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- Epstein: Can I have an answer here as to why I should think that this is just an intermediate step to something else as opposed to the finished product. Is there a ground projection, or is it just purely the sort of thing that I know deep down inside that this is not finished.
- Bordes: No, that is not right. That is the state in which I leave something when I don't want to finish it now. That's all. That is the only reason I have, but it is at least ~~another~~ ^{one} reason. On the other hand, you say to me that's a finished thing. Perhaps you are right, but give me your reasons.
- Crabtree: May I help a little on this? I don't know if I can or not. But maybe, Gerry, instead of cutting sharp and fine lines between whether it shows pressure retouch or is a finished percussion tool, we should consider that, generally, a preform is roughly percussed to the shape the worker wanted the finished artifact to be. This work could be done at the quarry to save transporting a lot of material to the campsite or workshop for final finishing. The design of a preform also shows that it is adaptable for further thinning and completion. Sometimes you can see, perhaps, some functional use on the edge or indications of a little retouching. This can help to decide if it is a preform or an actual tool. Like Dr. Bordes said, with a few blows, one could straighten this out, therefore, it appears to be incomplete. They, possibly, were in a hurry to bring in their material in this form and later on to finish it. Maybe this will help determine if it was a preform, or just very crude, roughed out blanks. Some are a little more finely finished at the quarry, so there is a slight variation in preforms, unless there are indications that perhaps did show function. Could be they used their preform for some purpose to show these scars.
- Epstein: Fine. Now what I am concerned about here is that some of us may rush back here and start calling all bifaces, that aren't strictly on this level - blanks or preforms. Suppose then, we talk of these as thin oval bifaces with this kind of flaking on it. This kind of thinning flaking. Long pointed bifaces with this kind of flaking on it, and specify the flaking quite specifically.
- Crabtree: Before one does that, Gerry, it would be well to very carefully check the edges to see whether this could be a digging tool. There is no purpose for a pressure retouch on a preform and, certainly, we cannot call all pieces that don't have pressure retouch - preforms. There is quite a wide difference between the percussion technique for a preform and the percussion technique used to finish a tool. It may be finished as far as it will be finished by percussion and be a completed tool. Let's not use pressure retouching as a diagnostic trait to determine the difference between a preform and a tool. It may even have a functional retouch from rubbing one way or the other which would indicate the manner in which it was used. Close examination of a preform roughed out by percussion will show that it was left at a stage of final finishing by either pressure or percussion. Thin, oval bifaces usually are not designed for, and will not

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permit, further thinning - only edge retouch for sharpening. One really needs an assemblage before final analysis may be made. I'm not saying this well.

Irwin: One other aspect of this problem is - I mean you excavate these sites where people have been fabricating these objects, and you quite often find both halves of an unfinished object whereas a projectile point - notice here that we have all bases - well, that's because they lost the tip while hunting. They took the shaft back and made another one. But with these blanks, they were in the midst of the fabrication and this is true of this point which you notice is not edge ground because it was not finished. It was broken before they finished it. Almost invariably a point that is finished is edge ground - this seemed to be one of the Paleo-Indian characteristics. This point also, which is not finished, is not edge ground.

Irwin
Williams: In the same line, it may be interesting to note that among the workshop materials that we do get from Hellgap, we do find these rude fine-grained stones, very much like that grooved piece that Don had, for grinding the edges of projectile points or for grinding the platforms for further work.

Byers: May I take a piece of this. This large piece that Gerry was talking about particularly, as to whether this was finished or whether it isn't. There are enough ethnographic specimens that have been found with wrapping around them to make that a perfectly good semi-lunar cutting knife, which is widespread thru the New World with an edge no straighter than that, but very jagged because it had been chipped. And as far as this is concerned, we have a piece from Teotihuacan that isn't finished as well as that, but it is already hafted - has a handle. Looks like something that no one would pick up.

Bordes: Yes, that can well be, you know. That can well be. But, on the other hand, you know, you always have lazy people who did with what they had until the end rather than to work. It's as simple as that.

Byers: This is simply American informality.

Bordes: I really don't think so, you know. I don't think so. When you see the lots of pains it took these people when they really wanted to finish something. For instance - where is it? This and others and the bit of laurel leaf; this, this, and this, there is no question that it is finished. But this strikes me as something which is not quite finished - with, oh, about five minutes more of work and that's all.

