CONFERENCE ABOUT CONTAMINATION OF COUNTRYSIDE NEAR TRINITY WITH RADIOACTIVE MATERIALS

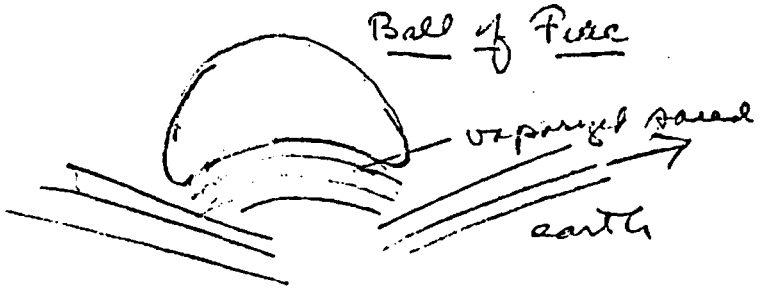
PRIVACY ACT MATERIAL REMOVED

Present: R. Oppenheimer, R. Holman, L.H. Hempelmann, Col. Warren, Capt. Nolan, J. Hoffman, J. Hirschfelder, V. Weisskopf, Magee, Capt. T. Jones, and P.C. Abersold.

Hirschfelder's discussion of mechanism by which radioactive materials fall out of cloud.

After explosion most of active material is on fringe of ball of fire. When shock wave hits ground (expanded 100 ft.) ball of fire will be 10 ft. from ground. Reflected shock wave will bring up some dirt, largely vaporized. ~~Expect~~ 10% of energy of gadget ~~in~~ ball of fire ~ 500 tons TNT, at most, to vaporize 100-200 tons of sand. Under ball of fire will be air under compression—after shock wave passed dirt will pop up.

Fig. I



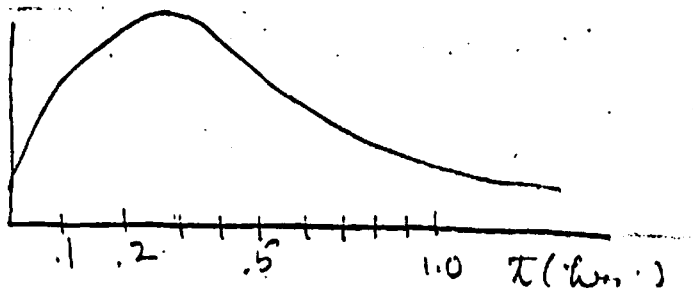
Most of dirt will go out at angles, but there will be conditions of turbulence bringing earth into ball of fire. Vaporized sand will form smoke. Active material will be deposited on smoke and on sand. Oppenheimer questioned deposition on sand as compared with formation of nuclei of active material. Weisskopf pointed out that there would be a competition for the active material by atoms, smoke, and sand. Time for active atoms to find each other is longer than for active atoms to find smoke and sand particles. Guess that 10% to 50% of activity deposits on sand.

This ball of fire cools in a few tenths to several seconds during which time all activity condenses on smoke or sand. Assumed rise to 12,000 feet.

Particle size and time of fall:

Diam u	t fall hrs.	% Act
840	.110	3.8
250	.208	12.6
149	.585	14.5
74	2.37	18.1
less than 74		51%

Figure II.



Weisskopf explained influence of wind velocity and height of cloud on activity on ground. If the wind velocity is doubled ~~the time~~, the activity on the ground will be doubled if the height is the same. Doubling the height will double the activity if the wind velocity is not changed.

60 miles / 30 miles ~ 2

24,000 / 12,000 ~ same

There is lateral spread and spread due to falling from greater height.

If all activity on cold sand following table results

Figure III.

Distance from zero	h	wind velocity	R/hr on ground	
30	12,000	30	4	
30	24,000	30-60	6.3-15	(reduced by lateral spread)
30	12,000	60	11	
12	12,000	30	100	
12	24,000	30	110	reduced by lateral spread
12	24,000	60	200	
30	12,000	10	(0.6)	

Danger ends after about 2½ hrs.

Low ground winds improve situation by not carring activity as far. Ground winds should help spread activity. Afternoon thermals very strong, will break cloud up. Cloud gets bigger as h increases ~ lateral spread greater as h increases.

Summarize of discussion to this point

1. Prefer wind velocity not too high, propose 15-30 mi/hr.

2. Inversion at any altitude above 8-10,000 ft. will be O.K.

3. Wind not blowing over Carrizozo.

4. Exclude rain within morning hours.

5. Unlikely in a low wind to get into trouble unless direction indeterminate

Tolman brought up question of tolerance dose. took 60r in two weeks as safe. Even 100r would not be harmful provided there would be though a wind velocity of 30 mi/hr along either the N or S "blow" and an inversion around 12,000 ft. would be best.

Directions of wind were considered. South blow over Oscuro or Polly has the advantage of no near towns and has two mountain ranges to provide turbulence spreading. At end of ~~70 mi~~ ← falling range for 70 micron particles (2½ hrs.) dose will be small. North blow over Largo or Coyote has lots of farms but not much population close.

Question of integral dose considered. After 6 hrs. can get 4 times dose already accumulated. Effect of rain and wind may reduce the dose. ~~would get worried~~ would worry if peak reached 10r. Would make measurements for several hours and consider evacuation if total dose reached final total of 60-100r.

Tolman thought height of inversion not important (since, if too low, cloud will go through it), low wind velocity would be desirable, plans for evacuation should be very good. Plans for evacuation must be effective. Means a definite direction should be picked.

Weather policy will be made will be made definite at Trinity meeting Thursday. By Saturday rehearsal plans of Medical Group can be definite.