NEW YORK STATE COLLEGE FOR TEACHERS
ATOMIC DEFENSE ACTIVITIES

February 14, 1951

INTRODUCTION

Each Instructor is responsible for seeing that all of his classes are familiar with the current instructions relative to defense against atomic attack. Such instructions will be given during the first week of each semester. Every attempt will be made while discussing this matter to prevent misinformation as well as to answer the questions which arise. Mr. Mathews of Room 107 Draper will attempt to locate the answers to any questions on which information is not available at the college.

The following are the current instructions which should be brought to the attention of all concerned: "The explosion of an atom bomb results in three major effects: SEVERE SHOCK WAVE, EXTREME HEAT, and varying amounts of NUCLEAR RADIATION. The effective range of the bomb is approximately two miles and the blast duration is ten seconds. The heat flash, or thermal radiation, accounts for about 25% of the deaths and 50% of the casualties. The shock wave is responsible for about 50%-60% of the deaths, many of these caused by secondary hazzards, such as falling timbers, fixtures and flying glass. The nuclear radiation is fatal to about 15%-25% if the amount absorbed is large. If the amount is not very great, there may be various unpleasant symptoms, but apparently complete recovery takes place within six months. The shock wave is the most important agent in producing destruction, whereas thermal and nuclear radiations are at present not serious competitors in the production of damage by a bomb. While it has been established that there are no static defenses against the bomb effects, it has been definitely determined that proper active measures can be taken to minimize its results."

It is these active measures in which our students and staff should be instructed.

NOTE: Instructions from the Civil Defense Authorities state that until further notice or until a state-wide drill is held, students will not take their places on the floor, but that they will assume a crouching position beside their seats. (Where this is not possible in certain rooms the students will lean forward in their seats and protect themselves as well as they can.) The students designated to do so will pull the shades. It is the duty of the instructor and the building floor supervisor to devise the best possible arrangements for that particular room or place where the classes are being conducted. Instructors should appoint students for each job necessary and also designate alternates to cover cases of absence.

REFERENCE TO THE MAIN OFFICE MEANS THE COLLEGE SWITCHBOARD

(EXTENSION OFFICE) IN DRAPER HALL.

There are TWO TYPES OF ATTACK - SNEAK (OR UNEXPECTED) AND WARNED. There are different instructions needed for each type.

DEFENSE AGAINST A SNEAK (OR UNEXPECTED) ATTACK:

The first indication of an actual SNEAK ATTACK will be a sudden burst of light, followed by a shock wave in two or three seconds. This sudden increase in the illumination will be noticed even on the brightest days and will be followed by the shock wave whose effects may be minimized by the prompt taking of the actions indicated below. After the initial crouching in the classroom, the students will be moved to shelter to be prepared for possible further attacks. FOR DRILL PURPOSES THE SIGNAL FOR A SNEAK ATTACK WILL BE TWO SHORT AND ONE LONG RING REPEATED TWICE ON THE PASSING BELLS. ALL CLEAR WILL BE SOUNDED BY REPEATED LONG RINGS ON THE SAME BELL SYSTEM.

1. The instructor will signal the beginning of defense measures by saying, "ATOM BOMB, CROUCH AND COVER".

2. Students in seats nearest the window will fall to the floor as close as possible to the window and attempt to pull the shade by the cord which should extend below the window ledge; then they will take the protective position described in the next paragraph.

3. Students in all other seats will fall to the floor, (or if in seats in Room 20, Auditorium or other difficult seating arrangement, will lean forward in their seats) curling up so as to cover bare arms, hands, neck, face, and legs with the clothed body or articles of clothing.

4. Students will remain in this position until the instructor directs their row to move to the shelter (corridors or basement) assigned to the class. This direction should follow the shock wave.

5. After the shock wave, the instructor will move to the door and open it as quickly as possible.

6. Upon arriving in the corridor, each class will move along the halls toward the stairways, care being taken in assuming these stations to keep out of direct line across the hall from any window or doorway, and leaving room for others to pass down the center of the hall to other stations. Each student will take the same position as described in paragraph 3 above, on the floor as near as possible to the wall.

7. If students are out of doors, they will crouch on the ground in the position described in paragraph 3 above. However, if they are within two steps of a doorway, tree or large sheltering object, they may take shelter there in the crouching position.

8. Further movement will be made upon instructions from the Main Office. If no such information is forthcoming, the instructor will send a messenger to the Main Office (Extension Office in Draper Hall).

9. The Milne School will follow the instruction they have already received from Dr. Fossieck.

A WARNED ATTACK:

In the event that a warning is received of an impending atomic attack, students and all school personnel will in general move as quickly and quietly as possible to the designated shelters, keeping the center of corridors clear for the passage of emergency traffic and other students moving to a different shelter.

The warning of an impending attack may be transmitted to the college by one or more of the following methods: Sounding of the City Air Raid Sirens, transmittal of a voice message by messenger, or sounding of a raid warning by ringing the College and Milne passing bells. FOUR SHORT RINGS ON THE PASSING BELLS REPEATED THREE TIMES WILL BE THIS SIGNAL. Recall from the drill or the ALL CLEAR will be indicated by repeated LONG RINGS on the same bells used for the warning.

DEFENSE AGAINST A WARNED ATTACK:

1. When the college switchboard receives a warning, they will attempt to alert the college and Milne by the passing bell system - 4 short rings repeated 3 times.

2. The switchboard operators will keep all extensions open for further messages (interrupting calls when necessary).

3. The Milne Staff will proceed with their own instructions.

4. The instructor in each class will give warning by saying, "Atomic Defense Drill, Crouch and Cover", whereupon the students will take actions indicated for defense against a WARNED ATTACK which follow.

5. The instructor will move each class to the designated shelter, ROW by ROW so that no more than one row will be standing at a time.

6. Gym classes out of doors on the grounds will move to the gymnasium. Other personnel will move inside to shelter.

THE INSTRUCTOR WILL READ THE INFORMATION WHICH APPLIES TO HIS AREA AS INDICATED BELOW:

LIBRARY: Reading Room Supervisor - Miss Cobb
Commons " - student responsibility

a. Main reading room students will move directly to the stairway, down and out beneath the peristyle, keeping to the left, and taking stations along both walls of Lower Draper corridor as far as the Co-Op.

b. Commons people, if in the lower commons, will remain there, taking stations along the walls beneath and between the windows.