Irwin: Well.

Bordes: You can cut with that. Of course you can cut with that. You can cut with almost anything. We can cut also with a crude flake without any retouching. You can haft also. Have you seen some of the things which have been hafted by people in the Pacific - Australians and so on. Any flake. But, anywhere, it is a flake.

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- Irwin: Well, one thing you get in this, is if you can find all of the production stages - that is, if you can go from this blank, so called, or from a bigger one you can go from something like this to something like this and to something that gets a little more finished like this - and to the final point. You'll notice the form is kept reasonably similar. With these things, I don't know.
- Bordes: Well, you can -
- Irwin: The thing is that these are - just to confuse the issue a little more - specific of one horizon which, unfortunately, does not include any of these. So, maybe they kept on sharpening these and chipping them until they became something like this. Maybe they started using this -
- Bordes: No. I won't say that this is a preform for that. I will say that this could be a preform for that, which is a quite different shape.
- Irwin: So we don't know. We would have to find one hafted, I think, to tell. But with something like this, there is no question, Gerry, that that isn't a tool.
- Bordes: Yes, I think so. Except, do you really think that putting this as a long bifacial tool, with such and such type of scars and so on, will give you more information than to say no, he didn't finish the point.
- Epstein: No. Yes, I do.
- Bordes: I don't. I don't.
- Epstein: No. What I am very much concerned about here is that - here Dr., I mean Mr. Crabtree - we'll have you elevated to Doctor status before the meeting is over.
- Crabtree: Drop that point.
- Epstein: Crabtree has certainly shown that we can get a tremendous amount of information out of this material by studying it extremely carefully. Much more carefully than we have ever done before.
- Bordes: That's another thing.
- Epstein: All right, but I think there should be one case here to distinguish between a judgement and a fact. And, when we call this a blank, and when you call any of these things blanks, you are making a kind of judgement which I think is very dangerous. And I would like, here at least, to say you scare the daylights out of me.
- Bordes: Well, I want to say something about archaeologists passing judgement. After all, this passing of judgement is not archaeologists - it is catalogue. And I have seen too many dumb, bloody articles which are just

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catalogues. So many points of such lengths and such matter and so on and so forth that go on and on and, in the end, you know what - nothing.

Irwin
Williams: You call them laundry lists.

Jelinek: I would like to say something.

Bordes: Yes, go on. Shh'

Jelinek: Hello! What I would like to say is that I think part of this problem concerns the fact that you have done considerably more analysis with stone material over here; your typeology is worked out more clearly over here, and, in America, we are just beginning this kind of analysis. And I think that Epstein's emphasis on a more descriptive terminology reflects the fact that we need more description in looking at this material and keeping track of it at this particular stage of analysis in America, and later on, we are going to be able to work out a terminology that would help.

Bordes: I understand this quite well. I wouldn't say that what Epstein's saying is wrong, you know. But I would say that first when you speak of this tool in your first report, or in your general report, you say one and finish it in point. And then when you get into the technology of the making of the points at one particular site, you can go to any measurements and consideration of which facet if you like. That's something else. But I don't say we have something to win if each time you have to mention this point - you have to say, in your report, a bifacial tool much more longer and this wide with such and such type of flaking, you know. That would be a convention.

Jelinek: I think that, initially, if you are describing an Eden site, that you need the measurements and statistics on each of these things and, once several of these sites can be analyzed, then we can go ahead and say, after that, well, we know now from our previous analysis, that this thing is more probably an unfinished Eden point.

Bordes: Ya, Ya, ya.

Jelinek: The more material we get, we can do it.

Bordes: All right. You are right up to a point. And you are certainly right up to a point. But, on the other point, I am very much afraid that this will lead to some kind of work I have seen done this summer in a certain shelter not very far from here with about 20 measurements to show that this was longer than it was wide. That's very dangerous up to a point, you know.

Jelinek: We don't have that much time.

Irwin: The point is that - that is longer than it is wide, of course.

