

However, in no case would one fire a nuclear detonation in water. You have to arrange the detonation, its point of explosion, under conditions such that it would not reach the water, and I believe that one can do this by judiciously selecting a detonation site.

Senator ALLOTT. Roughly what temperature would be generated at the source of the explosion?

Mr. KELLY. Oh, the initial temperature released by a nuclear explosion is in the order of a few million degrees.

Senator ALLOTT. Two?

Mr. KELLY. A few.

Senator ALLOTT. A few million? Fahrenheit or centigrade?

Mr. KELLY. Either one. It would be high enough that it would be in the range of several millions Fahrenheit or about half that by centigrade.

Senator ALLOTT. All right.

On chart 1 you envision a typical double chimney and what would you envision the height of that chimney to be?

Mr. KELLEY. Well, that depends on the type of rock, the depth of burial.

Senator ALLOTT. We are talking about shale.

Mr. KELLY. All right.

Senator ALLOTT. I am only talking about shale.

Mr. KELLY. I guess one of the experiments that has been conducted which is fairly similar to this shale, in at least its physical characteristics, was a shot in granite and it was 5 kilotons and the point of detonation if I recall correctly was about 900 feet underground and in that case the chimney height was about 300 feet.

Senator ALLOTT. Well, I am not trying to trap you, but I am sure you see the point I am making which is that if you fired this, even under the oil shale bed, and your explosion reaches into areas with soda water, you take a chance of contaminating that particular supply or source of water.

If that water is not in a closed basin and later reaches a major drainage area, then you are dabbling with the prospect of contaminating water supplies.

Has this been given any thought?

Mr. KELLY. Yes, sir. If you notice on that same chart, down at the very bottom of that chimney there is a very dark area, and most of the radioactivity that is produced by the nuclear detonation winds up in an insoluble fused rock. It is imbedded in the fused rock which collects at the bottom of the chimney, and so even if water after the fact somehow got through there, the radioactive materials in this fused rock zone would not be readily available to the water.

There is some small amount of radioactivity, mostly in the form of gases and very small particles that would permeate the chimney.

If water got into that, these particles could be picked up and to some extent follow the flow of water. One would have to be extremely careful so as to prevent a flowing water source from passing through this chimney or, in other words, be very careful to make sure the chimney did not extend into an underground aquifer.

Senator ALLOTT. The very area we are talking about that has been discussed most this morning as a possibility for nuclear test is ex-