Commons people, if on the balcony, will move out the door, keeping to the right and taking positions along the walls of the lower peristyle as far as the entrance to Draper.

DRAPER: 1st floor supervisor - Mr. Gelbond
2nd " " - Mr. Phinney
3rd " " - Mr. Olson

a. First Floor will move out of the classrooms and offices to positions along the walls, taking care to avoid positions in the Rotunda.

b. Second Floor personnel will move along the walls of the second floor as far as the stairway to the 3rd floor, taking positions on both sides of the corridor, with the exception of Rooms 208, 209, 210 and 211. These mentioned rooms will move down the west stairway, using the righthand stairway only, to the Co-Op, turning right and taking positions under the peristyle as far as the entrance to Husted.

c. Third Floor classes will move down the stairway and position themselves along the WEST END walls of the Draper second floor taking care not to interfere with persons moving from there to the basement. (Paragraph b above)

d. Draper Basement people will clear the corridors quickly by moving into the men and womens' locker rooms taking positions shielded from windows and doorways.

HUSTED: 1st floor supervisor - Dr. Green
2nd " " - Mr. Tieszen
3rd " " - Mr. Spindel

a. First Floor people will move to the corridor remaining on the same floor taking care to leave passageways and stairways clear.

b. Second Floor people will move out of rooms and down the stairway to LOWER HUSTED in the area of the cafeteria and shops, taking care to leave room for the passage of emergency traffic to the cafeteria which may be used as an aid station.

c. Third Floor will move to the second floor, taking positions along the walls of the SOUTH END of Husted.

d. Cafeteria people will remain in the cafeteria, taking positions along the walls of the dining rooms.

RICHARDSON: 1st floor supervisor - Mr. Orton
2nd " " - Mr. Stokes
3rd - Mr. Burgess

a. First floor will remain in the corridors outside the offices and classrooms.

b. Second Floor, with the exception of Room 20, will move to the corridor taking positions along the walls, taking care to leave room for the movement of Room 20. Room 20 students will

move down the stairway to the basement, the women going into the girls room and the men on into the lounge. Overflow will cut off the end of the line and move into the first floor of Richardson.

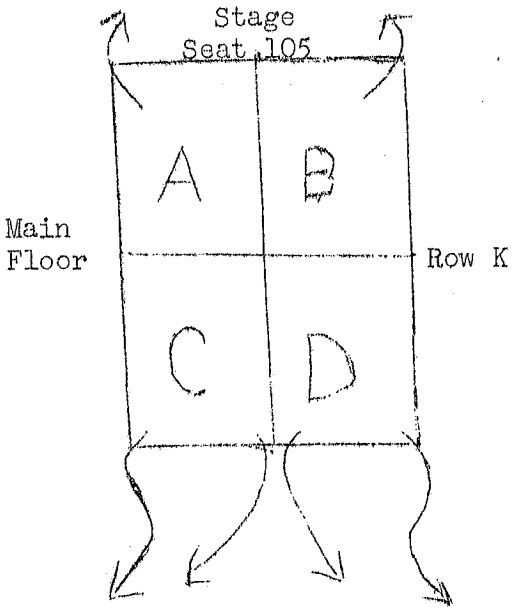
c. Third Floor people will move to the halls and remain on the third floor of Richardson.

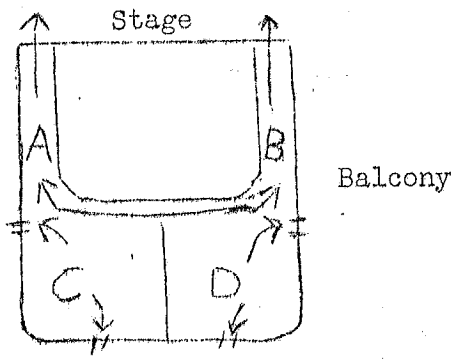
d. Lounge people will remain in the lounge, taking positions along the walls underneath the windows.

PAGE HALL: Auditorium supervisor - The person in charge of the assembly or meeting.
Gym - Mr. Hathaway or the person in charge of the class.

a. Gym people move to the side under the windows and under the balcony overhang.

b. Auditorium people will be divided into quarters at Row K and seat 105. The four sections of the main floor and the balcony will move to the nearest stairway, the main floor moving down to the gym level filling the stairways and taking positions along the walls of the passages. The balcony will move to the stairways and down as far as the main floor holding there and filling the stairways, taking care to avoid windows and doorways.





Miss Wagner

May, 1951

Directives

This material is for the information of the faculty and staff of NYSCT. You may use this material to help place Civil Defense on a greater factual basis with the student body. The inconvenience of the drills should be justified by the seriousness of the potential consequences.

Atomic Bombing and Civil Defense

There is a simple solution to the atomic bomb problem. The easiest thing to do is to bury one's head in the sand and hope that it will never happen to us. That is the easiest way. Unfortunately, it is not the safest.

There is no "perfect" or "safe" solution. In war, somebody always gets hurt. That is an irrefutable fact. But - intleeigent planning and a thorough fore-knowledge of what is involved can result in an enormous saving of life if and when the atomic bomb explodes over our cities and industrial centers.

In the event that the United States does become engaged in a shooting war that today looms ever closer, we must expect not only atomic bombs, but the full force of every weapon in the enemy arsenal.

To the military mind, there is clear logic in attacking civilians. Any condition that affects the morale, health, physical safety, economic conditions or working equipment of the civilian population is of tremendous advantage to the enemy. He will attempt to press not only his physical weapons, but also every possible means of internal dissolution, against our ability to wage war.

In today's air-atomic age there is no longer a dividing line between the man wearing a uniform and the so-called civilian on the home front. They are solidly linked together by the exigencies of modern war. And in the final analysis it may well be the civilian who will prove the deciding factor in victory or defeat.

