

Notes on the "Trinity" Test

held at Alamogordo bombing range

125 miles South East of Albuquerque N. M.

5:30 A.M. Monday July 16

~~Secret~~

~~RESTRICTED DATA~~

This document contains restricted data as defined in the Atomic Energy Act of 1954. No transmission or disclosure of its contents in any manner to an unauthorized person is prohibited.

V. Bush, Gen. Groves & J.B.C. arrived at the Base Camp located 10 miles from the bomb at about 8 PM Sunday evening. After dinner & the mess and some brief ~~discussions~~ explanations by Oppenheimer, Tamm, Kistler & Robb we in very informal conversation we went to bed. The atmosphere was a bit tense as might be expected but everyone felt confident that the bomb would explode. The pool on the size of the explosion ran from 0 (a few feet) to 18,000 (Robb) and perhaps some one at 50,000

NOT DECLASSIFIABLE
PER CURRENT CLASSIFICATION GUIDES
DATE 5-5-72 SIGNED [Signature]

SENSITIVE INFORMATION DELETED

My own figure was 4400 but I never signed up. It was a bad night though the weather forecast had been favorable for a clear day morning with no light winds (the cleared condition). From about 10:30 to 11 AM it blew very hard thus preventing sleep in our tent and promising a postponement of the Test. Then it poured for about an hour!

SANITIZED COPY

DECLASSIFIED
WITH ORISS 1000
AND 82605
JH [Signature] NARS, Date 6 JUL 84

At 1 A.M. Gen. Graves arose and went out to the forward barracks with the key personnel. There were two forward boxes located 10,000 yds. N. & S. of the bomb. The wiring for these points to the tent and to the camp was fantastic in the extent. The instrumentation of the tent included a vast ~~and~~ array of equipment.

at 3:15 A.M., the rain having just ceased, Kelli came into our tent (V. Burd + J.B.C.) and said that there had been much talk of a postponement because of the weather but the reports indicated a 75 % chance of going through with it but at 5 A.M. instead of the scheduled 4 A.M. ~~was~~

We got up & dressed and had ~~some~~ some coffee about 7 A.M. and walked around. The sky was still ~~overcast~~ overcast. It had not rained here at the zero point (the bomb) and the line was O.K. Word then came through about 7:30 that 5:10 would be the time. About 5 P.M. or a little after word came that the firing would occur at 5:30. Shortly after Gen. Graves came back from the forward area. We prepared to view the scene from a slight rise near the camp. Col. S. Warren in charge of health, Tolson, Kelli, Gen. Graves + H.J.B.C. were in on the line together. It was agreed that because of the

expected (or hoped!) light flash and the ultra violet light (no zone to check) it would be advisable to be flat and look away at the start, then look through the heavy dark glass. ~~The~~

