ATOMIC ENERGY

Bikini Breath of Death

Lethal fog of radioactive water droplets and fission byproducts lingered at Bikini long after subsurface explosion, and left complete death in its wake.

By DANIEL WILKES
Science Service Crossroads Correspondent

➤ THE BREATH of Death, even more than the shattering of ships, was the most awesome thing about the second atom bomb's subsurface burst at Bikini.

It is already being suggested that newer capital ships might have survived the underwater shock that sank the old Saratoga and the older Arkansas and Nagato, but if they did remain afloat they would surely be manned only by corpses.

That clinging, persistent, lethal fog of radioactive water droplets and fission byproducts that the bomb spewed into the air over the whole target area on Baker Day, drenching every ship in the array, could hardly have left anyone alive on board when it finally did move slowly away, like a legendary monster reluctantly leaving its prey.

Anybody on deck of a ship drenched with this deadly fog would be a "goner," Vice-Adm. W. H. P. Blandy, commander of Joint Task Force One, commented. And the ventilating systems of all present-type ships would most probably spread it all through their interior spaces before the blowers could be shut down.

The Breath of Death seems to have taken Navy biological experimenters somewhat off their guard. Capt. R. H. Draeger, in charge of the goat, pig and white-rat details, stated before the test that only 20 pigs would be placed on two ships, and 200 mice on four ships, as compared with more than 3,000 animals that were exposed to the aerial blast on July 1. Had anything like the long-hovering, killing mist been anticipated, it may be taken for granted that a larger. number of experimental animals would have been used for the second test.

Even after the cloud itself had slowly moved off, a large part of Bikini lagoon remained too "hot" with radioactivity to permit anything but the quickest dashes into the contaminated area, under carefully guarded conditions.

Whereas few fish if any were killed by the first blast, this time there were plenty of them. Probably they succumbed to the same shock wave that sank the ships, though lethal radiological effects may help to account for them.

Navy Research Began Early

➤ THE STORY of the devastation in the lagoon at Bikini began more than two years ago in early 1944, before the first atomic bomb was exploded.

These tests are based, in part, on tactics considered for use against Japanese naval power, Rear Adm. W. S. Parsons, deputy task force commander for technical direction, revealed as the damage from the underwater blast July 24 was surveyed.

"Late in 1943 and early in 1944 we did not own bases from which we could attack Japan," Adm. Parsons explained, adding that Truk was a primary target.

"For a few months in 1944 until Truk ceased to be a threat, some consideration was given the atomic bomb, which was still in the development stage, for use against the Japanese navy.

"After we went duck shooting through the Truk area in 1944, the Japanese Navy ceased to be a threat, and we stopped considering the bomb for use against it," Adm. Parsons disclosed.

Maj. Gen. Leslie R. Groves of the Manhattan District and others were in on the calculations at that time, he reported.

"Our memory of the earlier considerations served as a background when we began laying out these tests," the deputy task force commander said, adding:

"I must say that our ideas in 1943 and 1944 on naval atomic warfare were not fully developed.

"These tests at Bikini represent a much greater crystallization of thought on the matter," Adm. Parsons declared.

He pointed out that the job of developing the atomic bomb went into high gear late in 1942. At that time, and for some time after, the United States was fighting a defensive war. Therefore, he said, it was necessary to give thought to using it in a manner which would at that time most benefit American tactics—against Japanese naval power.

Once that threat was eliminated, the primary target became Japanese cities, and all effort was given to developing tactics for such targets as Hiroshima and Nagasaki.

Scientists are getting their first really good chance to get full information about what atom bombs can do as a result of the two tests at Bikini, Adm. Parsons pointed out.

This is because there was plenty of time to plan out the whole operation and set up instruments and recording cameras exactly as wanted. There will also be time enough to evaluate, compute and compare.

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The test at Alamagordo, in March, 1945, could not be called a test in the full scientific sense, because it had to be conducted under wartime pressure, which permitted no time for obtaining full instrumental and photographic data.

Adm. Parsons was in charge of Naval activities at the atomic bomb factory at Los Alamos, N. Mex., where the weapon was developed.

Science News Letter, August 10, 1946

PHYSICS

Atomic Age Up to Now

The first anniversary of the bombing of Hiroshima records a brief but portentous history. Great strides include shipping of isotopes for peacetime research.