Because the progress of the "shooting" war depends upon the fulfillment of industrial obligations by the home front, and because no military force in the field can exist without a steady flow of supplies, our industrial centers are destined to become the scene of combat and devastation. This lesson was bitterly learned by the Germans and Japanese as their cities literally disappeared under a fusilade of high explosive and incendiary bombs.

Therefore, the civil defense organization that permits continued function of home front industrial activities while under enemy attack has assumed importance rivalling that of any military organization. Civil defense has come of age.

WHAT WE HAVE LEARNED

We have learned much from the experience of others. During the last war, German cities underwent the most intensified, sustained aerial bombardment in history. Berlin alone received the punishing weight of more that 67,000 tons of bombs, in addition to damage wrought by artillery and hand-to-hand fighting.

We have learned from the Japanese - who helplessly witnessed 66 of their largest cities laid to the torch and burned to cinders. We have studied, noted and evaluated the effects of the atomic bombing of Hiroshima and Nagasaki, and added to our knowledge by extensive experimentation with atomic weapons at our proving grounds within the past few months.

But as terrible as the atomic bombings of Hiroshima and Nagasaki were, we did not lose sight of the fact that on the night of March 9th, 1945, 2,000 tons of incendiary bombs turned sixteen square miles of Tokyo into a roaring inferno that brought death to more than 110,000 people. Of the raid of May 26th, 1945, when B-29s fired some nineteen square miles of Tokyo. In comparison, Manhattan is less than 23 square miles.

Any writer could have duplicated, with minor changes, an article the parallel of John Hersey's famous "Hiroshima" from any large German or Japanese city. He could have written in stark detail of the many square miles burned out and reduced to charred rubble in Hamburg, of the terrible fire storms where the suction of the superheated air ripped trees three feet in diameter from the ground by their roots, of temperatures soaring to 1,472 degrees F, and of block after block transformed into rivers of fire when asphalt took flame.

From the lessons of the Second World War and our subsequent atomic weapons experimentation, the effects of atomic attack have been greatly pinpointed

to the extent where the mystery has disappeared. We have never regarded the atomic bomb as a superweapon against which there is no defense, but as an extremely powerful weapon against which, like any other weapon, certain defensive measures are quite effective and practical.

THE PROBLEM WE FACE TODAY

"No fear is greater than the unknown except the fear of the half-seen." Nothing could be more applicable to the current atom-hysteria which has swept much of our population. Too many people have seen only the horrible side of the atomic bomb, losing sight, at the same time, of many pertinent facts regarding the Hiroshima and Nagasaki attacks.

Until we can eliminate the hindering blocks of panic, irresponsible thought, rumor-mongering and downright apathy, we are leaving ourselves wide open for disaster.

Let's be sensible about this thing. The Hiroshima and Nagasaki episodes added less than three per cent to the aerial devastation already rained on Japan. With the country helpless and the skies controlled by the enemy, the annihilation of Japanese cities had resolved into a mere trucking job.

At the same time, it is as serious a mistake to minimize the gravity of the situation as it is to overemphasize it. A sober, middle-of-the-road policy is a necessity for survival. There can never be an invulnerable defense protecting our continent. We are bound to receive the brunt and fury of many attacks.

Since the only true defense against the atomic bomb is not be be there when it explodes, we must do the next best thing - prepare to protect ourselves as much as possible against the day when we will actually be bearing up under atomic attack.

THE ATOMIC BOMB AND ITS EFFECTS

No one publication can possibly tell the full story of atomic attack and atomic protection. There is a vast background of information on atomic bombing that can prove to you the effectiveness of civil defense preparations, adequate protection and the necessity of eliminating panic-stricken thought from our current thinking.

Many of you have often read of the bombings of Hiroshima and Nagasaki, how an entire city and more than 70,000 people were destroyed in the twinkling of an eye. We have heard, and many of us have shuddered, at the stories of horrible radiation effects, mass sterility and mutations. We are beseiged with tales prophesizing our doom of the destruction of our cities and the ravaging of our country by thousands of atomic bombs.

This is pure hogwash. Most of the devastation and casualties in Japan were caused by fire - pure and simple fire. The casualties in the two atom bombed cities were not caused in the "twinkling of an eye" at all, for several weeks and months passed before injuries, sickness and radiation took their final toll. There was no permanent sterility in Japan from atomic bombing, and there has not been one case of abnormal or mutative birth.

One must see to believe the flimsiness of the average Japanese wooden structure, many of them termite-eaten, and dry-rotted for generations. They are top-heavy with thick, tile roofs, used to protect them from sparks, should neighboring houses catch on fire. Sometimes houses tumble down without apparent reason, expiring, as it were, from sheer old age.

The atomic bomb is essentially a saturation weapon. It telescopes dozens of conventional bombings into the space of ten seconds and in the process engulfs, saturates and "swamps" the normal disaster-resisting capabilities of the average city.

That is what happened at Hiroshima. All the fragile structures collapsed and thousands of fires broke out simultaneously. Most of the inmates were helplessly trapped. With few exceptions, the streets were extremely narrow, an average of thirty feet in width. Falling houses clogged them and filled them simultaneously.

Most of the fire-fighting equipment and personnel in the city were knocked out in the one tremendous explosion. Water pressure went down to a bare trickle and organized fire-fighting was non-existent. A tremendous fire storm

gutted the heart of the city.

Because of an inadequate warning system (Japanese Early Warning Radar had detected the three B-29s), because of general apathy on the part of the population which so far had been spared bombing, because of lack of civil defense preparations, some fifty thousand or more people who died in Hiroshima died without reason!

In Hiroshima the survivors, many of them injured, bleeding, dazed from burns and shock, and doomed, though they did not know it yet, from the effects of nuclear radiation, fled the city in throngs. The Japanese are a stolid, down-to-earth people, capable of bearing up under unbelievable hardship and privation, yet they fled the city in wild panic. Their initial panic was due not so much to the effects of the atom bomb as to the fact that Hiroshima had almost no warning system and no civil defense training of any consequence.

The Japanese estimate that approximately twenty-thousand people at Hiroshima that died were victims of panic alone: in the mad, insane rush to flee the city they were pushed off bridges, trampled underfoot, and rushed wildly into fires. In addition, lack of civil defense preparedness in the way of adequate medical services, housing and shelter, food and clothing brought deaths to many thousands that otherwise would have survived.

