were measured in the waves traveling toward the east. The explanation of all this is that near the Mohorovicic discontinuity (which lies about 20 miles under the surface) standard variations of sound velocity occur; these variations appear to be different in the Mississippi basin. The fact that this basin is aseismic, together with the imperfection of usual seismic observations, had hidden this particular property of the Mississippi basin from our seismologists up to the time of the Gnome event.

Another example of the same kind is the exploration of the earth layers under Antarctica. It is generally assumed that Antarctica is a continent. In reality we do not know whether this is so or whether the area of the South Pole is occupied by a frozen archipelago. In the first case the Mohorovicic discontinuity should be at a much greater depth than in the second. Since there are no earthquakes in that region, we are ignorant of the position of the discontinuity. Thus a single nuclear explosion under favorable conditions of observation could settle an important question in geophysics.

Nuclear explosives have been utilized for finding out more about the important neutron resonances in various elements. In 1958 George Cowan used time-of-flight experiments of neutrons emitted by a nuclear device to settle an important question in the theory of neutron resonances in uranium-235. Due to the abundance of these neutrons, it is possible to find the distribution of fission fragments produced by individual resonances. Cowan found some evidence for two types of resonances which might well correspond to compound nuclear states with spin values 3 and 4 as is expected from the one-half spin of the neutron being added and subtracted from the seven-halves spin of uranium-235.

In connection with the Gnome shot neutrons were moderated to energies between 10 and 100 volts. Dr. Cowan repeated his experiment and additional