

SMITHSONIAN INSTITUTION
UNITED STATES NATIONAL MUSEUM
WASHINGTON 25, D. C.

March 16 1950

Mr. Oscar E. Monnig
1010 Morningside Drive
Fort Worth 3
Texas

My dear Mr. Monnig:

Enclosed you will find some prints of all of the cuts we have taken from your Harriman, Tenn. iron. That is all except the thin slice (1/8" thick) made for the study sample.

The small slice on the print 38942 is the cut from our Harriman sample. From the appearances of these two slices I feel that we have two different, but rather similar iron meteorites and some of my reasons are as follows.

All these slices have been etched by the same process and for the same interval of time with the etching reagent but the appearance of the etched face, that is the luster, color, is very different. Your specimen is much brighter than ours.

On our section there is an embayment of hydrous iron oxide which must be secondary alteration. This extends some distance into the section and must have taken some time for this to form. In the four sections taken from your sample the oxidation film shows no great penetration. I know that we may just have happened to hit a spot in our sample and have not as yet located such a spot in yours. However I can not keep from thinking that our sample is a much older fall than yours. However I can not offer any proof.

There is a different development of the taenite in some of the areas in our specimen. There are bright and rather long lamellae of taenite which are repeated in a series of parallel layers. This is a feature of our specimen and seems to be lacking in yours or certainly not developed to a similar extent.

I have not measured the widths of the kamacite bands in either case as yet, but there is not much difference between the two but ours look to be slightly wider than yours.

I do not attach much importance to the presence of the large inclusion of troilite in your specimen, nor to the numerous small isolated bodies. The large and possibly spherical body appeared in the first two slices we made from yours and in the next two nothing was found. I don't know if you noted it, I did not see it before the section was made, but the troilite inclusion in yours came through to the surface. However its altered phase was not much different from the rest of the meteorite. There is a slight pit at this place but not much difference in levels.

Chemically the two irons are slightly different

	Monnig Sample	U.S.N.M. Specimen
Fe	90.49	91.07
Ni	8.35	7.86
Co	.57	.67
P	trace	.14
S	none	.01
Incol.	.001	.001
	-----	-----
	99.41	99.75
Mol. ratio		
---Fe---	10.73	11.20
Ni Co		
Sp. G.	7.905	7.85
	7.987	7.94

Since both of these irons have been sampled in the same manner, by preparing a thin cross section, etching, and selecting an area of average structure, and one that is free from inclusions these differences in Nickel are real. I often find that a restudy of some old iron that my results do not exactly agree with theirs. This may be due to better known methods of separating iron and nickel, but I think a lot of it is due to better sampling methods. So often the chemist was given filings or a small mass cut from one portion. I may be wrong but I like to know the chemistry of the average structure.

I have studied some irons and then several years later Harrison Brown wrote and asked for some meteorites to check on and I selected his samples. He got results on those meteorites that agreed within .2 % for nickel.

I think that you have the locality information of our specimen but I dont know that I have the record about yours. If you have sent it to me I have it in the files and can locate it but at this moment I dont recall receiving it and it is not recorded on my cards.

I would like to accession as a gift from you two of these cuts and send you the two we have and if you want another cut made I will have it done. I will also etch the face on the main mass if you want it. Now dont let me talk you out of presenting the entire specimen to us. (?)

You have a nice iron and I hope a stable one. I see no signs of any alteration but during the winter we normally dont have much trouble keeping our specimens. Its the hot humid summer weather that hurts us.

Hope you received the print of the original specimen which was sent to you in New York. If you did not get it let me know and I will have another print made.

I certainly appreciate your cooperation and hope that I have not been too slow in getting you this information. Let me know if you agree with what I have said above. I know a lot of people will say that these two irons are identical and represent two individuals of the same shower. That may be the case but I question it.

With kindest wishes and was sorry that you could not arrange to stop off and see me while you were up this way.

Cordially yours

Ed. Henderson

E. P. Henderson
Associate Curator
Mineralogy & Petrology