It is also a fallacy that everybody within a half-mile of ground zero is doomed. At Hiroshima, steel-reinforced concrete buildings 700 feet from ground zero stood up amazingly well against the blast. A semi-buried, timber-supported shelter covered by four feet of dirt enabled its occupants to survive the atomic explosion only 300 feet from ground zero at Nagasaki.

One of the outstanding examples of shelter effectiveness is to be found in the bombing experience at Nagasaki. Some 400 people crowded into tunnel shelters that had been dug into the sides of a small hill, supported by timbers. This shelter, of crude construction, was approximately 100 yeards from ground zero. Yet, with the exception of a few people who had been near the tunnel entrances and were knocked about by the blast, every one of those 400 people came through the atomic explosion uninjured.

It is a matter of history, included in the United States Strategic Bombing Surveys, that fifty out of every 100 people within one mile of zero at Hiroshima lived to talk about their experiences. And at Nagasaki, 69 out of every 100 people within a mile of zero lived to be potential great story tellers.

Perhaps no aspect of atomic bombing has received more fantastic distortion than that of radiation. It has run the public gauntlet as a weapon that will bring about immediate total annihilation of the human race to something that alters human offspring to the extent where our future generations will be made up of two-headed monsters and misshapen freaks. Such stories belong in weird and fantasy magazines.

THE FUTURE

Much has been spoken of the mass evacuation of American cities. There has developed among certain groups in this country a "take to the hills" mentality, and there is a tendency on the part of some people to visualize any attack here by the enemy as the signal for a sort of group vacation on the part of thousands of city dwellers-who will dash into the country "till the whole thing blows over."

No picture could ignore reality more tragically than this. No community can exist as a productive force if its workers are scattered to the four winds. And no nation can defend itself successfully by needless, wholesale desertions in the face of actual or threatened enemy fire.

It is time to get tough with ourselves over this question of what will happen if we are attacked. There cannot be and there will not be any mass stampede from our critical target areas, for the simple reason that no such stampede will be permitted by the state and local authorities who are responsible for the citizen's safety and welfare and our national security.

Let us not kid ourselves. If and when the chips go down, it must be war for all without exception. The essence of modern war and the end towards which all plans are directed is swift action. When the need for action arises, every move must be right. The penalty for uncertainty, fumbling or failure is needless injury, suffering and death.

The Atomic Explosion

The effects of the atomic explosion are dependent upon the kind of burst involved, whether air, surface, or water, or a variation of the three types mentioned here. Each type of burst creates its own particular kind of havoc, though the explosion principle remains the same.

The atomic explosion involves only seconds. But in those few seconds, all four of the bomb's effects--thermal radiation, penetrating radiation, shock wave and wind--are released almost simultaneously, so that, for all practical purposes, they seem to occur together.

The type of atomic bomb discussed here is the nominal bomb, i.e., a bomb of the Nagasaki type--exploding with the equivalent of 20 Kilotons of TNT.

Air Burst

Greatest overall destruction is caused when the bomb is exploded at an altitude of approximately 2,000 feet. The major effects of this explosion are:

Flash Heat: 1/10,000ths of a second after detonation, a 90-foot fireball with a surface temperature of 300,000° C. is created, generating maximum light. 15/1000ths of a second after detonation, it has expanded to a width of 600 feet, and a split-second dimming--the minimum light stage--occurs. The shock wave then separates from the fireball, spreading out in all directions. One second after detonation the fireball has reached its maximum width of 900 feet, generating intense light and heat. By now the shock wave is bursting outwards though it has not yet reached surface level.

Beneath the fireball the ground is momentarily heated to a temperature of 7,000° C. Corresponding to the distance from the fireball, temperature begins to drop rapidly. At 5.7 miles, the fireball gives off greater light than 100 suns, more than enough to temporarily blind the unshielded eye. To the shielded eye, there is a fantastic blue or green burst of dazzling light, dimming gradually. Ten seconds after detonation, the fireball has lost most of its brightness and has risen to a height of 3,500 feet.

Up to one and a half miles from ground zero, the skin may be charred black and destroyed when unprotected. Flash fires, igniting inflammable material up to four miles away, creates a mass of fires simultaneously over a great area. This heat is gone within one to three seconds after detonation.

It has been estimated that a bomb dropped from the air, penetrating 40 to 50 feet below surface before detonation, would cause blast damage over radii of about one-half to two-thirds of the radii for corresponding damage due to an air burst. Reflection of the shock wave from rock strata depths of less than 200 to 300 feet would probably result in an appreciable increase in the area of damage.

Radiation: Two types of radiation, what may be regarded as penetrating and non-penetrating radiation, are released the instance the bomb explodes.

Non-penetrating--alpha and beta radiation--are stopped by the thinnest shielding. A sheet of paper or even the skin will stop alpha radiation, and beta rays are stopped by just several hundred feet of air. Their danger lies in residual radiation effects.

Penetrating radiation--gamma rays and neutrons--are the most dangerous. Though neutrons possess the greater penetrating powers, they do not move to great distances from the bomb and there is little danger from them more than a half mile from ground zero. There, greatest danger is when they penetrate objects in great strength and irradiate those objects, causing lingering contamination of lethal nature.

Gamma rays also have high penetrating powers and extend for considerable distance from ground zero. They will cause 50% deaths of all people 3,000 feet within ground zero who are protected by 12 inches of concrete, and about 50% of all exposed persons within 4,200 feet of ground zero will probably die.

Beyond this point, the gamma ray intensity drops off rapidly. While in some cases its effects may be felt later at a distance of two miles, its effective limit for causing injury of serious nature is one and a quarter miles. More than one half the gamma ray damage is done in the first second, but gamma rays continue to radiate in diminished strength for 100 seconds. One minute

after the explosion, the danger of residual or airborne radiation may be considered past.

Shock Wave and Blast: When the fireball is created a shock wave forms about it. This is a shell of air compressed so tightly that it glows white-hot and expands with tremendous force--from this expansion and the following winds the greatest destruction is caused.

