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Jan. 16, 1968

Dr. Junius B. Bird  
American Museum of Natural History  
Central Park West at 79th St.,  
New York, N.Y. 10024

Dear Junius:

Thank you so much for your letter of January 6th regarding the comments of Lanning and the flint material. Please forgive the tardy reply, but have been down with the flu and am still not on my feet.

I have written to Ed Berry, a rock dealer in El Paso to inquire about material for the proposed collection at the American Museum. I have previously ordered material from this man and am sure he would give me a real fair price on the Texas flint if he has, or can get, some. I purchased the Mexican peacock obsidian from him - believe I left you some small arrowpoints made of this material. His prices are reasonable; for instance the obsidian was only \$8.00 per hundred pounds. I shall continue to search for some good flint, for I think a display of a variety of materials would be more effective than obsidian alone. Tixier is going to send some Grand Pressigny flint and expect Bordes will also ship some French flint and I have some assorted materials here in Kimberly.

Junius, I am quite disturbed about Lanning's quote. To begin with I deny ever saying "Every single broken Chivateros biface was broken in use, not during manufacture." It has always been my policy to shy away from ambiguous statements like this whether I am discussing manufacture or function, for I know only too well from my experiments how misleading intentional breaks can be and I do not feel I have studied enough or experimented enough with function to make a statement even approximating that. Since I do not know how many bifaces were found at the quarry site source and it is highly unlikely that the toolmaker could avoid accidental breakage, I would be hard put to reconcile the functional act which caused this break and would not put myself out on a limb like that. Further, I only spent at the most three hours with Ed, and the representative collection of material from Chivateros, Peru was much too large to permit a detailed and definite analysis in a short period of time.

I do recall a broken biface which had a midsection break similar to those in my collection of Neolithic axes from Denmark which appear to have been broken from function rather than manufacture. This broken Chivateros biface was not fractured in the normal manner associated with manufacturing inaccuracy, and I pointed out to Ed a few features of determining a manufacturing miscalculation break - not function.

In my experiments, I have noticed that when a biface breaks in the midsection during manufacture, it generally leaves compression rings which radiate from the point of force on one lateral margin and progress toward the opposite lateral margin; and the break is generally at an angle to

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the long axis. This is usually the result of inaccurate use of the percussor, i.e. striking at less than a right angle to the long axis. The specimen we discussed showed compression rings originating in the midsection and radiating from the dorsal to the ventral side - contrary to the typical midsection break due to manufacturing error. We compared this specimen to another which had a similar fracture, apparently the result of similar forces. If, at the time, I did not tell Ed that the two bifaces with similar breaks could be caused by conditions other than function, I most certainly should have, for function can only be implied unless substantiated by experiment.

Although it is not normal for a biface to snap in the middle as this piece did, it is certainly possible that different holding methods, different techniques, different workmen, and varieties of material could react this way in the fabrication stage. Examples of similar midsection breaks from manufacturing error are: If the biface is held in the hand during manufacture and the toolmaker is working on either the proximal or distal end with the opposite end unsupported, a blow from the hammerstone could cause it to break in the middle. This is because the hand acts as a fulcrum and the downward force on one end will teeter-totter the biface and could cause a break similar to that on the Peruvian biface. Again, if the biface is struck on the midsection; or if it is dropped and the point of impact is in the midsection, the forces would be much the same and the break could be much the same.

I cannot recall if there were any use flakes on the working edge of the biface (the end opposite the midpoint fracture), for when I have the opportunity to study a collection as important as this, my prime interest is in the manufacturing techniques and technological traits and I generally pay no attention to functional scars. Functional scars are a separate and complex study and I feel one must not only experiment before he can attempt interpretation, but must verify the experiment by actual use - such as Dick Gould has done.

The Chivateros lithic material has many interesting and diagnostic attributes and it would be impossible to do a complete evaluation of all the features in just a part of one afternoon. I made a few brief comments on features that were of selfish interest to myself as a toolmaker and this, of course, represents only a small part of the overall picture of the Peruvian collection. If my hurried and personal interest evaluation left a wrong impression and I failed to properly clarify them, I am indeed sorry for I do not like to be responsible for giving Ed the wrong impression. Bordes and I had a similar problem arise at the conference in Les Eyzies when we ~~we~~ both agreed that the lip on certain flakes was the result of the worker using a billet. Some interpreted this as meaning that every time a lip was present on a flake this meant the worker used a billet which simply is not true. We have seen this in some of the literature and have discussed it but have just had to live with it and try to explain the difference when we have the opportunity. So it happens and I am just sorry that I am not more explicit and hope you will not hold this against either of us. Hopefully more extensive writings on technological traits and their variations will educate the unfamiliar with the exceptions.

Do hope you and Dick can get out this Summer to stay with us, look over some of our sites and break a little rock together. We would be most honored to have either or both of you. I am impose on you to pass your opinion on some hand axes I have made and other tools.

Sincerely,

Don E. Crabtree