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- Irwin
Williams: I wonder if either one of you would like to comment on the possibilities of some of these points being made on flakes rather than by reducing a core technique or by reducing very large thick flakes. There are some that we find of which this Agate Basin is not a terribly good example - unfinished ones which do show fragments of striking platforms.
- Irwin: I don't know about that one.
- Bordes: I'm not quite sure.
- Irwin
Williams: This is not a particularly good one.
- Bordes: It could be. It could be.
- Irwin: Yes, you do get this certainly with Lindenmeier. We don't have enough to tell. In general, this end of the Paleo-Indian horizon was done from core, but, with Lindenmeier - and if Bordes sees the Lindenmeier collection and Don sees it - you will see that quite frequently you have the Folsom points made on a large flake - somewhat larger than that, actually, and there will be the bulbs of percussion - quite often ground, like this. And then, in addition, they put a little more grinding on it apparently for that support. The one example that Marie brought doesn't show that because it is a little bit later on in the thing. And, of course, then often they would break it. The Lindenmeier collection has a number of these. That's one of the differences in Folsom and this stuff.
- Crabtree: This one is certainly suggestive of that sort of thing.
- Tixier: I think here we can see bits of biface.
- Bordes: Ya, I think so, I think so, yes.
- Crabtree: Here is the natural face of the proximal end of the flake. That is good observation, Cynthia, that that is the flake and this could be from a flake and with a very flat platform and is quite unusual with this facet of the original portion of the natural surface.
- Irwin
Williams: This one, I might add, an unfinished point in mint condition without the grinding on the face.
- Irwin: No grinding?
- Irwin
Williams: And it was found along with a couple of other unfinished points in a workshop area.
- Bordes: I will tell - that in the Solutrean anyway, many of the laurel leaves are made on big flakes because it is rather wasteful to begin on the core to make a laurel leaf and you have a lot of more work, but sometime when you find - how do you call it - slabs of material, then it is all right.

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You can go from a core like this one for instance, directly from a core technique, but to really make such a fine thing - taking a big lump of thing like that - it is a waste of time and work. And it is less easy.

Tixier: It's more easy on a flake.

Bordes: Right, it's more easy on a flake. This one could also be.

Tixier: Could be. Looks like made on a big flake. A symmetrical cross-section.

Bordes: I wonder. I wonder if this is not a little part of the original face.

Tixier: On the big flake there is no little waves like in the retouch pressure or retouched by percussion.

Bordes: Of course, you can start from this one on the very big flake we had before. I could make some kind of thing like that on one of the big flakes I have - I made.

Irwin: The material outcrops locally in tremendously large nodules, 10 to 15 times as large as the flint nodules as you have been working.

Bordes: Ah, yea.

Irwin: This was mined. They had a technological mining procedure. They were able to go after the beds of this type of chert. (Reel 9 - Side 2)

Bordes: No question. They made big flakes first.

Crabtree: I wonder whether, Cynthia, perhaps meant with this one ^{a flake} whether this was a blade technique, a small blade technique rather than ~~because~~ there is no way that you can tell with a big tabular piece of stone.

Irwin Williams: Well, no I did mean a flake as much as a blade but this is possible.

Irwin: You could get a point like that out of this blade.

Bordes: Ya, if the material was better.

Irwin: If it was a little better stuff.

Irwin Williams: The point is that we do have somewhat better examples that do look very much like blades. We do have points of this kind. In fact the other point found with the same one, made apparently on a blade with one flat face, quite ~~in retouch~~ ^{still} ~~unretouched~~.

Bordes: By Jove, that's not a typical scraper. Is that what they call a typical scraper?

Irwin: Would you not call that a little more of a little truncation on that.

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- Bordes: Ah, no, that's not a truncation.
- Irwin: Not steep enough.
- Bordes: Not steep enough.
- Irwin: I might add to point out one other thing that is interesting about this. You saw some artifacts of this material in the stuff Marie Wormington showed you. This is primitive treated at best apparently it occurs in North Dakota, I haven't been able to find the other location of it.
- Bordes: But I have seen such material in Old World too. Same kind exactly.
- Irwin: Ya, there may be more than one locality in America I don't know. I presume there are more.
- Bordes: I mean in Europe they have things like that same material.
- Irwin: This particular batch comes from North Dakota, it occurs in Alberta, it occurs here, and it occurs down as far as Clovis isn't there two or three places in Clovis?
- Irwin Williams: Yes, there is.
- Irwin: And they traded quite widely for it. It's interesting to notice that when we get artifacts of this material we rarely get blades. We have small sections or refinished tools.
- Irwin Williams: We have perhaps seven or eight flakes of the same material but almost the same number of finished artifacts, apparently was a desirable relatively widely traded material.
- Bordes: That's also an end scraper. That's interesting. That's a scraper, all right. Retouch^{ed} blade. Oh, yes.... Oh, yes, that is sloppy looking.
- Irwin: Don, do you want to say anything more about heat treatment?
- Crabtree: That one is the most obvious. It shows the original facet of this side prior to heat treatment. Others possibly indicate they were exposed near the surface which changed the color. It's quite obvious that that one was changed. Some of the finished ones are very indicative of treatment but, without the original surface for comparison - one cannot be sure. Unless you can find some of the original facets, it is hard to tell.
- Irwin: Find out if we can see something.
- ~~Bordes:~~
Irwin Williams: One of the factors ^{mitigating} ~~mitigating~~ against this is the fact that there is a very good quality of flint, or chert available locally and there really wasn't the necessity for heat treating.

