Untold Facts
ABOUT THE H-BOMB

Despite its great power, the biggest hell-weapon can't destroy the world.

By Martin Caidin

For the last four years Martin Caidin has been Atomic Warfare Specialist for the New York State Civil Defense Commission. He is considered a leading authority on the subjects of atomic and hydrogen bomb warfare and has dealt intimately with the defense prob-

Entrenched in open foxholes a mere three miles from ground zero, these Marines were not harmed in any way.

These Japanese fishermen were burned not by radiation, as was publicized, but by quicklime ash formed from coral by the heat of the big blast.

In an atomic or hydrogen bomb blast most of the radioactivity is carried into the stratosphere, dispersed over a wide area by the high winds.

lems against radiological, biological and chemical warfare.

Mr. Caidin visited Hiroshima and Nagasaki in the post-war years and has conferred with many leading Japanese military figures on what happened within these two cities immediately after the bombing.

He taught military science in the Air Force and has been writing on military, aviation, and similar topics since 1943. He is the author of four books.

EVER since the hydrogen bomb tests in the remote atolls of Bikini and Eniwetok, the warfare "experts" have been throwing Mr. and Mrs. Citizen—*you*—to the wolves. According to our so-called authorities, Mr. and Mrs. America are finished. So horrendous is the hydrogen bomb, insist these modern "Calamity Janes," that it is only a matter of time before our cities are wiped out, the country is enveloped in some form of weird, purplish, radioactive mist and the United States is reduced to a tribe of shell-shocked, gibbering survivors.

Never have so few people confused so many, as have the prophets of hell-bomb destruction bewildered the American citizenry. The man on the street has been dismissed with a cursory shrug of the journalistic hand as being inevitably linked with death, panic and chaos should this land ever be attacked. Our newspapers bulge with conflicting and contradictory statements, government and military officials beat the drums of civilization's end. Amidst all this journalistic palaver, the country is beset with information about the hydrogen bomb that is, to a great extent, *false or with little basis in fact.*

While I am fully cognizant of the immense power generated by atomic and hydrogen bomb explosions, I do *not* believe that our cities are doomed to inevitable extinction. I do believe that the American people deserve the opportunity to see both sides of the hydrogen bomb picture, to understand that contrary to what may be said elsewhere, it *is* possible to survive a hydrogen bomb explosion.

As Atomic Warfare Specialist for the New York State Civil Defense Commission for the past four years, I have been as close to the problems of mass atomic attack on our country as any other man. For four years I have worked with my colleagues on possible methods of attack and the effectiveness of every type of atomic weapon against our industrial and population centers. While we all have respect for the effectiveness of nuclear weapons, we have lived so long and so intimately with this threat that we are not over-awed by "the bomb," and we are able to evaluate properly the effects of atomic and hydrogen attack.

Let's look at what the American public is being fed by many magazines and newspapers. In referring to a hydrogen bomb of one thousand times the power of the Hiroshima explosion, *Look* magazine stated (April 21, 1953):

"An H-bomb would vaporize everything within a 5-mile radius and totally destroy everything within 10 miles. Buildings would crumble and burn 20 miles away. . ."

These are not the facts. The statement is untrue. There has been so much talk of vaporizing everything within and beyond the fireball that the public now assumes that for five miles in every direction from where the bomb explodes, nothing will be left but fiery gas.

To prove the falseness of this type of

As close as 1,000 ft. from the A-blast center in Hiroshima, these "American-type" buildings were left standing. Razed areas were gutted by fire.

Still less than 1,000 ft. from ground zero, the buildings shown shielded many people from death. Note trees standing, trolley operating as usual.

thinking, study carefully the official photographs released of the island of Elugelab, on which the hydrogen bomb of November 1952 was exploded. From the "cab" which contained the bomb, engineers constructed a concrete-and-plywood surface tunnel extending for two miles across the nearby islands of Teiter, Bogairikk and on to Bogon. The fireball from this explosion expanded to a diameter of three-and-a-quarter miles—almost completely enveloping the tunnel. Photographs of the islands after the explosion reveal the tunnel *still existing* on Teiter, Bogairikk, and Bogon!

Obviously, somebody is very wrong here. The fireball did *not* vaporize the tunnel.

Some years ago, in the test of the *Trinity* atomic bomb in 1945—the first atomic explosion—the country read that the awesome fireball of the explosion had completely vaporized everything about for hundreds of feet from the bomb. Yet the base of the tower on which the bomb was exploded, *100 feet from the very heart of the fireball,* remained after the explosion!