The pressure wave bursts out like a solid steel wall at an initial velocity of a thousand miles per hour, and reaches one mile within four seconds. In some instances it is joined by a reflected shock wave from the ground in what is known as the "Mach front" and its effect is doubled.

Directly behind the shock wave comes a wind roaring across the ground at 800 miles per hour, bringing with it the sudden, enveloping, thundering of the bomb, and also creating the great dust and dirt clouds over the ground. By the time it reaches a mile from ground zero, it is moving at 200 miles per hour, and at one and a half miles is down to 100 miles per hour.

Within one-half mile of ground zero, flash burns are almost certain to be fatal to all exposed persons. It still carries lethal powers up to a mile and a quarter, and will inflict serious burns at two miles and minor burns up to three miles, depending upon the weather.

Approximately 20 minutes later, fires which have been started by collasping buildings and the explosion's thermal radiation are growing rapidly. A cloud of hot gases has risen to about 40,000 feet and is being dispersed by upper atmosphere winds. Air is sucked inward by the rising gases and creates high winds which converge on the city, quickly fanning the fires into a swirling fire storm that reaches its peak of 40 mph winds and flame about two to three hours later.

Water Bursts

First indication of the shallow water burst is a shock wave that will cripple or sink every ship within a half mile and damage buildings for a mile around.

Immediately after the detonation and subsurface creation of the fireball, a hollow column of water and spray is hurled into the air. It expands until it is about a half-mile wide and reaches from 6,000 to 8,000 feet in height. This tremendous column is essentially hollow, with the walls of water about 300 feet thick, containing some 1,000,000 tons of water. At the top of the column it is crowned with a huge-cauliflower shaped cloud.

The base surge, a bank of radioactive fog resembling water in its actions, rolls rapidly for a mile and a half in every direction, lifting after a few minutes to release a downpour of radioactive rain, mud, sand and silt.

The tremedous waves from the base of the explosion reach an initial height of nearly 100 feet. They are 20 feet high one mile away and 10 feet high 2 miles away.

The shock wave of the shallow underwater burst is equal to 4 kilotons of TNT, and such a bomb exploded one-half mile from shore would seriously damage harbor facilities, warehouses and other structures near the shore, with appreciable damage a further distance away. Light damage--plaster cracking and window breakage, will extend to four miles.

The radioactive cloud and mist will lethally contaminate the area upon which it falls--this being dependent upon prevailing wind conditions.

Surface and Subsurface Bursts

Calculations indicate that destructive earth-shock effect would probably occur to a radial distance of 1,350 to 3,300 feet from the point of underground explosion of an atomic bomb, with appreciable damage to walls, chimneys and foundations expected 1,800 to 5,000 feet from the origin. The limits of the radial distance for light damage would range from roughly 2,700 to 10,500 feet.

Behind the wind is a partial vacuum, which acts like another wind (suction phase) coming from the opposite direction, and about half the strength of the first wind blast. Three miles from ground zero, shock wave, wind and vacuum begin to peter out. Depending upon terrain, the wind may rip houses apart four

miles from ground zero, cause minor damage at six miles and smash plaster and glass up to eight miles.

It seems highly probable that the shock and below-surface rock displacements would produce damage to any underground structures such as subways and foundations; extent of the damage depending upon the kind of rock strata near where the bomb was exploded.

Wall-bearing buildings would undoubtedly collapse at considerable distances from ground zero and would be most hazardous to occupy. Wood-frame buildings would resist reasonably well depending upon the method of support. Brick piers would fall as would brick chimneys. The probable result would be the shifting of the structure on its foundations with the possibility of dropping it to the ground if supported on brick piers.

All underground utilities would suffer greatly from the displacements caused by the shock, particularly sewer, gas and water mains. Electrical lines would suffer much less due to their ductility, but above ground lines would be damaged by tower and pole distortion which might result in breakage of the wires.

If a nominal atomic bomb were dropped in such a manner as to explode at a depth of approximately 50 feet in ordinary soil, a crater about 800 feet in diameter and 100 feet in depth would be produced. Shape and size of the area over which the expelled material is spread will be governed to the greatest extent by the strength and direction of the wind. Material expelled from the crater would be highly radio-active, due to presence of trapped fission products and of material activated by neutron irradiation.

(Extracted by Elmer C. Mathews, NYSCT, from publications of Mr. Martin Caidin, Technical Specialist of New York Civil Defense Commission)

DISTRIBUTION

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Total - 210 copies

William C. Lackey

NOTICE: There will be a College Civil Defense Drill (Warned Attack) Thursday, November 15. (Time to remain unannounced.)

E. C. Mathews

PUBLISHED AS "CHANGE 1","CHANGE 2", ETC. FOR YOUR INFORMATION AND CORRECTION IN THESE BASIC INSTRUCTIONS.

A. INTRODUCTION

Instructions from the Civil Defense Authorities state that until further notice or until a state-wide drill is held, students will not take their places on the floor, but that they will assume a crouching position beside their seats. (Where this is not possible, the students will lean forward in their seats and protect themselves as well as they can.) The students designated to do so will pull the shades only during a WARNED ATTACK. It is the duty of the instructors and the building floor supervisors to devise the best possible arrangements for that particular room or place where classes are being conducted. Floor supervisors and instructors should appoint students for each job necessary and also designate alternates, faculty or student, to operate in cases of absence.

1. Each instructor is responsible for seeing that all of his classes are familiar with the current instructions relative to defense against atomic attack. Such instructions will be given, wherever possible, during the first week of each semester. Every attempt will be made while discussing this matter to prevent misinformation as well as to answer the questions which arise.

Mr. Mathews of Room 107 Draper will attempt to locate the answers to any questions on which information is not available at the college.