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Irwin: This is some of the stuff then that was brought from up state.

Bordes: Very good. That's not bad at all, not bad. Well, how many other collections have you to look at? You again.

Madame Bordes: But, of course, me again.

Bordes: Okay.

Wormington: This is some of the Western material.

Bordes: Okay, all right. We have a limited time.

Wormington: We have some Folsom material from New Mexico.

Bordes: Okay, we have a limited time up here.

Joe Ben Wheat: The material here is from three different sites. One of which is...

Bordes: What the hell is this?

Joe Ben Wheat: The material here is from three different sites. The earliest of which is a Folsom site near Vanhorn, Texas, and the Big Bend area. Actually the site itself is a multi performance site. All the material, so far, is from the surface, but there are several occupations of this from the Folsom site on out thru varieties of parallel sided projectile points and so forth into an Archaic horizon and finally up into a late pottery horizon. From this site, I want to make a point of this, because from this site we have about 300 of the little snub nosed end scrapers and normally anywhere in the Plains one will say that these could be any age. At this particular site, I have pretty good reason to believe that they are all concerned with the Folsom horizon because I have something close to 15 or 18 thousand specimens from this area, and I have no snub nosed scrapers from any other site, anywhere in the area, until we get to this Folsom site. I won't say I have none, I have two actually from other sites. So these snub nosed scrapers almost certainly belong to the Folsom horizon. Now the Folsom material, most of which I have brought here, I have selected out of a total collection because many of the pieces show the evidences of manufacture. There are a number of various steps of fluting. Many of them were actually broken in fluting. And I also have one or two odd-ball pieces which looks like something they were practicing on--learning how to flute a point. As you can see the original side of this has no particular significance but there is nevertheless a good form and a flute started. These are channel flakes and a number of small, what we would call, graters, there. But they are obviously little drills and so forth. Burin flake this could belong to any horizon. Possible burin but not a very good one, if it is. And these projectile points, most of them are later in time. Notice

the pieces which were going from the stage which Marie showed this marking through various

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that there is one here which has a burin on it. Yes, right here. Now this is an Archaic period point. Some of the others have been battered around. Shall we take this first and then, well I should mention this material down here. These cores and other bits of blades and so forth here, most of these are from the same site as the Folsom site or close to it. At least they are representative of the same type of material, hammerstone type of thing, which shows a secondary usage of a core and the double-ended scraper or side-scraper and some flakes and so on. These are all typical of the Vanhorn area and apparently are also typical of the Folsom horizon. This, of course, can only be finally established thru excavations there. So I'll turn it over now and then we can come back to these sites later on.

Crabtree: Dr. Wheat, which was the example that you would like to take first in this first group?

Joe Ben Wheat: The Folsom points and the ones which were broken in construction. Most of these down here.

Crabtree: This first one that I picked up is particularly interesting. We are just preparing to do fluting one side by pressure and one side by percussion, with Dr. Bordes doing the percussion. I have a similar example on the shelf over there, it is the same sort of a preparation to support between the tip and the base as the flake is detached. And so he didn't bother to change the platform preparation from one side to the opposite side in order to remove a flute from this side. It's difficult to tell the type of breakage here between the base and the tip but, no doubt, there was a bit of flexing of the fluting flake and, therefore, the artifact broke. These basal portions do not appear to have been broken in manufacture but were apparently broken in the field.

Joe Ben Wheat: Yes.

