

ground the whole environment problem is intensified. Air must be supplied to the working people. So here we have a sealed capsule with people driving the machine. At this speed and this size they must be sure they are driving accurately. When you are going 25 miles at 1,750 feet a week, a few degree off will cause intolerable inaccuracies. So a system of laser beams is set up to control and direct the guidance of the machine accurately.

Most importantly, we must design the tunnel using the geology of the terrain to our advantage. The rock formations must be considered in relation to the path of the tunnel. Selection must be based on geological considerations.

Well, to sum it up, we think this is a very exciting program. We think we can make real headway with the tunneling system operating, to a point where we can not only advance the technique of mining—incidentally, a machine of this type is being considered for oil shale—but we can also advance the concept for subsurface utilities for use in every day society. Thus not only making a contribution to our own special industry but a contribution to society as a whole.

Thank you very much.

The CHAIRMAN. Thank you, Dr. Hibbard, for a very fine presentation.

Senator Hansen.

Senator HANSEN. I am quite impressed with it. Especially when I think we might be drilling at 1,750 feet a week.

The CHAIRMAN. Senator Anderson.

Senator ANDERSON. I have one question of Dr. Bates.

You mentioned some relationship of atomic energy to space groups for work on the moon.

Dr. BATES. Yes.

Senator ANDERSON. What was that again?

Dr. BATES. The Geological Survey is now developing a 10-wheel mobile unit which they call the Trespasser which will, hopefully, be flown someday to the moon. It will be able to move over the surface, carrying its own atmosphere with it, in order to better analyze the nature of the lunar surface. I am sure Dr. Pecora would be glad to give you more detail.

Senator ANDERSON. Is this in connection with the space program?

Dr. BATES. That is right. I am sure you already know the Geological Survey has been very much involved with NASA's study of the moon on the basis of exploration we have had so far.

Senator ANDERSON. Well, there is a device they are now working with on the moon that was put there by the Space Administration. What is this particular experiment you are having?

Dr. BATES. This is Dr. Fischer, who is Research Coordinator of the EROS program.

Dr. FISCHER. I do not believe, sir, the one operating is capable of carrying men. The one the Geological Survey is developing is a manned vehicle. It is being developed only in cooperation with NASA. They are testing a prototype with NASA in the field leading to development of a suitable vehicle.

Senator ANDERSON. We are ready to start appropriations and I was wondering if this was a duplication.

Dr. BATES. I think not, Senator Anderson. We must work very far ahead in the development of devices which may not be on the