Route 1
Kimberly, Idaho

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Dr. V.D. Frechette
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Dear Dr. Frechette:

Thank you for your letter of July 29th and I am most indebted to Vance for this most welcome introduction. Your technical paper is most appreciated for it will be of much help to me in a similar work I am doing. To my knowledge, you are the only one that shares this mutual interest. My approach has been slightly different, but parallel to yours.

I have just completed a paper on Lithic Materials relating to the flaked tool industry and as soon as the editing is complete, will be happy to send you a copy. Our interpretations of fractures of isotropic materials is much the same and I feel our interest is a common one. I have been attempting to relate stone working techniques and tools to types of fracture, as the fracture or flaking and flake scars remain comparatively constant when the conditions are the same. Certain techniques of stone working are pertinent to particular groups of people at certain periods of time in different geographical areas.

The isotropic qualities of stone or glass can be compared to a solid with the properties of a heavy liquid or vice versa. My problem in replicating artifacts has been to control the wave mechnics of this material and produce, at will, flakes of uniform thickness, length and width. When this is mastered, one can duplicate most any aboriginal tool type. Flakes are parts of cones and the angles of the cones afford an interpretation of the angle that force was applied.

Upon the application of force, the molecular movements create strange patterns that you call "hackle" (which is a good word). The only word I could think of to cover this was striae or fissures. I called them fissured because at the margins of the scars on both the flakes and cores they point to the direction of which force is applied. Or, comparing these fissures to a glacier, they point up-hill and usually at a forty-five degree angle, while the ripples radiate away from the uphill side - or, with a flake, from the point of pressure or percussion. The gull wings are most interesting and the word is most fitting and descriptive. These often occur when I am removing blades by pressure from an obsidian polyhedral core. Foreign matter and tiny amigdaloids seem to obstruct the molecular flow, causing these tiny eddys around the object with the belly of the gull being toward the point of force, or up-stream.

After forty years of experimenting with fractures, one can't help but observe the hackles and fissures and the types of breaks made under certain conditions. The types of material are most interesting. Some seem to have more elasticity than others even though, by eye, they appear to be the same. For instance, different obsidians react quite differently under pressure. The grain or particle size seems

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to have a direct bearing on the viscosity. In other words, the coarser the material, the greater the viscosity. I amy be off-base to make reference to Lithic materials by referring to their S.A.E. rating, but I would like very much to have your reactions to this trend of thought.

I feel an intensive study of wave mechanics of solids with isotropic qualities would be most useful to Archaeology and other sciences.

There are so many questions I would like to discuss with you on this subject. My conclusions are based on my flintworking experiments and are out of the confines of a laboratory. If one had the proper equipment to study this material with the aid of polarized light to observe the bifringence, much knowledge would be added to the behavior of isotropic materials under stress.

I am just finishing up a paper on the Mexican Polyhedral core and have a deadline to meet. Therefore, as soon as time affords, I will send a core, blades and artifacts for your interpretation.

Thanks so much for all the information you have given me and I do look forward to meeting you personally at some future date.

Sincerely yours

Don E.Crabtree