Crabtree: However, there are several here that do indicate that they were broken by the hinging off of the channel flake and this particular flake indicates it hinged off at the end of the fluting flake. This has been a problem of mine for years-to stop end snapping, and I find one must use a particular type of tip support to prevent this break. Several of these stubby small ones in these three groups show the fluting was done first without shearing the ends and then the retouching done afterwards showing a very distinctive overlap of retouch on the channel. The fluting removed the tip first, but it was then retouched to rejuvenate the point. Undoubtedly it was originally much longer. You can see, the intersecting scars between the tip and the channel scar where the retouching was done on these short ones, Folsoms. This broken point is peculiar. No doubt it was broken by being stepped on. After it was broken it was reworked. There is no scar evidence on the edge of this side showing, in this particular case, that this Folsom was made on a blade. Whether this is characteristic with the whole group, I don't

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know. This one from the flake scars of the outside surface, shows the flake was reutilized as some sort of a scraper certainly it was not intended to remove another flute. But, they had thinned this maybe for sharpening. It's a little unique, this sort of a thing. But it shows some sort of a reutilization of these tiny points similar to other specimens we saw. The direction of the functional scars show how the tool was used. As Dr. Tixier and Dr. Bordes will observe, all flake scars are from one direction. A good example of a reutilization of a broken Folsom projectile point. This one shows a peculiar break. This side shows the flute splitting the platform because of a crushing of a cone. It apparently was fluted on one side and broken when fluting on the second side. But, this sharp edge may even indicate a sort of a burin break on his square ended piece. There appears to have been a softer tool used to remove this type of flake. The heat treatment is quite obvious. We get this typical sort of a break from the collapsing of the platform. However, the fluting looks like it was successful, but the channel flake split. This one was not successful; it came off the edge as the second flute was removed and it collapsed either from being held and gripped too tightly due to the extreme thinness of this particular point. We can move on to these others. One cannot be sure of the preparation but it shows the general method is polishing the platform to give it sufficient strength to support the tool and the necessary forces to detach the flute. Unhappily, most of the specimens are the center sections of the channel flakes, which are not as diagnostic as the proximal ends. This shows a wide range of material was used. This one appears to be polished on the basal platform to withstand the pressure. There is a difference between grinding and polishing. Grinding lets the flake dislodge more easily, while polishing gives the platform more edge strength to withstand the force needed to remove the flake. The base of a core that is ground has a much weaker surface than when it is polished. So there is quite a pronounced difference in a flake that is polished and one that is ground and abraded in order to free the flake. Grinding and polishing is usually done on a flat top surface. The grinding shows as the platform of this flake while this one is rounded and polished. The difference between the two is apparent. With the cores I don't polish the platforms, but I do grind them. Apparently, almost a complete utilization of the core here, Dr. Bordes. I don't know whether there is anything distinctive left in the core. The flakes may show some character on that side. This appears to be a big side struck flake. A collateral flake with a hinge fracture at the distal end. It had to be struck from the side to produce this distinctive type of flake which is very adaptable for a big scraper. Not a Levallois type of flake but the basal portion has a similar thickness that is comparable and shows a slight retouching of the platform. Yes, with a flat surface and a conical core.

Levallois

Bordes: If it is a core, I am not so sure.

Joe Ben Wheat: We also get pulping planes in that area which look superficially like this and you have to examine the bottom to see where the wear on the surfaces are.

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- Crabtree: Oh, Yes. I see. With this array all I can do is oh and ah. I have never seen anything as exquisite as this particular piece. It appears to have almost been ground out, but there is no mechanical way to produce this beauty. We know that it was preformed in several stages and probably several techniques were used to give it this final character of beautiful uniformity, feathering of the edges, and the edge character of spacing of the flakes and yet to leave the median ridges and edges straight. This is indeed one of the finest works of art that man has created and Joe Ben has an artifact that compares with painting, sculpture any of the fine arts.
- Joe Ben Wheat: Did you notice that you are speaking before of retouch on the edge. Did you notice the retouch on that?
- Crabtree: Extremely good! The type of material is similar to Sweetwater agate and the amount of labor that has gone into making this a beautiful artifact would make it almost a sin to use it as a projectile point.
- Joe Ben Wheat: This appears to be another one of the big preforms. The base of one of the preforms such as Henry got at the Hell Gap.
- Crabtree: It's very exquisite work and very distinctive. It shows a very distinctive technique.
- Irwin: What site is that?
- Joe Ben Wheat: This is the Claypool.
- Crabtree: Dr. Bordes.
- Bordes: Well this is Bordes speaking. First of all this Folsom material it looks as if the biggest state no the second state now has also the smallest Folsom, because there are some here which are really small. Anyway they are beautiful.
- Joe Ben Wheat: Just a flake.
- Bordes: Yea. As for other comments I won't say much. The scrapers are ordinary kind of scraper that we have already seen in other places, but here about the burin. This is a projectile point probably; I should say that it is a bifacially worked broken tool. Which seems to have had a burin blow from the break. I wonder if it would be interesting to experiment with points and see sometimes if the fracture break could not give us at times this burin blow. I am not sure, not at all. Just an idea, I throw into the air and let it hang. But there you have ~~something~~ ^{the artifact} and on two sides *Looks very much like some burins which have been done by silurian and Solutrean* broken Laurel Leaves, so it could well be burins after all. Well that is more a kind of a splintered point, basically. Or it could be just, no I don't think. It should have been something very odd to make that.

