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Port Chicago Naval Magazine:

Contra Costa County, California, 30 miles NE of San Francisco on the southern shore of Suisun Bay; authorized December 9, 1941 by Secretary of the Navy Frank Knox. Ammunition loading aboard civilian deep water transports destined for the Pacific Theater of war commenced November 1942.

The Navy facility was identified by the nearest United States Post Office and thus designated Port Chicago by reference to the small rural town that lay 1.5 miles inland from the magazine at the base of a range of low hills south of the town. Beyond the hills lay a fertile expanse of small and picturesquely lovely small California farms and orchards that since World War II have been entirely transformed to accommodate the present

population of one million, of whom 120,000 live in the city of Concord.

The Port Chicago magazine was served by the Santa Fe, Southern Pacific and Western Pacific railroads by which the flow of wartime munitions to the magazine could move easily from manufacturing plants across the country and, for example, from the remote and very large Navy munitions depot at Hawthorne, Nevada.

Ship loading operations at the naval magazine pier were conducted by 1,000 African-American enlisted Navy personnel in 24-hour operations. The explosion of the Liberty ship *E.A. Bryan* at the magazine pier at 10:30 the evening of 17 July 1944 resulted in the immediate death of 320 men on and about the exploded ship, injury of several hundred sailors on the base, and injury of civilians (including women and children) on the base and in the surrounding territory. Destruction and damage at the base facilities were extensive, but the base was rapidly reconstructed and returned to service.

Fissionable and hardware components of the atomic bomb detonated in combat 6 August 1945 at Hiroshima, Japan, were transshipped through the Port Chicago Naval Magazine late in July 1945. The base was a munitions transshipment facility operated by the Navy with major contributions to the conduct of the Korean and Vietnamese wars and was the site of contentious antiwar protests and antinuclear demonstrations during the 1960s, 70s and 80s. The base since World War II, through the 1980s, is alleged to have been the principal West coast transshipment, storage and repair facility for the Navy's nuclear weapons.

In 1957 the Port Chicago Naval Magazine site was renamed U.S. Naval Ammunition Depot, Concord. In 1963 the base was redesignated Naval Weapons Station, Concord (CNWS). During 1997-1999 CNWS was transferred from the Navy to the U.S. Army and presently (16 April 2009) is the Army's Military Ocean Terminal Concord (MOTCO) operated by the 834th Transportation Battalion.

In November 2005 the Base Realignment and Closure (BRAC)

Commission announced that the 5,000 acres of the facility's Inland area was approved for closure. The commission retained the 7,000 acres of the facility's Tidal Area to remain in operation as a port under the command of the Army. The BRAC legislation stipulated that the Navy would retain property ownership of the Inland Area, but would have to make some provision for the Army to acquire a portion of the Inland Area to support its port operations in the Tidal Area.

In 2006, the Department of Defense designated the Concord City Council to serve as the Local Reuse Authority (LRA) for the Inland area. The LRA is the one point of contact negotiating with the Department of Defense and the single community point of contact for all matters relating to the closure of the Naval Weapons Station. The LRA has launched a three-phase, multi-year process to develop a Reuse Plan for the Inland base property, which see at:

http://www.concordreuseproject.org/about/index.htm

In consideration of the casualties of the 1944 explosion, the important role of the base during World War II and the national historical importance of the explosion, the Port Chicago Naval Magazine National Memorial was established by Congressional enactment (Public Law 102-562; 102d Congress) 28 October 1992 and signed into law by President George Bush. The National Memorial was dedicated by the National Park Service on the 50th anniversary of the explosion 17 July 1994.

Port Chicago Naval Mutiny:

In the aftermath of the 17 July 1944 explosion 300 uninjured African-American enlisted Navy men on the base *en masse* refused to comply when ordered to return to their assigned duty loading ammunition into the holds of cargo ships destined for the Pacific Theater of war. Although the Port Chicago Magazine ship loading pier had been destroyed in the explosion, the nearby Mare Island Naval Magazine and Shipyard piers were operational; to that facility the men were ordered to duty, which order they refused.

