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Orwin Do you get loma crest, Phil?

Phil Smith

No. Well, yes, I do but not enough. This ~~you start~~ <sup>Quicheta</sup> a retouch, as Tixier

mentioned a few minutes ago, it's present on a good number of these also. Just what this industry represents is a bit hard to say now, but Mr. Tixier and I are

having a slight arguement about this. He prefers to call it a kind of ~~Herrian~~ <sup>al bers</sup>

~~Maurusian~~ ..... <sup>maurusien - Nile Valley al bers maurusien.</sup>

I don't see quite eye to eye <sup>with him</sup> on this.

~~I want~~

Tixier

There are four kinds.

Bambier

(In French)

Phil Smith:

There are no micro burins at all in this industry <sup>and</sup> not a single geometric.

It's entirely different from previous forms.

Bordes

Looks like.

Orwin

Does this ~~... appear~~ <sup>occur</sup> locally, Phil?

Phil Smith

It seems to, yes. You get ~~your~~ <sup>it</sup> in ~~your~~ <sup>the</sup> limestone depositis.

~~It is~~

(In French)

Bordes:

An odd kind of Capsien

Orwin:

Looks pretty much like that bunch..

Phil Smith

Yes, it does, <sup>yes it does</sup>

(In French)

Ca. 25.3.7.1 (18)

Phil Smith

O, K. Now one last questions. Do you feel that this is a burin-<sup>flat</sup>~~pointed~~? This

one here. Double burin <sup>flat.</sup>~~point.~~

Bordes

Could well be. There is a nice burin on the percussion here. It could be two

yes, yes, yes. Could well be, yes. Probably ~~several, several~~ <sup>a triple</sup> burins. All right.

Phil Smith

We~~ll~~ have finished with that one I think. This came from what was more or less

a surface site ~~It~~ seems to date to the late Pleistocene but, so far, I don't have any

definite radiocarbon date for it. This industry was identified or found by Venoir

about 40 years ago at Colombo he called it the <sup>aurignacian</sup>~~Orignacian~~, ~~when~~ he got around to publishing

it about 10 years ago, because of its typological resemblance to the European

<sup>aurignacian</sup>~~Orignacian~~. There is no question in that it does resemble the <sup>Aurignacian</sup>~~Orignacian~~ in some ways

although I won't call in <sup>aurignacian</sup>~~Orignacian~~ publicly. Well, the fact that I found some

engraved Venuses on <sup>the</sup> cliffs just above this made <sup>the situation</sup> ~~it~~ even worse as far as Messr. Venoir

was concerned. Now he is all in favor of direct migration up the Nile Valley

from <sup>(Rubisere?)</sup> ~~....~~ There are knobby cores ~~very~~ almost no blades cores, true blade

cores. Some have been reworked into steep scrapers of kinds, almost carenated ones.

There is a huge proportion of scrapers of all kinds in this industry about 50 %

steep, some carenated, <sup>on the</sup> ~~end~~ of blades. end of flakes and also some side scrapers.

Just these retouch blades, <sup>lamell triangle</sup> ~~....~~ almost, which do resemble some of those found

in the Antelian the so called <sup>aurignacian</sup>~~Orignacian~~ of Palestine.

Bordes

Why so called?

Phil Smith

We'll talk about that later. We have been agreeing about that for 5 years.

Ca. 25.3.7.2

There are very few burins, no mico liths, ~~no micro liths~~, no micro-burin technique, and, at the present time, the whole thing hangs in the air <sup>as far as I know, it hasn't</sup> been found elsewhere in The Nile Valley up to the present time. I think it's final Pleistocene around probably, according to <sup>its</sup> geological context, <sup>probably</sup> around 10,000 11,000 B. C. But I have to wait until I get a couple of hearth charcoal samples run before I'll be certain of that. Tixier do you have any comments?

Tixier. no comments  
Bordes!