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No, that's a little borer. I don't see others.

Joe Ben Wheat: What comments do you have on that one? That's one not on the breakage so much as the flaking itself.

Bordes: I leave that to Crabtree who is better than me on this what material?

Crabtree: It looks like a very fine pressure flaking and it shows an entirely different technique than any of these. In fact in this assemblage, this is quite a distinctive piece and the character shows a distinctive style of flaking. *Is this common, Dr. Wheat.*

Joe Ben Wheat: ~~Is this common?~~ This is the only piece that I have like that from this site.

Crabtree: It seems unique.

Bordes: Yes, well, you know there is a lot, ^{actual} in fractures ^{ing of} these burins or perhaps double burins, I don't know, ~~But~~ there is a lot. And this one is amusing. If it is a burin it has been made in the same way as Alaska burins that we have seen. Not on a true truncation but something which is almost bifacial retouch before that, the burin blow. Well, about the other things, I have not much to say, there are nice ~~burins~~ ^{features}, ah yes here. Crabtree what do you think of this? ~~Is~~ ^{Was} this big flake taken off by pressure do you think?

Crabtree: It appears to be unless it struck a rock at a diagonal angle it could have removed the flake by the percussion blow. But as it slid through it could have caught from the weight of the shaft and been given this sort of a flake scar.

Bordes
Joe Ben Wheat: This was actually in a buffalo. *set could be*

Bordes: Is that so. Well, with striking the bone like that. Striking the bone or as I have seen when I was young practicing bow and arrow, my arrow touching the surface finding a rock and jumping again and going to bury itself in a tree. So it could be the ~~how~~ ^{blow} as it went into the soil before getting into the buffalo.

Crabtree: It doesn't appear to be an intentional sort of thing that they were doing.

Joe Ben Wheat: No, its from hitting the bone, I am fairly sure. Did you notice this one? Look on the other side it's more obvious.

Bordes: Looks as if there has been two sets of retouch with a different ^{aspect.} ~~aspect.~~

Joe Ben Wheat: This one has become partially patinated and since it is evidently the same type both before and after, it evidently was found and picked up again somewhere and then reused, resharpened and reused.

Bordes: Looks like yes.

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- Crabtree: Notice the change in technique on here. I mean it's a random sort of thing like that, compared with the uniformity of this.
- Bordes: Ya, that is good work in such a material.
- Crabtree: Basalt is tough.
- Bordes: But, that is very beautiful, but it is so regular that it becomes almost mechanical. I must say that that is a beautiful piece of work but, I must say that the general impression is less striking than some which are less beautifully made but more human.
- Irwin: It has a dramatic touch to it.
- Bordes: No, it has a mechanical touch.
- Joe Ben Wheat: Notice the range in size in points from one site. These are all from the same site. These would be considered blades, I presume, or are these simply elongated flakes.
- Bordes: I am not sure, no I think that can be rather a flake.
- Joe Ben Wheat: Yes, well that was my impression.
- Bordes: A flake of first workings of bifacial things. Sometimes you have several blades like that. Well let's see here. That one here is very nice, very fine side scraper and it seems they were vicious enough to apply pressure flaking for making side scrapers, you know. They were certainly pressure people. That's another flake of making bifacial tools. That's the same thing. That is more like a blade. This one too, also. This one is certainly a blade. Ah, that has something on it, yes. That, you know, seems to be a kind of tool, because it is much too regular to have been just a preparation or a striking platform but anyway I don't see what they could have hoped to take from ~~that~~^{here}. This is a little flake, I don't think. That here. Is this very common with your scrapers?
- Joe Ben Wheat: Not common. You mean this removing of the bulb?
- Bordes: No. Not removing of the bulb that not removing of the bulbing you know. We find this often enough on end scrapers, not very often, but scraping edge - A regular scraping edge or utilization like that. I have done it by trying to polish a regular scraper like that something like that. Well, this is a spall and not a core I think. Rather a kind of rough grade of tools. That's a kind of Levallois flake with a what I call scraper with flat face, but it can well be a knife. Because it give a sharp edge. These are cores which are not very good. This kind of Mousterian we call.
- Tixier: Tixier speaking. I think that there are two sorts of gravers you see, there is gravers or ~~cores~~. *barers*