So many magazines and newspapers have stated that the island of Elugelab was vaporized or wiped off the face of the earth that the average reader is now convinced that a major island actually was reduced to incandescent vapor. For example, *Life* magazine (April 12, 1954) stated: *"The device which vaporized Elugelab. . ."*

An island was not vaporized. Elugelab itself was not an island. The truth of the matter was revealed in the March 31, 1954 statement by Rear Admiral Lewis L. Strauss, Atomic Energy Commission chairman:

"As a matter of fact, the task force dredged up enough sand and coral to build one of these so-called islands to have it where it was wanted most advantageously for shot No. 1. The impression that an entire atoll or even large islands have been destroyed in these tests is erroneous. It would be more accurate to say a large sandspit or reef."

As an excellent example of how this mistaken line of thinking can be extended into "scare" stories which make headline newspaper material, the *New York World-Telegram & Sun* (April 1, 1954) printed an artist's impression of Manhattan Island after a bombing. Manhattan is pictured as split in two by the explosion, a tremendous crater in its center, and with the Hudson and East Rivers joined.

Elugelab was an artificially built-up coral and sandspit. Manhattan is solid rock. Let the reader draw his own conclusions.

The same issue of the *World Telegram & Sun* states in headline form: "Blast Evaporates Island in Pacific And Numbs Belief," then continues in melodramatic fashion. "Elugelab, alas, is no more. In its place is a crater three-and-a-half miles in diameter and 175 feet deep, below the ocean surface."

The bomb blast was powerful, no doubt of that. It did produce a mile-wide, shallow crater. Why endow it with a destructive force, however, three-and-a-half times as great as was actually exhibited?

In referring to the total area of damage, many periodicals have assumed tremendous areas would be obliterated, vaporized, crushed and so on. For example:

"The limit of incendiary action would cover a diameter of 50 miles, or a total of almost 2,000 square miles." (*N. Y. Times,* April 1, 1954.)

"An H-bomb would . . . totally destroy

Here is a plywood tube running from Elugelab for two miles to Bogon, most of it within fireball area.

everything within 10 miles." (*Look,* April 21, 1953.)

Now the hydrogen bomb, whether it be a five megaton bomb (1952) or a 12-14 megaton bomb (1954), is going to do a hell of a lot of damage. But too many people have been tossing "total obliteration" and "absolute destruction" and similar phrases about with too little understanding of these descriptions.

If we were to believe everything that is being reported of the hydrogen bomb blasts then any ship 10 miles off Eniwetok in 1952 should have been destroyed, or at the least severely battered. The bomb control ship, *Estes,* was exactly 10 miles off the shot site and came through the explosion without damage. Construction quarters for the bomb site crews on Eniwetok, 25 miles away, were not reported to have suffered damage.

In other words, there is inadequate understanding of these phrases denoting bomb damage. This exact situation prevailed during the hullabaloo about the atomic bomb. Today, the energy yield of the bomb is greater, devastation extends over a wider area, more people will be killed, but the damage is essentially of the same character. Only the extent of damage has changed and this not as much as we would sometimes be asked to believe.

We can best understand our position in relation to the hydrogen bomb by going back in time to that point when the country shivered under its blankets from A-bomb jitters. Cities held frantic air raid drills, speech makers warned of "civilization's end from a rain of atom bombs," some people actually quit their cities. Finally, after much senseless uproar, we came to understand the actual extent and limitations of an atomic explosion.

In 1946, for example, the greater majority of our newspapers and magazines stated that the atom-bombed cities of Hiroshima and Nagasaki would, because of radioactivity, be uninhabitable for at least 80 years. And people believed this was so. Yet, Japanese men and women entered the cities within minutes of the explosion with absolutely no harm. Today, both cities are largely rebuilt and boast thriving industries and population.

I saw headlines years ago proclaiming that any person caught within a half-mile of an atomic explosion didn't have a chance of surviving the attack, that *everybody* in the area would be dead. I wonder where people ever obtain these idiotic untruths, for they breed nothing but fear and panic.

Let's return to Nagasaki, which was hit by a plutonium bomb, more powerful than the weapon that devastated Hiroshima. Exploding 1,700 feet above the city, the bomb blew down houses four miles away and started flash fires more than two miles distant from the fireball. On these two bland statements, then, one could assume that everything within two miles of the fireball was set aflame and that all buildings within four miles were flattened.

Half-truths, however, are exceedingly easy to come by. True, an isolated finger of the blast swept down a ravine and collapsed a flimsy, wooden, Army barracks four miles from the explosion. Other barracks, however, not more than ten feet away, remained standing and with unbroken window panes! Windows were

shattered 12 miles from the explosion in some houses. Yet other buildings only a half-mile from the bomb and protected by low hills were untouched!

The answer is that the blast is spotty. It is freakish, disposed to skitter about by the dictates of atmospheric conditions and terrain. It follows no even pattern. While buildings a half-mile from the fireball remain untouched, other buildings four miles away collapse. This should not be accepted as a flat indication—as too many people did—that the atomic blast at Nagasaki destroyed every building up to four miles from ground zero.

