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During the next decade, research progressed steadily, if unspectacularly. Then, in 1932, came a series of three discoveries by scientists working in three different countries which led to the next great advance.

Walter Bothe in Germany, and Frederic Joliot-Curie in Paris prepared the ground work that led James Chadwick of England to the discovery of the neutron. The neutron is an electrically neutral building block of the nuclear structure. The other building block is the positively charged proton.

The next step was taken in Rome in 1934. In experiments in which I was concerned it was shown that these neutrons could disintegrate many atoms, including those of uranium. This discovery was to be directly applied in the first atomic chain reaction eight years later.

The Discovery of Fission

The final stepping-stone was put in place in Berlin when Otto Hahn, working with Fritz Strassman, discovered fission or splitting of the uranium atom. When Hahn achieved fission, it occurred to many scientists that this fact opened the possibility of a form of nuclear (atomic) energy.

The year was 1939. A world war was about to start. The new possibilities appeared likely to be important, not only for peace but also for war.

A group of physicists in the United States—including Leo Szilard, Walter Zinn, now director of Argonne National Laboratory, Herbert Anderson, and myself—agreed privately to delay further publications of findings in this field.

We were afraid these findings might help the Nazis. Our action, of course, represented a break with scientific tradition and was not taken lightly. Subsequently, when the government became interested in the atom bomb project, secrecy became compulsory.

Here it may be well to define what is meant by the "chain reaction" which was to constitute our next objective in the search for a method of utilizing atomic energy.

An atomic chain reaction may be compared to the burning of a rubbish pile from spontaneous combustion. In such a fire, minute parts of the pile start to burn and in turn ignite other tiny fragments. When sufficient numbers