2. Medical personnel will be generally located in the CAFETERIA AREA.

3. Reference to MAIN OFFICE means the college switchboard in Draper Hall.

4. The Bomb and its Effects:

The explosion of an atom bomb results in three major effects: Severe Shock Wave, Extreme Heat, and varying amounts of Nuclear Radiation. The effective range of the bomb is approximately two miles and the blast duration is ten seconds. The heat flash, or thermal radiation, accounts for about 25% of the deaths and 50% of the casualties. The shock wave is responsible for about 50%-60% of the deaths, many of these caused by secondary hazards such as falling timbers, fixtures and flying glass. The nuclear radiation is fatal to about 15%-25% if the amount absorbed is large. If the amount is not very great, there may be various unpleasant symptoms, but apparently complete recovery takes place within six months. The shock wave is the most important agent in producing destruction, whereas the thermal and nuclear radiations are at present not serious competitors in the production of damage by the bomb. While it has been established that there are no static defenses against the bomb effects, it has been definitely determined that proper active measures can be taken to minimize its results.

NEW YORK STATE COLLEGE FOR TEACHERS, ALBANY

ATOMIC DEFENSE ACTIVITIES

October 1951

THESE ARE BASIC INSTRUCTIONS. ANY CHANGES WILL BE PUBLISHED AS "CHANGE 1","CHANGE 2", ETC. FOR YOUR INFORMATION AND CORRECTION IN THESE BASIC INSTRUCTIONS.

A. INTRODUCTION

Instructions from the Civil Defense Authorities state that until further notice or until a state-wide drill is held, students will not take their places on the floor, but that they will assume a crouching position beside their seats. (Where this is not possible, the students will lean forward in their seats and protect themselves as well as they can.) The students designated to do so will pull the shades only during a WARNED ATTACK. It is the duty of the instructors and the building floor supervisors to devise the best possible arrangements for that particular room or place where classes are being conducted. Floor supervisors and instructors should appoint students for each job necessary and also designate alternates, faculty or student, to operate in cases of absence.

1. Each instructor is responsible for seeing that all of his classes are familiar with the current instructions relative to defense against atomic attack. Such instructions will be given, wherever possible, during the first week of each semester. Every attempt will be made while discussing this matter to prevent misinformation as well as to answer the questions which arise.

Mr. Mathews of Room 107 Draper will attempt to locate the answers to any questions on which information is not available at the college.

2. Medical personnel will be generally located in the CAFETERIA AREA.

3. Reference to MAIN OFFICE means the college switchboard in Draper Hall.

4. The Bomb and its Effects:

The explosion of an atom bomb results in three major effects: Severe Shock Wave, Extreme Heat, and varying amounts of Nuclear Radiation. The effective range of the bomb is approximately two miles and the blast duration is ten seconds. The heat flash, or thermal radiation, accounts for about 25% of the deaths and 50% of the casualties. The shock wave is responsible for about 50%-60% of the deaths, many of these caused by secondary hazards such as falling timbers, fixtures and flying glass. The nuclear radiation is fatal to about 15%-25% if the amount absorbed is large. If the amount is not very great, there may be various unpleasant symptoms, but apparently complete recovery takes place within six months. The shock wave is the most important agent in producing destruction, whereas the thermal and nuclear radiations are at present not serious competitors in the production of damage by the bomb. While it has been established that there are no static defenses against the bomb effects, it has been definitely determined that proper active measures can be taken to minimize its results.

5. Two Types of Attack:

There are two types of attack: SNEAK (unexpected) and WARNED. There are different instructions needed for each type.

B. ACTIVE MEASURES

1. Defense Against A Sneak or Unexpected Attack:

The first indication of an actual SNEAK ATTACK will be a sudden burst of light, followed by a shock wave in two or three seconds. This sudden increase in the illumination will be noticed even on the brightest days and will be followed by the schock wave whose effects may be minimized by taking the action indicated below.

For drill purposes the signal will be given by the instructor upon a pre-arranged signal since the bell system cannot give the proper reaction necessary.

a. The instructor will say, "ATOM BOMB, CROUCH AND COVER".

b. Shades will not be drawn during a sneak attack. (Too late for radiation protection)

c. All personnel will fall to the floor (or in accordance with previous instructions on page 1), curling up so as to cover bare arms, hands, face, neck and legs with the clothed body or articles of clothing.

d. All will remain in these positions until the instructor directs their row to move to the shelter area assigned to the class. This direction should follow the shock wave. (10 seconds)

e. After the shock wave, the instructor, leaving the room first, will move to the door and open it as quickly as possible. After personnel have left the room, the instructor will close the door and follow the class to the shelter area.

f. Upon arriving in the corridor, each class will move along the halls toward the stairways, care being taken in assuming these stations to keep out of direct line across the hall from any window or doorway, and leaving room for others to pass down the center of the hall to other stations. All personnel will take the same positions as described in paragraph "c" above, on the floor as near as possible to the wall.

g. If students are out of doors, they will crouch on the ground in the position of "c" above. However, if they are within two steps of a doorway, tree or large sheltering object, they may take shelter there in the crouching position.

h. Further movement will be made upon instructions from the Main Office. If no information is forthcoming, the instructor will send a messenger to the Main Office.

i. The Milne School will follow instructions they have received from Dr. Fossieck.

NOTE:

In the event a warning is received of an impending atomic attack, students and all school personnel will in general move to designated shelter areas as quickly and as quietly as possible, keeping the center of corridors clear for emergency traffic.

The warning of an impending attack may be transmitted to the college by one or more of the following methods: Sounding of the city air raid sirens, transmitted voice message by messenger, or sounding of a raid warning by ringing the college and Milne passing bell systems.

CONTINUOUS SHORT RINGS ON THE PASSING BELLS WILL BE THE LOCAL SIGNAL FOR A WARNED ATTACK.

RECALL from the drill or ALL CLEAR will be indicated by CONTINUOUS LONG RINGS on the same bell system.

2. DEFENSE AGAINST A WARNED ATTACK:

a. When the switchboard received a warning, they will attempt to alert the college by the passing bell system. (Continuous short rings on the passing bells.)

b. The switchboard operators will keep all extensions open for further messages (interrupting calls when necessary).

c. The Milne staff will proceed as instructed by the principal.

d. The instructor in each class or assembly or meeting will call, "ATOM BOMB, CROUCH AND COVER."

e. All personnel will crouch and cover and immediately the person in charge will start to move the class to the shelter area...ROW by ROW...so that no more than one row will be standing at a time.

f. At the same time, the students designated to do so will pull the shades(if it is possible and the shades are in operational condition, since shades afford protection from radiation.)

g. Gym classes and out of door personnel will move to the nearest shelter.