The only thing that I can say <sup>is that a</sup> we have seen, last Spring, some of the material <sup>from</sup> what is the name already, <sup>the</sup> big site in <sup>Lebanon (Zorogua) esp.</sup> Lebanon, ~~Zorogua~~... and some of the <sup>real Zorogua</sup> Zorogua

not only the <sup>aurignacion</sup> like tools <sup>but</sup> exactly the one of the <sup>aurignacion</sup> Russian. <sup>So,</sup> Perhaps it has no <sup>genetic</sup> geological connection with your <sup>aurignacion</sup>

but it is a little ~~of~~ difficult to call it another name. You know, because if so we can go very far and say that the horse of North American wasn't a horse because ~~there-~~ they were ~~not~~ in North America. You know, not only when you say some special feature ~~at~~ right, but no more or not much more than you could find between two .... <sup>for instance,</sup> <sup>aurignacion</sup> of France and one of Germany. It's even much closer to the <sup>aurignacion</sup> ~~origin~~ of France <sup>and the (Acollere) of</sup> <sup>for instance</sup>

and the same collection of tools .... which is exactly <sup>aurignacion</sup>  
So there is a problem of this Near East <sup>aurignacion</sup> ~~origin~~ between quartz, if you ~~like~~, but you know that old story about Shakespeare. Next one I think perhaps.

Phil Smith

The next one represents the <sup>Sivillian</sup> ~~Sivillian~~ industry which Venoir found at Colombo about 40 years ago. Yes, the whole thing. This is the middle <sup>Sivillian</sup> ~~Sivillian~~, most of this

Ce. 25.3.7.3

is the late ~~Sibillian~~ <sup>Sivillian</sup> which is more micro lithic. Unfortunately I forgot to bring

along some cores or some nuclei for ~~Middle Sibillian~~ <sup>the Sivillian</sup> but some of these here give

a <sup>fairly</sup> good idea. It's an industry which starts out very much in the Levallois tradition.

and then gradually loses it ~~and then gradually~~ although it never quite disappears

At the very beginning, and there are very few of the early sites known, it seems

to be hardly distinguishable from a Mousterian, Mousteroid type of industry. At the

end which comes at the end of the Pleistocene and the beginning <sup>(the 10k4)</sup> of the Oligocene, it's truly

micro lithic using the micro burin technique. They made a great many geometrics

and blades, but still a small proportion of the Levallois core. In some respects,

in fact it's kind of a second cousin to this industry, I described at first but

typologically it quite different. Technologically it's somewhat the same. Typologically

it is completely different. There are absolutely no burins ~~found~~ found in the

~~Sibillian~~ <sup>Sivillian</sup>, only micro burins as far as my experience at Colombo went. The most

distinguishing thing about the ~~Sibillian~~ <sup>Sivillian</sup> of course, is the fact that these triangular

and trapezoidal flakes which are common thru out and the fact that the bulb is almost

always removed and this curious U shaped ~~curving~~ truncation. This is a Borda fact,

not an artifact. He made it last summer for me. You can tell. <sup>how he makes it,</sup>

<sup>Bordes</sup> Oh, well, that's not difficult at all. You take a flake, a Levallois flake

if you have one in your hand, if not a flake which is not special like Levallois

you make a truncation to give a shape, and then you put it on a stone and you make

a second truncation taking off the burin, and that's very easy to do, you know?

Le. 25.3.74

Phil Smith

Here's a kind core which is Levallois core which is found quite often in the

Middle ~~Sibillian~~ <sup>Sevillian</sup> and even in the Late and this core is more like those found in the

Early Sibillian. In the Early ~~Sibillian~~ <sup>Sevillian</sup> most of the artifacts are done in basalt and

~~discrete~~ <sup>discrete</sup> ~~straight~~, as Venoir observed. In the Middle and Late they <sup>tend to</sup> swing more and more to flint.

Bordes This is a <sup>discoidal</sup> core.  
~~not a Levallois core~~

....

Phil Smith

No, it's not a levallois core, but you find those in the Early to Middle.

Towards the end there are quite a number of back bladlets present : triagneles,

trapezes, scalenes, virturally every geometric form that one can ~~think~~ <sup>think</sup> of. And in

one very late ~~Sibillian~~ <sup>Sevillian</sup> site I found these three artifacts which Venoir hadn't

reported. They seemed to be in place, and they are really slugs, ~~Remas~~, with what

might be, it's hard to say, I think it's percussion/ retouch.

