or less simultaneously, enveloping whole cities in fire and burning them to the ground in a matter of hours. The old city section of Hamburg took four days to burn in 1842. In contrast, in the fire raid on Hamburg on July 27, 1943, two-thirds of all the buildings in a five square mile area were ablaze within twenty minutes. * * *

"There is a tendency to forget that even before the introduction of atomic weapons at the end of World War II such total devastation had been inflicted a number of times by conventional fire attacks on cities in Germany and Japan. For example, a fire raid on Tokyo on March 9, 1945 caused a mass fire which destroyed an area of 16 square miles (compared with less than five square miles in Hiroshima and less than two in Nagasaki) and caused more than 80,000 deaths and more than 100,000 injuries, perhaps more casualties than in Hiroshima and Nagasaki combined.

*** VULNERABILITY OF FIRE AREA ***

"Since World War II, major improvements have been made in our weapons of destruction and little, if anything, has been done to decrease the fire vulnerability of our surroundings. Therefore, we can expect the results of any future conflicts to be even more catastrophic. * * * However, in considering the large fire areas that may be expected in a future attack with nuclear weapons, it is important to remember that these larger computed areas include bodies of water, deserts, etc., and that the total area of actual fire involvement would usually be much less than the total area encompassed in such computations. * * *

"Once a mass fire has formed, the usual prognosis for people trapped within the fire area is not very favorable. Statements from the most pessimistic sources on what might be needed to shelter these people are discouraging, to say the least. Often cited as illustrative of what can be expected in underground shelters in a fire storm area are the many victims found dead in 'shelters' in bombed German cities such as Hamburg.

"These pessimistic statements overlook the fact that the so-called shelters which served as death traps in Hamburg were all locations in basements of the typical many-storied, well-build German structures. When these structures were gutted by fire, people in basement shelters below could certainly be first asphyxiated and then cremated. *However, the official records show that more than 85 percent of the 280,000 people in the fire storm area of Hamburg survived—including practically all of the more than 50,000 who sought refuge in bunkers, covered trenches, and other non-basement shelters.* Also overlooked are such facts as the survival near ground zero at Nagasaki of the several hundred people who bothered to enter their hillside tunnel shelters and the survival of scores of experienced forest fire fighters in tunnels, caves, or even under well-soaked blankets in a cleared area in the middle of a roaring inferno.

* PROTECTIVE SHELTER PROSPECTS

"Experimental investigations into methods of increasing chances of survival in a fire zone have been conducted only on a scale small compared to the areas discussed above. However, many of the potential hazards are amenable to simple computation. * * * Some simple laws of nature preclude the possibility of a fire in a given fuel bed burning more fiercely and at the same time lasting much longer. *All things considered, the experimental results indicate that with certain precautions survival in simple underground shelters in the middle of a fire zone is highly probable.* * * *

(Continued on page 2)
Column 2

☆☆☆ FROM THE DIRECTOR ☆☆☆

The issue of the Saturday Evening Post which appeared on March 19th contained an article under the arresting title, "Survival of the Fewest," and subtitled, "The shocking truth. . . Millions would die needlessly. . ."

This is scarcely news to those who are laboring in the civil defense vineyard. The main point of the article, however, may well be news to many of the people who read it—namely, that millions of lives could be saved, in case of war, by the expenditure of a relatively few dollars now, to build the additional shelter spaces we must have to ensure national survival.

As last month's *News Bulletin* explained, we have *potential* shelter for about 2 million people in existing buildings in Wisconsin. We shall be fortunate to realize, from this potential, many more than 1.5 million actually marked and stocked, usable spaces, even with the hardest work by local CD Directors in the year ahead. That leaves 2.5 million citizens of Wisconsin without shelter, save what they may be able to provide for themselves.

OCD has proposed to Congress a Shelter Financing Program to fill this shelter gap—in plain terms, to provide life insurance for 2.5 million or more men, women and children in Wisconsin alone. If the authorizing legislation is approved by Congress, and if the necessary monies are appropriated, then schools, hospitals, and colleges, as well as welfare, governmental and other non-profit institutions, would be eligible to receive \$2.50 per square foot for shelter space added to new or existing buildings.

The Shelter Financing Program, even after Cuba, it seems safe to say, will be enacted and funded *only* if our Senators and Representatives hear from their constituents. They have many programs presented to them, from agriculture to conservation to foreign aid to highways. They can not be expected to be familiar with all of them, and the civil defense shelter program, to be realistic, is new and novel.