Following confinement below decks on a barge at Mare Island the assembled men were addressed by the Commandant of the 12 Naval District (San Francisco) and instructed that they were subject to summary execution if they remained in defiance. Two hundred seventy-five men then agreed to return to duty as ordered and in summary courts-martial were convicted of insubordination and other offenses. Fifty of the men remained obdurate and were charged with mutiny-in-wartime and convicted on that charge in formal Navy court-martial proceedings.

The Port Chicago mutiny is the largest mutiny in United States military history. Various legal reviews of the proceedings during 55 years sustained the convictions. On December 23, 1999, President William Jefferson Clinton granted presidential pardon to one of the two then known surviving Port Chicago mutineers, Mr. Freddie Meeks. President Clinton found that Mr. Meeks had rehabilitated himself during the years since 1944.

Isotope:

One of two or more atoms of an atomic element, the nuclei of which have the same number of protons but differ in the number of neutrons; the variation of neutron number among the different nuclei of isotopes of the same element distinguish each isotope by a different atomic mass. In chemical reactions, all isotopes of the same element behave identically.

Uranium:

Heavy silvery-white metallic element, radioactive, easily oxidized; atomic number 92, atomic weight 238.03, melting point 1,132°C, boiling point 3,818°C. Named in reference to the planet Uranus, and having 14 known isotopes of which U^{238} is the most abundant in nature. The peculiar nuclear properties of the U^{238} isotope determined that a fission chain reaction in U^{238} was, for practical purposes, unrealizable during World War II. In the isotope U^{235}, however, conditions are favorable to establish a divergent nuclear fission chain

reaction.

U235:

Uranium isotope with mass number 235 and half-life 7.13 X 10^8 years, fissionable with slow "thermal" energy neutrons or high energy neutrons and capable in a supercritical mass of sustaining a nuclear fission chain reaction that can proceed explosively with appropriate mechanical arrangements.

Highly U235 Enriched Uranium:

Natural uranium modified by isotope separation (concentration) to increase the 0.7% occurrence of the U^{235} isotope to 93%; highly enriched uranium was employed as the fissionable material for the Mark I weapon detonated in combat at Hiroshima; highly enriched uranium contrasts with the slightly enriched uranium (approximately 20% U^{235}) employed in the Mark II weapon which was proof fired at the Port Chicago Naval Magazine 17 July 1944.

Plutonium:

Naturally radioactive, silvery metallic transuranic element, occurring in natural uranium ores in negligible quantity and produced artificially by neutron bombardment of the uranium isotope U^{238}; fifteen isotopes with masses ranging from 232 to 246 and half-lives from 20 minutes to 76 million years; used, especially the highly fissionable isotope Pu^{239}, as a nuclear reactor fuel and in nuclear fission weapons; atomic number 94, melting point 639.5°C, boiling point 3,235°C. Discovered shortly after the element neptunium, and named by analogy after the planet Pluto, which is more distant from the sun than Neptune. The highly fissionable plutonium isotope Pu^{239} was employed in the Mark IV weapon tested in the New Mexico desert 16 July 1945, and detonated in combat at Nagasaki 9 August 1945.

Isotope Separation:

Isolation of one isotope from an element in which it naturally occurs, or concentration of one isotope by the removal of unwanted isotopes from an element in which they occur. Since isotopes of the same element behave identically in chemical reactions, World War II separation of uranium isotopes was accomplished by mechanical methods, which depended on the different atomic weight of each isotope as determined by the number of neutrons in the nucleus of each isotope.

Liquid thermal diffusion uranium isotope separation:

The isotopes of natural uranium prepared in liquid and heated in a vertical column will separate by the ensuing rise, or diffusion, of the lighter isotopes to the top of the column and the settling of the heavier isotopes to the bottom; in this system the lighter, fissionable U^{235} isotope accumulates at the top of the column and the heavier, non-fissionable U^{238} isotope accumulates at the bottom.

Many such columns connected in series as a cascade process the partially U^{235} separated material drawn from the top of each preceding column to the next, so that the separation and accumulation of U^{235} is gradually increased in each column as the liquid material passes through the cascade. The process was developed by Philip H. Abelson, first at the United States Naval Research Laboratory. During the first six months of 1943 Abelson had produced the first separated U^{235} in weapon quantity.