C. SHELTER AREAS:

Each instructor and floor supervisor must be familiar with the following information which applies to their areas. (Signs will be posted at a later date.)

1. LIBRARY: Supervisor - Miss Cobb

a. Reading Room Upstairs - Personnel will move directly to the stairway, down and out beneath the peristyle, keeping to the left, and taking positions along both walls of lower Draper as far as the Co-Op.

b. Basement Reading Room - Personnel on the balcony will remain on the lower floor taking positions along the walls beneath and between the windows. Those on the BALCONY will move out the door taking positions along the walls between the windows on the right as far as the entrance to Draper.

2. DRAPER (Main):
   1st floor supervisor - Mr. Gelbond
   2nd " " " - Mr. Standing
   3rd " " " - Mr. Phinney

a. First Floor personnel will move out of the classrooms and offices to positions along the walls, taking care to avoid positions in the ROTUNDA.

b. Second Floor personnel will move out and take positions along the walls on both sides of the corridor as far as the end stairways.

c. Third Floor classes will move down the New Draper Center Stairways taking positions in the stairwells from the basement to third floor levels, remaining in the stairwells and keeping close to the walls.

d. Draper Basement people will clear the corridors quickly by moving into the men and womens locker rooms taking positions shielded from windows and doorways.

3. DRAPER (Extension):
   1st floor supervisor - Mr. Beaver
   2nd " " " - Mr. Childers
   3rd " " " - Mr. Cooper

a. First Floor classrooms and lounge will move to the connecting corridor between Draper and Draper Extension taking positions along the walls.

b. Second Floor personnel will move into the second floor connecting corridor in the same manner as the first floor.

c. Third Floor personnel will move quickly down the Washington Ave. stairway to the basement connecting corridor, lining the walls of the new basement and the connecting corridor.

EXCEPTION Room 349 will move out the rear exit to the third floor of Draper Main taking positions along the walls of the third floor.

4. HUSTED:
   1st floor supervisor - Mr. Andrews
   2nd " " " - Mr. Tieszen
   3rd " " " - Mr. Spindel

a. First Floor people will move to the corridor remaining on the same floor taking care to leave passageways and stairways clear.

b. Second Floor people will move out of rooms and down the stairway to LOWER HUSTED in the area of the cafeteria and the Commons, taking care to leave room for the passage of emergency traffic to the cafeteria which may be used as an aid station.

c. Third Floor will move to the second floor, taking positions along the walls of the SOUTH END of Husted.

d. Cafeteria and Commons people will remain in the cafeteria and Commons, taking positions along the walls of the dining rooms and the Commons.

5. RICHARDSON:
1st floor supervisor - Mr. Orton
2nd " " " - Mr. Stokes
3rd " " " - Mr. Burgess

a. First Floor will remain in the corridors outside the offices and classrooms.

b. Second Floor, with the exeeption of Room 20, will move into the corridor taking positions along the walls, taking care to leave room for the moevment of Room 20. Room 20 students will move down the stairway to the basement, the women going into the girls room and the men on into the lounge. Overflow will cut off the end of the line and move into the first floor of Richardson.

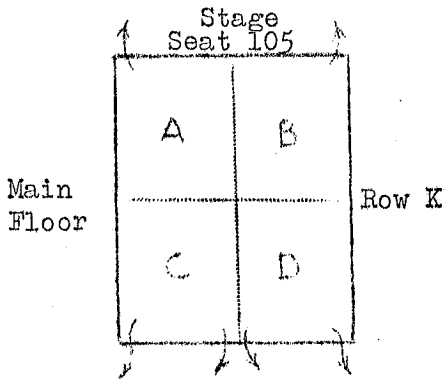
c. Third Floor people will move to the halls and remain on the third floor of Richardson.

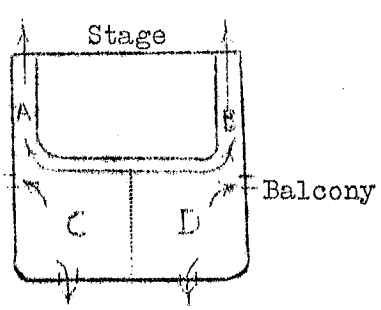
d. Lounge poeple will remain in the lounge, taking positions along the walls underneath the windows.

6. PAGE HALL:
Auditorium Super - the person in charge of the assembly or mtg.
Gym " - Mr. Hathaway or the person in charge of class

a. Gym people move to the side under the windows and under the balcony overhang.

b. Auditorium people will be divided into quarters at Row K and seat 105. The four sections of the main floor and the balcony will move to the nearest stairway, the main floor moving down to the gym level filling the stairways and taking positions along the walls of the passages. The balcony will move to the stairways and down as far as the main floor holding there and filling the stairways, taking care to avoid windows and doorways.





Wagner, Margaret

May 2, 1958

SUBJECT: CIVIL DEFENSE PROCEDURE

TO: ALL FACULTY & STAFF

FROM: A. C. MATHEWS

TAKE COVER SIGNAL - 3 minute WAVERING SIREN WAIL. (Re-enforced by college bells, if possible).

ALL CLEAR - 3 minute STEADY SIREN (Re-enforced by college bells, if possible).

NOTE - Floor Supervisors do not report to switchboard unless having difficulty.

WHAT TO DO - Clear classrooms, and offices, close doors, avoid windows and open areas. Keep passageways clear and exit doors clear. Always leave room for emergency traffic to pass through.

WHERE TO GO -

LIBRARY (Supervisor - The Library Staff)

a. Clear main reading room -- move down stairway and out underneath peristyle - out through Draper basement. Line walls of corridor as far as Lost and Found Box.

b. Lower Library - remain in room along the walls underneath and between windows.

CO-OP & LOCKER ROOMS - Remain in rooms, line walls - avoid windows.