A Navy or Army appropriation may win approval based on the fact that all Members have at least a nodding acquaintance with the armed services. A civil defense bill or appropriation, on the other hand, may *not* get this benefit of the doubt, simply because the thermonuclear threat is new and the shelter program is new.

The Shelter Financing Plan, therefore, *must* have strong citizen support if it is to be enacted. And the citizens who support the plan must include not only civil defense directors, but parents, doctors, merchants, in fact every one who thinks it worth while to invest in national survival insurance.

The authorizing legislation is HR 3516 in the House of Representatives and S. 844 in the Senate. Letters supporting the Shelter Financing Program would properly go to interested citizens' own Representatives and Senators, also to Representative Carl Vinson, Chairman of the House Armed Services Committee, and Senator Richard Russell, Chairman of the Senate Armed Services Committee. (These Committees will be holding hearings on HR 3516 and S. 844, respectively.) Representatives and Senators may be reached at the House and Senate Office Buildings, respectively, Washington 25, D.C.

Sir Winston Churchill once remarked that democratic nations get the governments they deserve. Whether or not that observation is strictly true, it seems all too true that the United States will have the civil defense program it deserves. If enough citizens request that Congress take prudent precautions against the danger of nuclear attack, our Senators and Representatives will undoubtedly do so. If Congress does not hear from the people, we may not see the Shelter Financing Program in 1963—and we should not deserve to see it.

It might not be a bad idea for each person working in civil defense to pledge to himself that he will have at least six other people, *not* in CD, write to Congress.

EFFECTS OF NUCLEAR DETONATIONS --

(Cont'd. from page 1)

"It must be conceded that people trapped in the open or in combustible structures in mass fire areas will succumb from a large variety of effects, and in such situations speculations as to the major cause of death is most unprofitable. * * * Suppose, however, you are in a simple backyard shelter located so that neither the shelter nor its vent can be covered by rubble, with three feet of earth overhead and a mass fire raging around you. What can happen to you inside this shelter?

"One claim that has been made is that all the air will be sucked out of the shelter, implying the creation of an extreme vacuum overhead. *There is no evidence to indicate that anything but a very slight drop in pressure can possibly occur.*

"Another argument, which probably formed the rational basis for the first one, is that the fire will consume all of the oxygen in the vicinity. If one computes the amount of oxygen needed to completely burn the typical single family residence, he will find that the necessary oxygen is contained in a column with base equal to the area of the house and height of just a few hundred feet. If one includes the air available over the street, backyard, and other open spaces, this brings the necessary height down considerably lower. * * * Short range downdrafts between burning buildings and violent lateral movement of air will be superimposed on the general strong updrafts. Thus considerable internal mixing of air is bound to occur in all regions within the fire area and any general depletion of oxygen will be momentary at worst. One other interesting point to bear in mind is that there is a close relationship between the amount of oxygen necessary for human survival and the amount of oxygen necessary for combustion. *Thus, the continuation of active burning may be considered sufficient evidence that the oxygen concentration in the vicinity has not dropped below that necessary for survival.*

"The next argument is that large quantities of carbon monoxide and other toxic gases will be produced and will be drawn into the shelter. Unfortunately, experiments have shown that this is indeed possible. * * * However, it has already been mentioned that the amount of fuel available in any single location is consumed in a relatively short period of time—an hour or two of active burning at the most. * * * *Thus, if you can just close down your ventilation system for an hour or so, you should have little difficulty in surviving the flaming portion of the fire burning overhead, and, provided your vent is located so that it will not be buried by rubble, any air you draw in subsequently should be relatively free of carbon monoxide and other toxic gases.*

"The final concern of anyone underground in a fire area would be the heat. Here again it is easy to show that *heat transferred into the shelter through three feet of earth is negligible* and again the only problem that can conceivably occur would result from smoldering rubble piled high above the shelter.

"*Thus, all evidence, both from a study of the major fires of the past and from simple small-scale experimentation and theoretical considerations, points to the relative safety of an underground location in a cleared area within a mass fire zone. Simple fall-out shelters, built in the backyard rather than in the basement and with intake vents located as far as possible from any combustible material, can be expected to provide good protection against the fire as well as against the fallout effects of a nuclear detonation. Since such fire effects may, under the right circumstances, cover areas far exceeding the areas of severe fallout hazards, this additional feature should be considered carefully by anyone contemplating the construction of a fallout shelter.*" * * *

PHONE COMPANY BUILDINGS MARKED AS PUBLIC SHELTERS

Ken Keene, defense activities supervisor of the Wisconsin Telephone Company, has announced that over 60 of the company's buildings are being marked and stocked as public fallout shelters. Keene also said that all company buildings where there are operating and office forces have at least two employees trained in the use of the radiological instruments which are being provided by the federal government along with other supplies for stocking in the public shelters located under the shelter survey program.