Nuclear fission chain reaction:

Self-replicating (divergent) nuclear reaction in which an atomic nucleus is split into fragments, usually two fragments of comparable mass, by the impingement of an energetic free moving neutron, with the release of one or more neutrons from the split nucleus, which may sustain or multiply the fission process in U^{235} or plutonium; the fission of each nucleus evolves 100 million to several hundred million electron volts of energy.

Mark I:

Highly U^{235} enriched uranium gun assembly atomic bomb detonated in combat at Hiroshima, Japan, 6 August 1945; reported not to have been proof fired with active fissionable material prior to combat use. Also known as Little Boy.

Mark II:

Autocatalytic uranium hydride lateral implosion experimental device. A previously undisclosed Manhattan Project cylindrical configuration atomic bomb design and technology that was susceptible to use with either a plutonium or slightly (20%) U^{235} enriched active. The cylindrical design of the Mark II was the precursor of the spherical Mark III and Mark IV weapon designs.

Mark II, was a tactical weapon. The Mark II was certified 4 July 1944 to the Joint Chiefs of Staff for the purposes of operational planning, subject to the necessity of one proof firing before the Mark II could be available for combat use. The nominal energy yield of the Mark II was 1,000 tons (1 kt) TNT equivalent. The 17 July 1944 Port Chicago explosion, which provided field-scale proof of the Mark II weapon, determined the future development of Mark II.

In consequence of the Port Chicago proof of the Mark II, Mark II was “put on the shelf” 17 August 1944 with agreement at the Manhattan Project Los Alamos Laboratories that the Mark II could be “taken off the shelf” and developed for combat use in 3 or 4 months time if required. Chief of Staff General George C. Marshall planned the use of nine Mark II weapons, each with an anticipated 1 kt energy yield, to prepare Japanese beaches and near-shore inland areas for an Allied invasion of the Japanese home islands if that invasion had been required. Two postwar experimental detonations of uranium hydride Mark II were conducted at the Nevada test site: Ruth and Ray of the 1953 Upshot-Knothole series.

Mark III:

First prototype spherical implosion atomic bomb design and technology, susceptible to use with highly U^{235} enriched uranium or plutonium. The Mark III did not use focused implosion technology, as did the subsequent design of the Mark IV. Mark III was not proof fired with active material, and was eliminated from combat development after the Mark II was successfully proof fired at Port Chicago, and with confidence among Los Alamos weapon scientists that the markedly more efficient Mark IV spherical bomb design, utilizing focused implosion technology, could be successfully developed before the end of WW II.

Mark IV:

Improved the efficiency of the Mark III spherical implosion design by application of focused implosion technology. Mark IV was susceptible to use with highly U^{235} enriched uranium or plutonium; with plutonium the Mark IV was proof fired at Trinity site, New Mexico, 16 July 1945 and detonated with a plutonium active in combat at Nagasaki, Japan, 9 August 1945. Also known as Fat Man.

Atomic Bomb Military Policy Committee:

Committee appointed by President Franklin Delano Roosevelt, consisting of three members and one alternate. Carnegie Institution President Vannevar Bush in Washington, DC, was the committee's civilian member and chairman; Harvard University President James B. Conant was the committee's one appointed alternate member and he was the committee's alternate chairman; Rear Admiral William R. Purnell, USN, was the committee's Navy member; Major General Wilhelm D. Styer, USA, was the committee's Army member.

On September 23, 1942 the Military Policy Committee appointed Brigadier General Leslie R. Groves, USA, as the committee's executive officer. Constituted as above, the committee and General Groves served through World War II.

President Roosevelt had also designated Vice President Henry A. Wallace, Secretary of War Henry L. Stimson, and Army Chief of Staff General George C. Marshall to have determination of general policy in the atomic bomb project pertaining to military use of the atomic bombs during WW II. These three men were designated the President's Top Policy Group.

Groves, General Leslie R., USA:

Commanding Officer, Manhattan Engineer District, United States Army Corps of Engineers; Executive Officer, President Roosevelt's atomic bomb Military Policy Committee.