The heat of the Nagasaki bomb fireball exceeded 70,000,000 degrees Centigrade. On the ground directly beneath the fireball, 1,200 feet away, the temperature reached 4,000 degrees Centigrade. One could assume, therefore, that since this same heat started fires two miles away, everything within the area was set aflame.

Such an assumption is dead wrong. The heat flash did start fires, *in highly inflammable substances which were directly exposed to the fireball.* The heat lasted for one to three seconds, and then was gone. Most of the flash fires were blown out by the following blast wave. The greatest source of fire was the number of overturned stoves, electrical short circuits, etc., which result from any heavy bombing, atomic or otherwise. The uncontrolled spread of this fire after the bombing—because the pitiful fire department was helpless—is what destroyed 40 per cent of Nagasaki and most of Hiroshima.

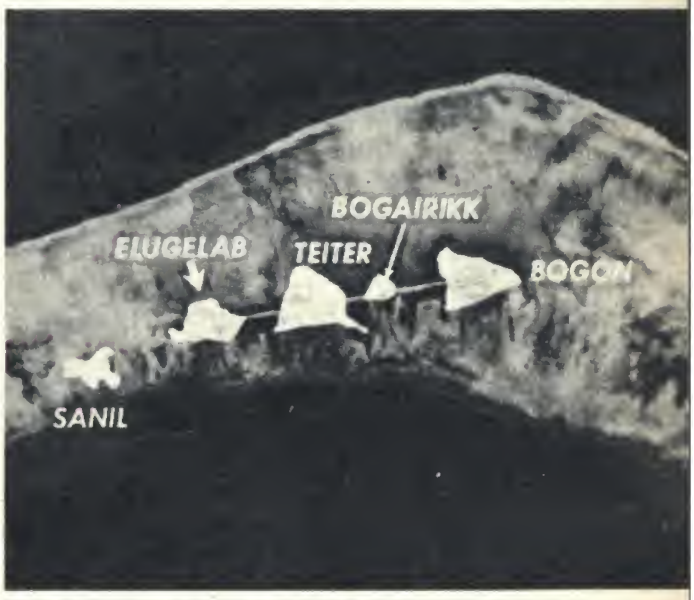
The apocryphal experts would have you believe that any person within a half-mile of even the Hiroshima-type bomb stands no chance of survival, that even up to one mile from the explosion there is only one chance in ten of survival. This is pure rot.

In Hiroshima, most of the occupants of the Hiroshima Press building, three city blocks from ground zero, survived the attack. Within one mile of the explosion, almost all (about 50) of the concrete buildings remained standing. Of the steel and concrete bridges in the city, only one was destroyed.

Hiroshima and Nagasaki were tinderbox cities, built of flimsy, highly-inflammable homes and other structures. The cities had only a fraction of the fire-fighting equipment and water pressure available to our cities and they were caught unexpectedly by the bomb, with their populations exposed to the worst effects of the attack.

In Hiroshima, more than one-half of the people a mile [*Continued on page* 200]

Man-made "island" of Elugelab is seen just before the world's first H-bomb was set off in the Fall of 1952. Small, black building housed bomb.



This is an aerial view of the test area before explosion. The plywood tube can be seen running from Elugelab past Teiter, Bogairikk, to Bogon.

After the blast most of the tube still runs from Teiter to Bogon. Rest was not "vaporized"—it merely sunk when the soft sand under it shifted.

[*Continued from page* 51]

from ground zero survived the bombing. In Nagasaki, 69 out of every 100 persons at that same distance lived! Most of the deaths, it must be remembered, were caused by fire *after* the attack.

Nagasaki is a hilly city and during the war it was dotted with impromptu shelters dug into the sides of hills. Four hundred people were crowded into one of these shelters, only 100 yards from the point directly beneath the fireball. *Every single person survived*—even though the temperature at the entrance to the shelter was 4,000 degrees Centigrade, the blast smashed into the ground at 1,000 miles per hour and the area was flooded with nuclear radiation.

The heat was of too short a duration to affect the sheltered people (it did not burn telephone poles standing outside the shelter), the blast was absorbed and reflected by the earth and the dirt over the shelter shielded the people within against radiation.

Crude timber shelters covered with four feet of ordinary earth remained intact 100 yards from ground zero and provided safe cover for their occupants.

Telephone poles, trees and other inflammable substances remained standing and unburned in the ground zero area of both atom bomb attacks. Obviously the brief duration of the heat wave was insufficient to do more than char the outer wood surface.

This effect is identical in the hydrogen bomb explosion. The heat is more intense, lasts only slightly longer and reaches out over a greater distance, just as the Nagasaki blast was more effective in this respect than the Hiroshima explosion.