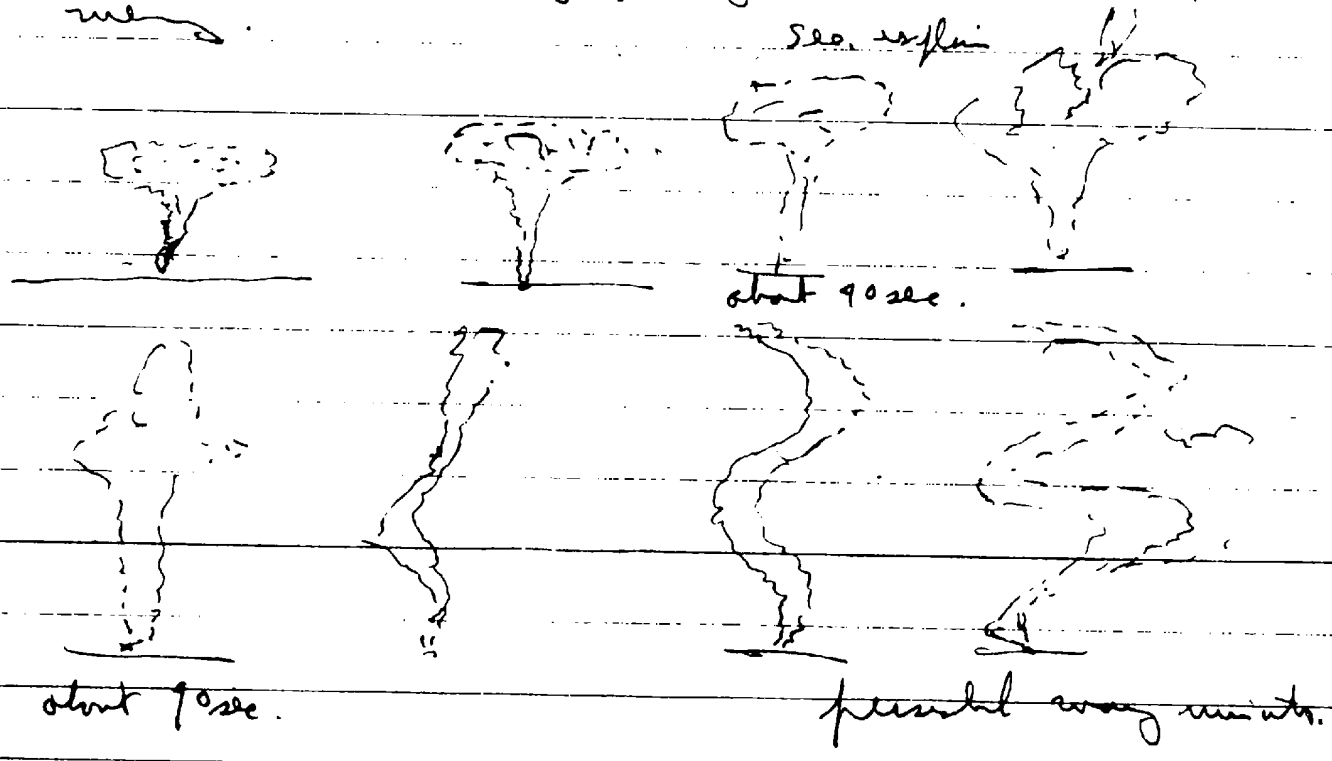
At 5:20 the screen blew the 10 min signal then another at 5:25 and I think another 2 min before. We lay belly down facing 180° away from the spot on a trap tarpaulin. I ~~to~~ kept my eyes open looking at the horizon opposite the spot. It was beginning to be light but ~~was still~~ the general sky was still dark particularly in the general direction I was looking. ^{Just as} the loud speaker nearby of I heard Albion counting the seconds minus 45, minus 40, minus 30, minus 20, minus 10. (The fog was due to some kind of timing device started at minus 45 sec.) These were long seconds! Then came a burst of white light that seemed to fill the sky and seemed to last for seconds. ~~But probably~~ ~~lasted and since~~ I had expected a relatively quick and light flash. The enormity of the light and its length quite stunned me. My instantaneous reaction was that something had gone wrong and that the thermal nuclear transformation

of the atmosphere, once dismissed as a possibility
and jokingly referred to as a few minutes early, heard
actually occurred. Slightly blinded for a second, and
turned on my back as quickly as possible and raising my
head slightly could see the "fire" through the
dark glass. At that stage it looked like an
enormous pyrotechnic display with great billows of luminous
vapors, some spots being brighter than others. A picture
for memory is so seen through heavy dark glass.



Very shortly this view began to fade and without
thinking the glass was lowered and the scene
viewed with the naked eye. The ball of gas was
enlarging rapidly and turning into a mushroom.
It was reddish purple and against the roof above
very luminous, though I instantly thought of it as
colored smoke. ~~Then~~ Then some one shouted
watch out for the detonation wave (this was 40 sec
after zero time). Still on my back I heard the
detonation but was unable in a fraction to notice
any blast (there was no relief ~~at all~~ for little felt
here). The sound was less loud or startling than
I expected but the shock of the sensory impression

was still dominant in my mind. Then I got up and watched the spread of the colored gas burning gas. There were two secondary explosions, after the detonation wave reached us a few feet before. The cloud billowed upward when this occurred and my own thoughts followed up as would an oil fire. The column of smoke color became blue and the whole looked more like a useful fire (though on an enormous scale) The column of smoke then began to disperse and took on a Z shape which persisted for some time. The spectacular part must have been confined to about 90 seconds. The phases observed of the eye were as follows for me.



As soon as I had lowered my dark glasses and before using a shock gen. group hand rules said "Well, I guess there is something in nuclearies after all". Tolman as we rose said, "that is something very different for the 100 Ton TNT shot, 'entirely different' there is no question but what they got a nuclear war". Then several people began saying "They must have been expected. Rabbi said it was 15,000 Tons equivalent at least." ~~and~~

At about 60 sec. as the cloud pulled up, the assembled group, including many MPs, gave out a spontaneous cheer.

