TODAY in Space

Apollo End Is No Joy

EDITOR'S NOTE: This week's column is a letter from Dr. Farouk El-Baz, a scientist with NASA. Dr. El-Baz wrote his views in answer to a Sept. 19 article in TODAY in which fellow scientist Ewen A. Whitaker decried the fact NASA was flooding the scientific community with lunar photographs and he would be glad to see the Apollo program at an end.

By DR. FAROUK EL-BAZ

The views concerning Apollo that are attributed to Mr. Ewen A. Whitaker, that "We're really saturated with material," and "I won't be sorry when it's over," are indeed unfortunate. I am one of those persons "who can interpret moon photos" and I know I will be sad and disappointed when the Apollo luar program comes to an end after Apollo 17. Mr. Whitaker's views must be considered one man's opinions that are not shared by his colleagues. He and I both are members of the Apollo Photo Team and I disagree with these views for two reasons:

First, relative to Mr. Whitaker's main interest which is lunar photography, the best photographic systems have been flown only twice before — on Apollo 15 and 16 — and will fly on Apollo 17. Two systems make a package: a metric camera system that provides well-controlled photographs for map making, and a panoramic camera that obtains high resolution photography in which the smallest decipherable object is the size of an automobile.

The combined coverage of all Apollo metric and pan cameras, including that planned for Apollo 17, comes to only about 17 percent of the lunar surface. No one should claim saturation" or the ability to do without the rest if one has only less than one-fifth of the complete story.

Second, photography is not the only or the most important of the Apollo scientific returns. Apollo lunar exploration is basically directed at the study of the moon, its composition, internal structure, and history and evolution of its surface features. This can only be accomplished through an integrated package of scientific objectives. Of these, I will mention the selection of samples, deployment of geophysical observatories, and making visual observations.

Samples of lunar rock and soil carefully selected by moon explorers perhaps constitute the single most valuable Apollo scientific return. Only by detailed study and anlysis of these materials can definitive conclusions on the chemistry, age, and conditions of formation of major lunar surface units, and the mode of origin, evolution and history of the various lunar features.

Apollo crews also set up geophysical stations on the moon with instruments to monitor and study its environment.

Observations made on the surface by Apollo field explorers constitute an important scientific return. Also, from the orbiting Command Module, and to complement photography and other remotely-sensed data, the Apollo astronauts make visual observations of lunar surface features and processes. Because of the special sensitivities of the human eye and the interpretative powers of the brain, these observations have made valuable contributions which could not be provided otherwise.

The need exists in many cases to make on-the-scene interpretations of observed features, that are hard to understand by studying photographs. To cite one example, let us not forget that it was Al Worden's observation of what appeared to be volcanic "cinder cones" that directed the attention of the scientific community to the Taurus-Littrow region, and finally led to its selection by NASA as the landing site of Apollo 17.

Now, what is on the moon that makes scientists want to go back, even after six Apollo landings? Mine is a simple answer prompted by my training as a geologist. To me, geology is a dialogue between man and Earth, and to fully understand Earth's present form and future dynamics, we must understand its history and evolution through the eons.

We now believe that the Earth, as part of the solar system, was formed about 4.5 million years ago However, the oldest rocks we now find on Earth are about 3.5 million years old. What happened to the first billion years of earth's history? It was erased from the record by the dynamic processes which continue to change the Earth's crust, particularly by weathering and erosion which are a result of Earth's unique atmosphere. Those first billion years are formative, and just as important as the early years of a developing child. During that period — of which we know almost nothing — much of Earth's "personality" was forme .

We now also believe that the earth and moon were made from similar materials at about the same time. Lacking an atmosphere and Earth-like dynamism, the moon's surface remained virtually unchanged since its formation, except for the effects of large impacts. Therefore, the moon is a window at Earth's early history. From the study of the Apollo data we hope to decipher the early history and evolution of our own planet and perhaps the solar system.

This simple answer shows how important Apollo science is to geology. Other fields of science also benefit greatly from Apollo lunar exploration, not to mention the technological, strategic, economic, and spiritual benefits. Apollo is by far man's greatest project in his quest for knowledge, and the exploration of the unknown, and I can only express regret that the program is coming to an end.