Even the hydrogen bomb heat, however, can set aflame only those inflammable substances in a direct line of sight with the fireball. The heat essentially is of short duration, and its effectiveness can be drastically reduced because of smoke, fog, haze, smog and rain.

And now we come to the "super" effects of the "super" bombs. During test explosions carried out in Nevada in 1953, a number of newspapers took special notice of the fact that one particularly powerful explosion had shattered plate glass windows 78 miles away. This, supposedly, attested to the awesome power of the new bomb.

What those same newspapers didn't know—or chose to disregard—was that the explosion of the world's first atomic bomb, on July 16, 1945, at Alamogordo, shattered plate glass windows in Silver City, 100 miles distant.

In both cases the distant effect of the blast resulted from a freakish extension of the shock wave due to unusual atmospheric conditions.

Much ado also has been made of the height of the mushroom pillar of the hydrogen bomb explosions and, indeed, these have assumed awesome proportions. The *Ivy* shot cloud reached a height of 25 miles and extended to 100 miles in diameter; the March 1st shot exceeded this figure to climb 32 miles above the earth and to spread out horizontally over a diameter of 150 miles.

When, however, we get down to cases, the dimensions of the mushroom pillar, no matter how spectacular, have no effect upon a stricken city. The dangerous residual radioactive particles following an air burst are sucked into the vortex of the ascending cloud and therefore little concern a city struggling with the effects of blast and fire.

Even the height of the mushroom pillar depends upon local atmospheric conditions. The first atomic bomb sent its smoke cloud to 41,000 feet, the Nagasaki explosion cloud reached more than 60,000 feet above the ground. More powerful bombs exploded in subsequent tests produced mushroom pillars four and five miles smaller in height than the Nagasaki bomb. Moral: a lot of smoke is little indication of bomb effectiveness.

Even such distinguished individuals as William L. Laurence, two-time Pulitzer Prize winner, have joined the parade of those extolling the immense destructive ability of the bomb, beyond its factual strength. Mr. Laurence, for whom I have the highest personal regard, referred to the 10 megaton bomb and stated (*Look*, April 21, 1953):

"For as much as 35 miles in every direction, irresistible fires would burst forth; everything that was inflammable would roar into flames simultaneously. Then the firestorms would come. The roaring heat would churn the atmosphere into fury, and great hurricanes would be set up . . ."

We have already discussed flash fires. Now let us understand clearly a few things about mass fires. *Firestorm* refers to a particular fire phenomena and results from a situation of particular circumstances. In a firestorm all the flames of a great mass fire burn toward a common center; it is the most intense fire known but eventually burns itself out without undue spread. A firestorm may be created in a city where building density exceeds 22-27 per cent over an area of at least one to two square miles, where there is no high ground wind, where fires break out simultaneously and are not subdued and where structures burn quickly and easily. Only under

these conditions is a firestorm possible.

It has nothing to do with atomic or hydrogen bomb explosions excepting that these two weapons, like others, do start numerous fires. There was a firestorm at Hiroshima where conditions were right for the storm to begin. There was no firestorm at Nagasaki. Long before the atomic bomb ever entered the scene of war, firestorms of devastating nature raged in Hamburg, Dusseldorf, Essen and other German and Japanese cities.

Incendiary bombing proved far more destructive than did atomic bombing in Japan. The atom bomb attacks contributed less than three per cent to the destruction already visited upon Japan. Sixty-six thousand people died in Hiroshima; 110,000 died one night in Tokyo and perhaps as many people succumbed in Essen one evening from a massive British saturation raid.

As far as *you*—Mr. and Mrs. Citizen—are concerned, for your own peace of mind, you should understand these basic facts about the world's most powerful weapon.

The hydrogen bomb, even more so than the atomic bomb, is a terrible weapon of devastation. Many factors influence the use and the effective delivery on target of such bombs, all of which are decidedly not to the advantage of the attacker.

The bomb, despite its enormous energy yield, has basic limitations. It is not an all-consuming weapon which renders shelters and civil defense operations useless. True, the central area of devastation from an H-bomb explosion is greater than that of the atomic bomb but it is still limited, and to the extent that our cities cannot be presumed to have lost their place in our way of life.

All attacking enemy planes will not get through. The better our aerial and missile defenses, the better our chances are of reducing the number of bombs which will strike our cities.

Irresponsible evaluation of a weapon sufficiently devastating so that it requires no further assistance from careless reporting sources can lead only to a lack of confidence in our ability to survive as a nation of free people.

Something should be done about it. The half-measures, indecision and innumerable speeches which characterize the Federal Civil Defense Administration mean only one thing in event of attack—that millions of people who will die will die needlessly because their protection was not provided for while there yet was time.

Think about it. More than that, do something about it. Inquire of your local officials why your town is inadequately prepared.

After all—it's *your* life. •