Then the reports ~~had~~ began to come in. Offshore arrived in about 5 or 10 minutes and said the equivalent was 2100 Tons which was greeted with great skepticism. It appeared later and he had made an error in converting the first blast measurements and the figure should be 17,000 Tons.

The next exciting news was that the steel tower over "Jumbo" stood away but disappeared. This was reported by some one with a telescope and soon verified by all. This was unexpected and showed a very much more powerful effect than expected. ~~and~~

Before we left at noon, the best estimate seemed to be between 10,000 - 15,000 that Rabbi maintained 18,000 would get from sight. A careful exploration of the crater showed 1200 yds. again more than expected. The toxic problem proved not serious. There in 10,000 ft. all of us evacuated in a hurry as their suits went off the seals almost at once and the cloud of smoke seemed to chase them they declared! All evacuation was by car, of course. One man at the Camp site who looked at the explosion without dark glasses got a bad eye burn & ear was given morphine; the prognosis was that he would need less in sight.

G. Kristian, all hands, came in to report that the ~~detonator~~ shock wave had knocked him down as he stood outside the barracks at 10,000 ft. There were reports of two others being knocked down at the same spot.

My first impression remains the same vivid, a cosmic phenomenon like an eclipse. The whole sky suddenly full of white light like the end of the world. Perhaps my impression was a bit premature ~~in~~ on a time scale of years!

J. B. Grant Washburn 9:30
 July 17, 1955 PM

(21)

1/7/ SRD

ACCESS RESTRICTED

The item identified below has been withdrawn from this file:

File Designation Bush, V. DSM

Date 17 Jul. '45

From J. B. Conant: "Notes on the
Trusty test"

In the review of this file this item was removed because access to it is restricted. Restrictions on records in the National Archives are stated in general and specific record group restriction statements which are available for examination. The item identified above has been withdrawn because it contains:

☒ Security-Classified Information

☐ Otherwise Restricted Information

DOE

Authority

1972 (by AEC)

Date

WITHDRAWAL NOTICE

Notes on the "Trinity" Test Held at Alamogordo Bombing Range

125 miles south east of Alburquerque

5:30 a.m. Monday, July 16

V. Bush, Gen. Groves, and J.B.C. arrived at the Base Camp located 10 miles from the bomb at about 8 p.m. Sunday evening. After dinner at the mess and some brief explanation by [J.R.] Oppenheimer, [R.C.] Tolman, [G.] Kistiakowsky, and [I.I.] Rabbi [*sic*] in very informal conversation we went to bed. The atmosphere was a bit tense as might be expected but everyone felt confident that the bomb would explode. The pool on the size of the explosion ran from 0 (a few pessimists) to 18,000 (Rabbi [*sic*]) and perhaps someone at 50,000 [*several words censored*]. My own figure was 4400 [tons of T.N.T.] but I never signed up. It was a bad night though the weather forecast had been favorable for a clear early morning with light winds (the desired condition). From about 10:30 to 1 a.m., it blew very hard thus preventing sleep in our tent and promising a postponement of the Test. Then it poured for about an hour!

At 1 a.m. General Groves arose and went out to the forward barricade with the key personnel. There were two forward bases located 10,000 yds. N. & S. of the bomb. The wiring from this point to the test and to the camp was fantastic in [their extent?]. The instrumentation of the test included a vast array of equipment. At 3:15 a.m., the rain having just ceased, Rabbi [*sic*] came into our tent (V. Bush and JBC) and said that there had been much talk of a postponement because of the weather but reports indicated a 75% chance of going through with it but at 5 a.m. instead of the scheduled 4 a.m.

We got up & dressed and drank some coffee about 4 a.m. and wandered around. The sky was still overcast. It had not rained however at the zero point (the bomb) and the lines were O.K. Word then came through about 4:30 that 5:10 would be the time. About 5 p.m. [*sic* — a.m.] or a little after, word came that the firing would occur at 5:30. Shortly after, General Groves came back to the forward area. We prepared to view the scene from a slight rise near the camp. Col. S[*tafford*]. Warren [*was*] in charge of health, Tolman, Rabbi [*sic*], Gen. Groves & J.B.C. were more or less together. It was agreed that because of the expected (or

hoped!) bright flash and the ultra violet light (no ozone to absorb it) it would be advisable to lie flat and look away at the start, then look through the heavy dark glass.