In reference to the black and yellow signs being posted to mark shelter sites, Keene said, "When you see these signs on our buildings, as well as other public buildings, it means they are signs of survival for anyone. And 'anyone' includes, of course, employees and their families, whether they work in the building, live near it or are merely passing by it during an emergency."

Keene said because there is communications equipment located in the buildings' basements, shelter licenses specify only employees may use areas near this equipment. The public will be sheltered in other designated areas. He said that a shelter manager will be trained for each shelter area.

*** CD ***

FOUR NEW RURAL CD PUBLICATIONS AVAILABLE

The U.S. Department of Agriculture (USDA), in cooperation with OCD and the Public Health Service, has published four new publications for use in support of CD information activities in rural areas. They are:

- *Soils, Crops, and Fallout From Nuclear Attack (USDA PA-516)
- *Fallout and Your Farm Food (USDA PA-515)
- *Your Livestock Can Survive Fallout From Nuclear Attack (USDA PA-516)
- *Rural Fire Defense: You Can Survive (USDA PA-517)

The USDA Cooperative Agricultural Extension Service has made distribution to County Agricultural and Home Demonstration Agents throughout the U.S. Local CD directors may obtain copies from these sources or by writing to: Agriculture Bulletin Room, Agriculture Bulletin Building, University of Wisconsin, Madison. The publications may also be requested from the Civil Defense Branch, U.S. Army AG Publications Center through the State CD Bureau. However, a period of 30-60 days should be allowed for receipt of shipments from that source. When ordering, title and publication number should be specified.

*** CD ***

510 PERSONS COMPLETE CDAE COURSE IN FEBRUARY

According to a report received from Lloyd E. Berray of the State Department of Vocational and Adult Education, 510 adults completed the Civil Defense Adult Education (CDAE) course in February. This brings the total number of adults who have completed the course to 1,539.

Berray, who is a supervisor in the CDAE program, also reported that 90 teachers were in training in February and that a total of 218 teachers have completed the teacher training course. Courses were held in 22 new localities with an estimated number of 40 new courses to begin in March. All told, 23 courses were completed in February and a total of 59 have been completed to date.

*** CD ***

DEFICIENCIES CORRECTED IN 200-BED HOSPITALS

Louis E. Remily, Director of the CD Division for the State Board of Health, reports that all but a few deficiencies found by the General Service Administration (GSA) in a 1962 inspection of Wisconsin's 200-bed CD emergency hospitals have now been corrected.

Last summer GSA inspected 44 of the 56 units prepositioned at various locations in the state and found a total of 58 deficiencies in 24 of the hospitals. Twenty of the units had no deficiencies. Of the 24, only seven remain in need of corrective action, Remily said, and this will be accomplished as soon as possible.

He said, generally, the most common deficiency noted was inadequate fire protection and security. As soon as the GSA report was received, immediate action was taken, in cooperation with local directors, medical directors and custodians, to meet federal standards for proper maintenance and storage.

Percentage-wise, the GSA report showed Wisconsin CD hospitals as having the *least* number of deficiencies of any state in Region 4.

*** CD ***

SURPLUS DOSIMETERS RECEIVED BY SASP

The State Agency for Surplus Property (SASP) has received a limited quantity of pocket dosimeters which have been set aside at the request of the State CD Bureau for donation to *eligible* CD organizations.

The handling charge on this item is \$.75 each, with a *maximum* quantity of 10 available to any one organization in order to achieve an equitable distribution. Interested directors should submit their requests on the standard surplus property application form in triplicate to the State CD Bureau *through their Area Directors*. Applications will be processed in the order received until the supply of the item is exhausted. Applications not filled will remain on back order until this item is again available.

For application purposes, the Group No. of the item is 6665 and the description should read: "Landsverk radiac meter (pocket dosimeter). The instrument measures radiation from 0-600 roentgens and can be recharged on the Bendix charger contained in the kits previously received by many directors under the federal radiological training program. SASP will also ship orders to donee, if requested on application form.

*** CD ***

PUBLIC INFORMATION MATERIALS

Region 4 OCD has informed the State CD Bureau of the following status of publications PB-4, "Fire Fighting for Householders" and MP-15, "Family Fallout Shelter."

