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Recollections of My Participation in the Manhattan Project

I received my Bachelor Degree in Physics at the University of Chicago in 1943 when I was 20 years old. I was hired by the Manhattan Project at the University of Chicago where the nuclear reactor was developed, headed by Fermi. I worked in a group that operated a cyclotron and measured the properties of atomic isotopes related to Uranium and Plutonium nuclear reactions. I published papers on Nickel 59, Cesium 132 and 136 and Xenon. After I worked one year, the Manhattan Project shut down its Chicago University facility because the nuclear reactor was operating.

In 1944 I was sent to Los Alamos and worked in the group that determined the amount of Uranium 235 needed to produce an atomic bomb. The experiments would measure the nuclear radiation produced by Uranium 235 (an assembly of ½ inch Uranium 235 cubes) placed in the center of a tamper container. The tamper was filled hydrocarbons or metals or other materials. Some of the neutrons produced in the Uranium 235 nuclear reactions left the Uranium into the tamper and were scattered back into the Uranium. Tests were made with different amounts of Uranium, tamper size, or material in tamper. The tests were to determine the critical setups. A critical setup is when neutrons produced by the nuclear reactor would interact with Uranium and produce more neutrons increasing the number of neutrons. The neutrons produced in the nuclear reaction were mainly from the reaction and some from the atoms produced. The atoms produced neutrons in seconds. At the critical point all the neutrons were used, so the neutron growth rate was slow.

I participated in an experiment in which Uranium 235 placed in a plastic bag was dropped down the middle of a sphere with hydrocarbons. The purpose was to determine the critical setup using only the neutrons from the reaction and not from the radioactive atoms. Hydrogen slowed down the neutrons produced in nuclear reactions, greatly slowing down the neutron intensity growth rate. Nuclear reactions occurred only while the Uranium passed through the center of the sphere. The amount of Uranium was increased with each dropping. In the final dropping the neutron growth rate was so fast that the plastic melted. The experiment handled by three people was

behind a wall eight-foot thick. Our room had many radiation detectors and they were saturated for a long time with radiation from the atoms produced by the nuclear reaction. We were lucky that we were not killed.

About a month before bombs were dropped on Japan I was sent to Tinian, where the US assembled the atomic bomb to be dropped on Japan. I was in the group {Charles Baker, Raemer Schreiber and Phil Morrison} that assembled the Plutonium section of the Fat Boy bomb that was dropped on Nagasaki. We checked the plutonium coating by rubbing it with a napkin and then checking the napkin for radioactivity and never measured any radioactivity.

When the planes carrying the nuclear bombs took off, I was at the center of the runway with a radiation detector. If a plane carrying the bomb had an accident, then I would search for radiation at the plane. I was placed at the runway because I was the youngest member of our group. The other members were placed further away, up to eight miles.

After the war was over Admiral Nimitz visited our laboratory on Tinian. We described what we did and said that the plutonium explosion was equal to 20,000 tons of dynamite. He said “you might believe it but I don’t” -- and he walked out.