➤ THE WORLD'S new era, the Atomic Age, has had a very brief history so far, but one packed with tense drama. First intimation that most people had that the dreamed-of possibility of using atomic energy had been realized came just a year ago. The Japanese city of Hiroshima was blotted out by a single air-borne bomb, hastening the end of the second World War.

The first anniversary of this epoch-marking catastrophe was heralded only a few days ago by two less spectacular events which may, however, prove even more significant in the longer perspective of history. First was the signing of the atomic energy control bill by President Truman on Aug. 1, putting the power over fissionable materials and their uses definitely into the hands of a civilian commission. Second was the shipment from Oak Ridge, Tenn., of nuclear fission products intended for peacetime scientific purposes. These steps should mark the turning of atomic power from the ways of war to the paths of peace.

Although Aug. 6 will probably be observed hereafter as the anniversary day of beginning of the Atomic Age, actually that age had a dawn running back into the last few years of the nineteenth century, when X-rays and related phenomena were discovered in European laboratories, followed shortly by the demonstration of radioactivity and the discovery of the element radium by the Curies.

A much condensed chronology of the later dates in atomic energy history includes at least the following:

1939, Jan. 26: American physicists first heard of European experiments showing that slow-neutron bombardment would split nuclei of a uranium isotope, with release of energy.

1942, Dec. 2: First self-maintaining nuclear chain reaction was initiated in a uranium-graphite pile at the University of Chicago.

1945, July 16: First atomic explosion engineered by man blasted the New Mexico desert. Cost of project, to this date, $2,000,000,000.

1945, Aug. 6: First military use of atomic bomb resulted in destruction of Hiroshima, Japan.

1945, Aug. 11: Second atomic bomb exploded over Nagasaki, Japan.

1946, June 30: First atomic bomb exploded in air over naval vessels at Bikini atoll, sinking five and severely damaging many more.

1946, July 24: Second (subsurface) atom-bomb explosion at Bikini sank three capital ships and several submarines, and damaged other vessels.

1946, Aug. 1: Civilian control of atomic energy becomes law of the land in U. S.

1946, Aug. 2: First shipment of fission products for scientific research made from Oak Ridge, Tenn.

Science News Letter, August 10, 1946

METALLURGY

Slag, Useful By-Product

➤ OUT OF the blast furnace comes not only iron for America's large ships and high buildings, but slag, constructing material for highways, bridges, and airports. About one ton of slag is produced along with every two tons of iron.

Slag is made in the Ohio valley, along the shores of the Great Lakes, by the Chesapeake and in the folds of the mighty Appalachians. It is used in almost every state east of the Mississippi, from Canada to the Gulf.

During the past four decades over 100,000,000 tons of slag have been used in various types of construction. Approximately 60% of this was used in building and maintaining highways in 23 states. Another 25% was used as ballast by railroads.

Molten slag floats on top of molten iron because it is lighter. Either of the two may be drawn off separately. When withdrawn from the furnace, the dissolved gases tend to escape from the molten slag. Some of the bubbles are trapped, however, and generate the pore structure in the solidified slag.

These cells or bubbles within the slag are near-vacuum. They expand the volume of the slag materially, decreasing its weight, yet its structural strength is reduced but slightly. Some slag today is specially treated so it will have a large number of air pockets.

Most of the mineral wool used for insulating is made from slag. Melted in a small furnace or cupola, the slag is run down small grooves where jets of air or steam under high pressure shred it into small blobs. The very speed of these tiny bullets forces the material in them to develop into tails of very fine threads which in turn use up the mass of slag. Mineral slag has only a tiny "shot" head attached to a long fiber tail.

One of the newest uses for slag is in neutralizing soil that is too acid. Sometimes used in place of lime, agricultural slag is made by crushing pieces of slag to extreme fineness.

Science News Letter, August 10, 1946

ANIMAL NUTRITION

Cattle Thrive on Phosphate Drink

➤ CATTLE on the King Ranch in southern Texas have been getting a phosphate drink and thriving on it. Phosphate salts are added to the drinking water to make up for insufficient supplies in the native vegetation in experiments conducted by the U. S. Department of Agriculture and Texas scientists. Besides being convenient for cattle owners, putting the phosphates in the drinking water enables each animal to get its supply in a soluble form readily assimilated.

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