Conant, James B.:

President Harvard University; principal science advisor to General Groves; Atomic Bomb Military Policy Committee alternate committee member and alternate committee chairman; provided Military Policy Committee liaison with Manhattan Project Los Alamos Laboratories via Los Alamos Laboratories Director J. Robert Oppenheimer and Military Policy Committee Executive Officer General Groves.

Parsons, Rear Admiral William Sterling, USN:

As a newly appointed Navy captain, he was assigned duty at Los Alamos, May 1943, as director of the Ordnance Division. A year later, on 1 August 1944, Captain Parsons was named Associate Director, Los Alamos Laboratories. He was the bomb commander (weaponeer) on the Hiroshima mission, 6 August 1945.

In the chain of Navy command he reported to Rear Admiral Purnell, the Navy's Military Policy Committee member. He was the technical director at the postwar Bikini and Eniwitok atomic bomb tests. After WW II, Captain Parsons was elevated to the rank of Rear Admiral. See: Christman, Albert. *Target Hiroshima, Deak Parsons and the Creation of the Atomic*

Bomb, Annapolis, MD: Naval Institute Press, 1998.

Reynolds, George T.:

Professor of Physics Emeritus, Princeton University; Manhattan Project Los Alamos Laboratories scientist as Ensign, United States Naval Reserve. With Captain Parsons and Maurice M. Shapiro, Ph.D., conducted extensive onsite investigations of the physical effects of the Port Chicago explosion in the immediate aftermath, which in comprehensive analyses were reported in several hundred pages transmitted by Captain Parsons to Military Policy Committee member Rear Admiral Purnell between July 27, 1944 and November 1944.

Shapiro, Maurice M.:

Maurice Mandel Shapiro, Ph.D., retired as Chief Scientist Emeritus Laboratory for Cosmic Physics, United States Naval Research Laboratory. He was a civilian Manhattan Project scientist at Los Alamos Laboratories who, with Captain Parsons and Ensign Reynolds, conducted extensive onsite investigations of the physical effects of the Port Chicago explosion in the immediate aftermath, which were reported in several hundred pages of analysis transmitted by Captain Parsons to Military Policy Committee member Rear Admiral Purnell between July 27, 1944 and November 1944.

Ashworth, Vice Admiral Frederick L., USN:

Career associate, friend and confidant of Captain Parsons, he was assigned duty at Los Alamos Laboratories in autumn 1944 on the recommendations of Rear Admiral Purnell and Captain Parsons, to whom then-Commander Ashworth reported. Commander Ashworth was the bomb commander on the Nagasaki mission, 9 August 1945; he participated in the postwar Bikini and Eniwitok atomic bomb tests as then Rear Admiral Parsons' executive officer; subsequent to his assignment as Commander of the U.S. 6th Fleet, Vice Admiral Ashworth retired from the Navy.

Oppenheimer, J. Robert:

Director Los Alamos Manhattan Project Laboratories.

"History of 10,000 ton gadget":

The “History” is a large, one-page document composed in typescript and manuscript that was purloined during autumn 1944 from the Manhattan Project Los Alamos Laboratories by Santa Fe, New Mexico, resident Paul Masters, who was a photographic technician employed at the Laboratories during WW II.

The “History” was recovered by this author among a variety of mid-1940s photographic supplies that Paul Masters had donated to the Santa Fe Christ Evangelical Lutheran church in the spring of 1980. His donated items, including the mid-1940s vintage photographic supplies and the “History” were mixed into the accumulation of goods offered for sale at the church’s spring 1980 rummage sale.

The “History” is a mathematical model that forecasts the progression and effects of the explosion of the Mark IV weapon that would be detonated 16 July 1945 in New Mexico at Trinity site. The “History” was composed in late autumn 1944 by Los Alamos civilian scientists Joseph O. Hirschfelder and William G. Penney. The “History” provides general design specifications of the Mark IV and in the bottom line concludes: “Ball of fire mushroom out at 18,000' in typical Port Chicago fashion.”

This author first published the “History” in spring 1982. Two years later this author formally donated the “History of 10,000 ton gadget” to Los Alamos National Laboratory Archives. The “History” reproduced in this work is reported by Los Alamos National Archives staff to be one of several documents of the same title held by the Archives that are progressively developed renditions of “History.”