1972 MAY 5.

Dr. Brian Mason,
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Smithsonian Institution,
Washington, D.. C. 20560

Dear Brian:

May I impose on you for a free mineralogy or petrology lesson?

The prominence in moon rock literature of references to anorthosite (following Wood etal) has naturally interested me in that rock; I gather that a good pure specimen would probably consist almost entirely of anorthite and be white. I also gathered from some reading a few years ago that this rock occurs terrestrially in only a few places, say three or four, in any large quantities, where it is of deep seated origin ("plutonic"?).

I understand there are other occurrences where it is merely in dikes or veins, presumably of somewhat different origin from the large masses. I thought of the occurrence in the Tishomingo regionof Oklahoma as being one of these, and you kindly identified a rock I sent you from there several years ago as anorthsite. But it is pretty black.

I wondered why, and what minerals caused this color. I ran into the following by J. A. Taft from "Preliminary Report on the Geology of the ARbuckle and Wichita Mountains" (1928):

"These dike rocks have considerable variation in tex ure but are all to be considered as diabase. They vary from dense, finely porphyritic contact facies to coarse rocks which might almost be considered gabbros. Their composition is veryuniform. Augite, labradorite and magnetite are always present, biotite rarely occurs, and in only one instance was olivine found, or more correctly, pseudomprphs of serpentine after olivine.

I have about concluded that this described the rock I submitted to you and that the labradorite makes it dassifiable as an anorthosite, but the augite and magnetite make it black. Then I assume this composition is rather different from the moon anorthosite, which I am guessing contains little or none of these dark minerals and that the feldspar is morenearly anorthite than labradorite.

Would you be good enough to correct my conjectures and fuzzy thinking and orient ne a little better on the distinction or comparison between terrestial and luar anorthosite? REmember you are dealing with a poor dilletante who have bever had formal training in your fields!

And while I have you on the phone I will ask another totally unrelated question that has always bothered me: why is typical pyrite brassy in color while the inclusions that commonly occur in lapis lazuli are silvery in cut section? The whole subject of color in rocks and minerals is always intriguing to amateurs, but I am sure it is not too fundamental or significant a property, judging from the way the professionals slight it. I am aware of the fact that a very little of an inclusion or impurity can at times cause a lot of color.

We had a reasonably good fireball here March 22 near 10.50 p.m. and one not quite so good the next morning, March 23, near 5.28 a.m. I made one trip getting observations on both of them but never got on the other side of the path of either. My results are quite indeterminate and unsatisfcatory and indeed I have just about "lost" each fireball as to the sub-final point that one always struggles for in the possible search for meteorites. It is perhaps a coincidence that the Smithsonian Astrophysical even t cards reports three fireballs over Central Europe March 21 and 22.

If you find time to anwer all my inquiries, give me some news of yourself.

Sincerely,

[signature]

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Prelim Report on Geology [illegible]
(over)