

I would like to go quickly with you through the EVA things, and to add to what Buzz said.

We will show you the heart rate that went along with these activities that he was talking about.

Oh, we have to finish up bones first, I am sorry.

The one area we didn't finish up with was what happened to the calcium in the bones, and we looked at the heel bone, which you see, here (fig. 26), and at the small finger (fig. 27). This was by an X-ray technique, and was confirmed by a detailed metabolic study in the 14-day flight. You see here, the loss in density—this is of the os calcis, the heel bone, in the 4-day flight for the two individuals, for the command pilot, here, for the pilot, and, then, here for some bed rest patients in a study at Texas Women's University for the same period of time, for 4 days, and note the intake of calcium, here, 6 to 7 hundred milligrams a day.

Here is for the 8-day period, and notice, again, we are getting an increasing trend and, then, here is what happened at 14 days.

Now, again, look at the calcium intake due to the very low caloric intake on that flight, remember, a thousand calories on that 8-day flight, and they had only 300 milligrams of calcium, and this probably accounts for some of this effect, and, here, they had a gram of calcium a day that they took in, in their diet. They were not given any extra calcium, no calcium pills, or anything of the sort.

Congressman WAGGONNER. You say studies at Texas Women's University, you weren't comparing male and female, now?

Dr. BERRY. No. No, we were not.

Congressman CABELL. Mr. Waggonner, I will have you to know that a very fine lady developed the technique for that, and we have that kind of brain power in Texas.

Dr. BERRY. Yes, sir; you certainly do.

Dr. Pauline Mack is a very—

Congressman WAGGONNER. Everybody has something to brag about.

Dr. BERRY. This is for the small finger. I think the very interesting thing here is that this is a nonweight-bearing bone, of course, and we thought that it could be used as a control, and interestingly enough, in density of that bone than we did of the heelbone, which is a weight bearing bone, but, again, the same trend, up at 8 days and back down. So, we can't tell you—this is an interesting phenomenon, and is something that needs to be looked at more, but as to why this is happening, we are unable to say at the present time.

Congressman ECKHARDT. Well, can that calcium intake explain it?

Dr. BERRY. It can be a factor. It certainly is a factor in it. We don't think that it is the total explanation of why this is happening.

Now, weightlessness should produce loss in the calcium in the bone. We expect it to do this over a period of time, really it is more prolonged periods of time.

The thing that I think we are going to see is that by exercise you can prevent this, and certainly if you gave calcium doses I think you could prevent it even more, and we want to find out how much of a problem, if any, it is before we determine if we want to treat it in any way by the giving of calcium.