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- Bordes: I don't like this word graver.
- Tixier: Graver, borer.
- Bordes: Graver if you like but not graver.
- Tixier: These borers with an abrupt retouch, you see like this one, like this one, and others with beautiful semi abrupt retouch, you see. It's quite different. Here is abrupt retouch and here is a semi abrupt retouch. And here is a little bit of channel flake. I think these here, the back face of the blade and then the retouch of the edge and then the flaking out, flaking off of the channel flake. I think it's another observation who make me thinking that the Folsom points or fluted points were made on blade or on biface.
- Crabtree: This is the natural facet.
- Tixier: This is the natural facet.
- Crabtree: I mean from the original large flake on that there side.
- Joe Ben Wheat: Oh, yes that's not a stem. They just didn't take out the center.
- Tixier: And this is a very good burin spall with a retouch before striking off the spall perhaps coming from another burin. This is a burin but not very very good. Yes it's one. Yes it's good; it's good. It's on a little truncatur^e.
- Crabtree: Any further comments from you, Dr. Wheat?
- Joe Ben Wheat: No.
- Crabtree: Anyone else?
- Alan Smith: Don, would you like to try that channeling now?
- Crabtree: We can do that. It will take me just a few moments.
- Cynthia Irwin Williams: We have here a collection of late pre ceramic materials from the Southwest which are of interest principally because they very likely represent the antecedence to the Anasazi or Pueblo culture. I've got them arranged more or less chronologically, so that we have at the other side of the table here, the San Jose culture, as it has been called in New Mexico, which probably has a date range around 1000 to around approximately 3000 B.C.^{up} The crude materials to the left, unimpressive as they are, seem to make the most of these peoples chipped stone assemblage and I brought a representative collection primarily of the actual tools scraper, scraper planes, choppers, and things of this sort, and also of some of the crude flake tools which go along with them. Some of the cores from which these were apparently

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struck when silicious material relatively fine grained sort was available, and also some pieces made on this rather coarse basalt. Over to the right there are a series of projectile points from the same time period and these, of course, occur with a large number of grinding stones so these peoples main concern was for seed grinding rather than for the production of gorgeous projectile points. The material closer to me here, apparently represents the successors of the same groups and the same area, the development in projectile points styles and development in chipping techniques. I think that it is quite obvious that there is considerable improvement in the kind of simple tools made in the late periods and there are apparently some blade-like objects of the same period. Now right in front of me there is a big collection of sharp looking flakes which do represent, I brought along just because they represent a workshop, small workshop area probably from one or two pieces of obsidian from this later period and this is they are just sort of representative of the kind of the kind of stuff that we were getting in the flint bit there. One man or so sitting there and chipping for an hour or so. They probably are somewhere in the 500 B.C. range approximately. Down at the bottom here, just to indicate what this stuff develops up into of a basketmaker to a projectile point, and this is almost certainly what becomes of the culture ultimately. Now I don't think that I will go into the typology anymore. That isn't our primary concern, so if either of you would like to comment on this why you might as well start.

Crabtree:

Thanks, Cynthia. With this array of ^{flakes} ~~flakes~~ we start in between in here. These are not even as good as those in our working pit. We find something characteristic of obsidian in here and we have a lot of the distal ends that were broken from the shock as they collapsed on the end. For instance, there seems to be almost no platform preparation. Very little control of flakes. This one they did take advantage of the ridge to thin these down. This one appears to be a nice thinning flake and probably one of the best examples ^{of this type}