At 5:20 the sirens blew the 10 min signal then another at 5:25 and I think another 2 mins. before. We lay belly down facing 180 [*degrees*] away from the spot on the tarpaulin. I kept my eyes open looking at the horizon opposite the spot. It was beginning to be light, but the general sky was still dark particularly in the general direction I was looking. Through the loud speaker nearby I heard [Samuel] Allison counting the seconds minus 45, minus 40, minus 30, minus 20, minus 10. (The firing was done by some kind of timing devices started at minus 45 sec.) These were long seconds! Then came a burst of white light that seemed to fill the sky and seemed to last for seconds. I had expected a relatively quick and bright flash. The enormity of the light and its length quite stunned me. My instantaneous reaction was that something had gone wrong and that the thermal nuclear transformation of the atmosphere, once discussed as a possibility and jokingly referred to a few minutes earlier, had actually occurred. Slightly blinded for a second, I turned on my back as quickly as possible and raising my head slightly, could see the “fire” through the dark glass. At that stage it looked like an enormous pyrotechnic display with great boiling of luminous vapors, some spots being brighter than others. A picture from memory is as seen through *heavy* dark glass.

Very shortly this view began to fade and without thinking the glass was lowered and the scene viewed with the naked eye. The ball of gas was enlarging rapidly and turning into a mushroom. It was reddish purple and against the early dawn very luminous, though I instantly thought of it as colored [*somewhere?*]. Then someone shouted watch out for the detonation wave (this was 40 sec after zero time). Still on my back I heard the detonation but was not in a position to notice any blast (there was relatively little felt here). The sound was less loud or startling than I expected, but the shock of sensory impression was still dominant in my mind. Then I got up and watched the spread of the colored luminous gas. There was two secondary explosions, after the detonation wave reached us or just before. The cloud billowed upward when these occurred and very soon thereafter billowed up as would an oil fire, the color became less and the whole looked more like a [*unintelligible*] fire (though on an enormous scale). The column of smoke then began to spread and took on a Z form which persisted for some time. The

spectacular part must have been confined to about 90 seconds. The phases observed by the eye were as follows from memory.

As soon as I had lowered my dark glass and before rising I shook Gen. Groves hand who said “Well, I guess there is something in nucleonics after all.” Tolman as we rose said, that is something very different from the 100-ton TNT shot, “entirely differently, there is no question but what they got a nuclear reaction.” Then several people began saying, “Very much larger than expected. Rabbi [*sic*] said it was 15,000 Tons equivalent at least.”

At about 60 sec. as the cloud billowed up, the assembled group including many MPs’ gave out a spontaneous cheer.

Then the reports began to come in. Oppenheimer arrived in about 5 or 10 minutes and said the equivalent was 2100 Tons which was greeted with great skepticism. It afterwards turned out he had made an error in converting the first blast measurement and the figure showed 7,000 tons.

The most exciting news was that the steel tower over “Jumbo” 800 yards away had disappeared. This was reported by someone with a telescope and verified by all. This was unexpected and showed a very much more powerful effect than expected.

Before we left at noon, the best estimate seemed to be between 10,000–15,000 though Rabbi [*sic*] maintain 18,000 would yet prove right. Careful exploration of the crater showed 1200 yards again more than expected. The toxicity problem proved not serious. Thought at 10,000 [*yards*] North evacuated in a hurry as their meter went off the scale almost at once and the cloud of smoke seemed to chase them they declared! All evacuation was by car, of course. One man at the Camp Site who looked at the explosion without dark eye glasses got a bad eye burn and was given morphine: the prognosis was that he would not lose his sight. G. Kistiakowsky, all [*frowns?*], came in to report that the shock wave had knocked him down as he stood outside the barricade at 10,000 S. There were reports of two others being knocked down at the same spot.

My first impression remains the most vivid, a cosmic phenomena like an eclipse. The whole sky suddenly full of white light like the end of the world. Perhaps my impression was only premature on a time scale of years!

J.B. Conant, Washington, D.C.

July 17, 1945 4:30 p.m.

[First version of transcript prepared by Professor James Hershberg, George Washington University, with later edits by Alex Wellerstein, Stevens Institute of Technology, and William Burr, National Security Archive]