OLD DRAPER - (Supervisors-1st floor, Mr. Comi, 2nd floor, Dr. Phinney, 3rd floor, Dr. Standing)

1st floor - take positions in hallway along the walls.
2nd floor - take positions in hallway-except for Rooms 208, 209, 210, 211 - these classes move down west stairway to basement taking stations in lower peristyle as far as Husted Cafeteria.
3rd floor - take stations along corridor and Art Gallery. (overflow use center stair well)

NEW DRAPER (Supervisors-1st floor, Dr. Olson, 2nd floor, Dr. Mulkerne, 3rd floor, Dr. Cooper)

1st floor - use hallways and extend into Draper connecting corridor.
2nd floor - use hallways and Draper connecting corridor.
3rd floor - B 349 move to basement of New Draper taking stations along the walls. Other classrooms use hallway of 3rd floor

OVER

HUSTED (Supervisors-1st floor [illegible] Pryor, 2nd floor, Dr. Tiessen)

Both floors use hallways keeping stairways and exits clear.

CAFETERIA - Take positions along the walls not opposite windows.

RICHARDSON (Supervisors-1st floor, Dr. Adkins, 2nd floor, Dr. Rich, 3rd floor, Dr. Stokes)

All floors take stations along hallways using stairwells which lead down from the floor you are on to the one below for overflor.

PAGE HALL - If in Gym remain in Gym taking positions along walls under windows. If in auditorium--use stairwells up to balcony and down to gym, along wall between windows and stage.

* * * * * *

[illegible] DRILL BEFORE [illegible] April 1, 1959 [illegible]

TO: ALL FACULTY & STAFF

FROM: MR. COMI

TAKE COVER SIGNAL - 3 minute SIREN WAIL. (at about 1:30 p.m.) (Re-enforced by college bells, if possible).

ALL CLEAR - 3 minute STEADY SIREN (at about 1:40 p.m.) (Re-enforced by college bells, if possible).

NOTE - Floor supervisors do not report to switchboard unless having difficulty.

WHAT TO DO - Clear classrooms, and offices, close doors, avoid windows and open areas. Keep passageways clear and exit doors clear. Always leave room for emergency traffic to pass through.

WHERE TO GO -

LIBRARY (Supervisor - The Library Staff)

a. Clear main reading room - move down stairway and out underneath peristyle - out through Draper basement. Line walls of corridor as far as Lost and Found Box.

b. Lower Library - remain in room along the walls underneath and between window.

CO-OP & LOCKER ROOMS - Remain in rooms, line walls - avoid windows.

OLD DRAPER - (Supervisors - 1st floor, Mr. Comi, 2nd floor, Dr. Phinney, 3rd floor, Dr. Wheeler.
1st floor - take positions in hallway along the walls.
2nd floor - take positions in hallway-except for Rooms 208, 209, 210, 211 - these classes in 210-211 move down west stairway to basement taking stations in lower peristyle as far as Husted Cafeteria. The classes in 208 & 209 use center stairway and take stations in lower peristyle as far as Husted cafeteria.
3rd floor - take stations along corridor and Art Gallery (overflow use center stair well)

NEW DRAPER (Supervisors - 1st floor, Dr. Olson, 2nd floor, Dr. Mulkerne 3rd floor, Dr. Fairbank.

1st floor - use hallways and extend into Draper connecting corridor.
2nd floor - use hallways and Draper connecting corridor.
3rd floor - D 349 move to basement of New Draper taking stations along the walls. Other classrooms use hallway of 3rd floor.

Husted (Supervisors-1st floor, Mr. Pryor, 2nd floor, Dr. Long

Both floors use hallways keeping stairways and exits clear.

CAFETERIA - Take positions along the walls not opposite windows.

RICHARDSON (Supervisors-1st floor, Dr. Tibbets, 2nd floor, Dr. T. Rich, 3rd floor, Dr. C. Stokes.)

All floors take stations along hallways using stairwells which lead down from the floor you are on to the one below for overflow.

PAGE HALL - If [illegible] take [illegible] positions [illegible] walls [illegible]

Miss Wagner
[nd]

ATOMB BOMB - BREAK ATTACK
"Crouch and Cover"

Loan Assistant Hearing two short and one long bell
1 Shouts "Atomb Bomb. Crouch and Cover"
2 Warns offices with buzzer, two short, one long buzz
3 Herself crouches and covers

After ten seconds (count slowly "one thousand one, one thousand two, one thousand three" etc. up to one thousand ten)
1 Places book truck as barricade across door to peristyle
2 Directs traffic down narrow stairs repeating constantly "Single file. Keep left to lower Draper. Single file. Keep left to lower Draper" etc.
3 When main room is cleared, if alone on duty, checks conference rooms
4 Reports building clear by lifting telephone receiver and holding it open two seconds

Reference Assistant If in reading room
1 Shouts "Atomb Bomb. Crouch and Cover"
2 Herself crouches and covers

After ten seconds
1 (If no one covering reserve desk) Clears conference rooms
*2 Proceeds through reading room directing people (single line if possible) to basement stairs taking first the row of tables nearest the stairs and repeating over and over: "Single file. Down basement stairs"

If in stacks and aware of situation
1 Comes up half flight only
2 Remains outside of door (in hall under peristyle) directing students to lower Draper repeating: "Keep left to lower Draper. Take station either wall not opposite doors"

Reserve Assistant
1 Crouches and covers

After ten seconds
1 Clears conference rooms
2 If reference assistant is in sight, helps loan assistant at stairs
3 If reference assistant is not in sight, assumes *2 duty of reference assistant (see above)

Student and other patrons
1 Crouch and cover exposed skin

2 After ten seconds, and at directions of librarians, proceed to basement stairs, down stairs single file, keeping to left and thence to lower hall of Draper, there taking position along either wall not in line with doorways.

IN HAWLEY LIBRARY FORGET ABOUT SHADES

TO CALL HELP

Move receiver enough times to give a 3 or 4 flash signal and call will be answered

ALL CLEAR

Repeated long rings will denote ALL CLEAR RETURN TO WORK

WARNED ATTACK

Four short rings repeated three times (use same for buzzer warning of offices) Proceed as above except announce "Atomic Defense Drill Crouch & Cover" and start immediately clearing room, one row at a time, the rest remaining in crouch and cover position.