PB-4 is now being reprinted as H-8 retaining the original title. All back orders will be filled some time in April 1963. MP-15 will not be reprinted, but will be superseded by H-7, "Family Shelter Designs" and other publications to be printed at some future date. No information is presently available on the nature of these other publications.

OCD will soon furnish the State CD Bureau with prints of a new one-minute TV spot announcement titled "Shelter Sign Significance" which is to be used to support local shelter marking and stocking activities. Subject matter includes the people behind the shelter sign—the building owner, the civil defense director, first aid personnel, the use of radiological instruments, and supplies of food, water, and equipment. The CD Bureau will make automatic distribution of the spots to local directors where TV stations are located, as soon as they are received from OCD. Directors should personally contact their station managers when the spots are received and urge their extensive use in conjunction with local aspects of the program.



CIVIL DEFENSE AROUND THE STATE



*** what your neighbors are doing ***

WEST ALLIS - Results of Phase I and Phase II of the shelter survey program in this city were recently submitted to Mayor Arnold Klentz by Chester J. Newman, West Allis CD director. Among other things, the report shows that 114 shelter areas were checked during Phase I. Of these 114, re-examination during Phase II to determine the protection factor (PF) showed that 52 had a PF of 20-39 and are of no use; 14 had a PF of 40-99; 42 a PF of 100-1000; and 6 had no Phase II records. Originally only those shelters having a PF of 100 or over were to be stocked, but OCD has now indicated that those with a PF of 40-99 will also be stocked. As a result, total stockable spaces found were 20,551. Of the stockable shelter areas found 38 have been licensed, 10 are pending further action, 5 refused to be licensed, and 3 haven't replied to letters.

*** CD ***

MONTFORT - According to a report received from Elmer C. Mueller, city CD director, Grant county CD organizations now have eight Rescue Squad emergency vehicles manned by volunteer workers that have organized as a unit. Mueller also reports that all members have been qualified in first aid and that all areas are equipped with two-way radios on the Grant county sheriff's department frequency. An inventory of equipment has also been set up in order to expedite availability in event of emergency.

*** CD ***

EAU CLAIRE - Paul Boley, county CD director, reports, that four and one-half semi-trailer loads of supplies for stocking in 25 larger public shelters would shortly arrive at the Army Reserve Center on Keith street and would be distributed by reserves on a voluntary basis. Boley lauded the fine cooperation of the reserves in assisting in the shelter program. The supplies are slated to be stocked in shelters outside the rubber plant here, Boley said.

*** CD ***

SHEBOYGAN - County CD director, James P. Smyth, has turned out an excellent series of CD articles recently for the Sheboygan press on various aspects of the county's program. The articles were headed "Diary of A Civil Defense Director" and cover the shelter program, available training courses, fallout protection and other important subjects on civil defense. Smyth also has 15-minute weekly radio programs to help create a public awareness and stimulate interest among local citizens.

APPLETON - A contract has been awarded to the Graybar Electric Company, of Green Bay for design of a complete CD siren warning system in Outagamie. The system will be the first all-county warning system in Wisconsin, and probably in the nation. The Graybar Company was awarded the contract over four competing firms on their low bid of \$43,980. According to Lee Penney, county CD director, the firm will prepare specifications for the project which will then be submitted to the city-county CD committee for approval. After approval, the county will advertise for bids to install the system.

*** CD ***

PROGRESS REPORTS DUE

Local CD organizations and state agencies having CD responsibilities are reminded that 3rd Quarter program paper progress reports are due by *April 10, 1963*. Local directors should submit their reports to their Area Directors by this date.

In addition, 3rd Quarter P&A billings are due in the State CD Bureau not later than *April 20, 1963*. These billings should be sent monthly in order to avoid a heavy work load at the State office at the end of the quarter. Political subdivisions failing to submit progress reports and P&A billings by the aforementioned dates will be suspended from all Federal programs until they are received, in accordance with OCD regulations.

*** CD ***

DIRECTIVE ON FLOOD PRECAUTIONS ISSUED

The State CD Bureau issued a release to local CD organizations on March 15 alerting them to the possibility of spring floods and outlining certain precautions and preparations that should be taken locally to prevent or minimize this danger in potential flood areas. Although the Weather Bureau has indicated that no extensive flooding is foreseen, heavy rains or unseasonable temperatures could cause flooding in some areas.

*** CD ***

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