

son, but they all conclude that manned planetary exploration is a desirable and necessary thing that man will do in the course of time.

With that as a basis then one needs to define a program that optimizes one's getting there. You could make a different assumption and then you would have a different set of results. Since there is almost universal agreement among those people that have examined the course of development that man will eventually be needed to explore the planets, then the question is what is the most economical way of arriving at that objective.

The other thing is to define what is possible and what is desirable.

Mr. FULTON. When you are talking about planetary exploration, I have always been interested in the asteroid belt, which as you know, lies between Mars and Jupiter. One of these asteroids is going to approach Earth very closely. Why don't we try to see what it is going to be doing in the next couple of years; why don't we have an effort of this type in the program and see what an asteroid is?

Dr. MUELLER. Dr. Newell has had under consideration probes to comets as they pass Earth in order to get some closeup views and some idea of their trail. The asteroids are somewhat beyond Mars and tend to be in orbits that don't interest our orbit directly. One of the interesting possibilities as well as problems of a Mars flyby, for example, is in coming past Mars you also come out in the asteroid belt before you return. You might not be able to avoid a major asteroid. The advantage is that it gives you an opportunity for close and detailed observation of a number of asteroids as one spends some time out there.

Mr. FULTON. With 50,000 asteroids strewn in your path, it would certainly be worthwhile for you to learn about them ahead of time.

Dr. MUELLER. Yes, sir.

Mr. FULTON. Secondly, when the Manned Space Flight Subcommittee flew in from Arizona we saw that tremendous crater where some sort of an asteroid hit. So when I hear that within the next couple of years, there is a one chance in a billion that a particular asteroid will actually hit the Earth or go into orbit around us, I believe we ought to be looking into it. I don't want to be in the position of my great aunt living in Erie who was 80 years in age and was always frightened to death because Niagara Falls was going back 37 feet a year. This particular asteroid may be too far out to be of danger. However, it would give us a chance to see what these asteroids are, particularly if we are going to Mars. We might conceivably acquire another moon in the next couple of years or might possibly be in the path of the asteroid.

Dr. MUELLER. That is a possibility.

Mr. FULTON. So we may have to go up and hitch a rocket to it.

Dr. MUELLER. But it is, of course, fortunately an extremely remote possibility.

Mr. FULTON. In astronomy, one chance in a billion isn't too remote.

Dr. MUELLER. Turning to one of the major applications of Earth orbital applications, we have carried out some studies of optical telescopes (MC66-5366, fig. 5) in Earth orbit and have looked at some comparisons between various kinds of telescopes (MC66-5597, fig. 6). For example, the 200-inch Mount Palomar telescope has a resolution