basic method of gathering large quantities of information. Film must necessarily be returned, so here again, our reentry capability is very important.

With that background I would like to talk about the Gemini, Apollo, and Apollo Applications experiments programs.

Although Gemini wasn't planned to include an extensive experiment activity, we flew 111 experiments in the program, and these 111 experiments weighed on the order of 1,500 pounds, or about 150 pounds average per flight. We were able to add these experiments without significantly affecting the basic mission of the Gemini program.

Where did these experiments come from? They come from many sources. We do not develop all of these experiments inhouse (fig. 1). Our 17 scientific experiments, which we flew several times each, came from universities, laboratories, industry, and Government centers, including the Universities of Minnesota, Northwestern, California, and others. Our technological and engineering experiments came mainly from our NASA centers and the Department of Defense. We flew 15 experiments for the Department of Defense.

Then Dr. Berry and other medical people, both here and elsewhere, such as Dr. Mack at Texas Women's University, flew eight medical experiments, each several times.

In addition, to the Gemini carrying 1,500 pounds of experiments for us, some 22 percent of the inflight crew time was used in conducting experiments.

I might mention that of those 111 experiments we had planned, some 90 of them were carried out successfully. Those that weren't completed were due to spacecraft or experiment hardware problems.

Now, just a few slides to show you what kind of equipment we used to perform these experiments.

The simplest equipment we used were rather simple cameras shown here (fig. 2). This morning George Low mentioned the Hasselblad camera. The Hasselblad was a workhorse, but here was another camera we used, a Maurer camera, which we could adapt with various lenses to do simple astronomy experiments.

Another type of experiment we did was to explore the combined effects of radiation and zero "g" on blood cells. Shown here (fig. 3) is our small package which was activated by the astronaut to subject blood cells to calibrated radiation levels while at zero "g". The blood cells were returned to Earth for comparison with ground controls.

These are both fairly simple experiments, as far as incorporating them into the spacecraft.

I might show you our most complex hardware experiment that we worked into the Gemini program. It was a radiometry experiment, and it was conducted for the Department of Defense. We had to install three sensors, shown here (fig. 4) into the spacecraft, and these sensors were responsive to radiation at various wavelengths. They were designed to measure and record that radiant energy that is emitted from various types of vegetation, land masses, oceans, other spacecraft, the Moon, stars, and so forth.

In addition to the sensors we had to have controls; optical sights through which the pilot could acquire and point to the various targets he wanted to see; recorder electronics; thermal control, et cetera;