Bordes

<sup>Oh, ya, ya, ya</sup>  
Micro ~~flakes~~ flakes. You know, what there is. It this a break, oh no, if this is

not a break of the tool after ~~completion~~ <sup>completion</sup> it is not struck. For typologically to

be a <sup>true</sup> slug, you have to have retouch all around. This one would be better, not the

~~sh~~ shape, and this, what is the matter with this?

Phil Smith

That's a small <sup>version</sup>

Tipier

So called....

Phil Smith

Double concave scaper rather <sup>spoke-shaped</sup> Very large number of these. Not

this one, but quite a lot of these ~~Sibillian~~ <sup>Sevillian</sup> points. ~~They~~ They are not retouched

except that the bulb <sup>they are left.</sup> I don't see one at the moment. <sup>is</sup> This comes close to be it. They

ce-25.3.7.5

are left in their natural state, after being struck usually from the ~~Levallois~~ cores.

Erwin: Phil, do you get a lot of micro burins with this?

Phil Smith: Quite a few yes, They tend to be heavier, than *those*.

Erwin: Little ones, Do you get little ones.

Phil Smith: No, they tend, no they are not <sup>as</sup> small because all the bladlets in the ~~Solutrean~~ <sup>Savallian</sup> are rather thick. You don't get any very small micro burins such as this. This

is more typical although it comes from a different industry. This is more typical. *of the Savallian type.*

Erwin: But you don't get any of these little ones? *Less* Retouch.

Phil Smith: No. They ~~didn't~~ <sup>didn't</sup> have a very delicate bladlet technique.

Erwin: You got a little blade.

Phil Smith: Yes, you do but they....

Erwin: They ~~didn't~~ <sup>didn't</sup> do it by a micro-burin technique.

Phil Smith: Apparently they didn't. I found no very tiny micro burins.

Tipier: *Proximal ones or distal ones*

Phil Smith: Both.

Bordes: Well we <sup>have two tables</sup> are still ~~top~~ <sup>to examine</sup> ~~devils~~, at least ~~to examine~~ in ~~very short and~~ <sup>a</sup> very short day

*& very short* time so it could be, could be, could be.

Phil Smith: O. K. well.

Bordes: Which gives the name <sup>of the</sup> site of the ~~Solutrean~~ <sup>Solutrean</sup> but not <sup>the</sup> type site. You have this

white <sup>flint</sup> ~~flint~~ from .... And then you have here some casts of some very good

60-25-3-7-4

points, which are probably the most magnificent Silutrean every made by man. These are two <sup>American</sup> tools coming from a collection which is very, very rich in beautiful tools

with what a pity more emphasis on the price than the rest

than from the origin from <sup>which this is Illinois</sup> which is rather big. And this

one is Kentucky. And here you have tools and things that is from <sup>Solutrean</sup> ~~Silutrean~~.

This is a very very <sup>Solutrean</sup> which comes from upper Paleolithic.

And that it what could pass for a Silutrean ....

but it is much later since it comes from a <sup>chaleolithic level.</sup> ~~calcalith level~~. You can see

here many definitions <sup>of casts</sup> ~~of casts~~ and the <sup>tools</sup> ~~are~~ are much more magnificent than that <sup>also.</sup>

and which are very, very long, rather wide and very, very thin, and they seem <sup>however</sup> mainly to

have been made by percussion. Either indirect percussion or <sup>only</sup> percussion

by <sup>somebody who really did know</sup> ~~some other way who knows his business~~. I can't tell and I would like Mr.

Crabtree to comment <sup>on</sup> this. That was a <sup>cast</sup> ~~flash~~, and <sup>there</sup> ~~that was~~ were about 18 or 20

pieces like that. All magnificent.

Crabtree:

There are many mechanical problems involved in <sup>doing this type of work.</sup> ~~this sort of thing~~. You'll

notice the size of the <sup>detached flakes</sup> ~~pieces in this~~ - the amount <sup>of stone removed in</sup> ~~of area strictly a mechanical~~ relation to the edge - <sup>strictly a mechanical & physical problem.</sup> ~~standpoint area of stone in relation to the edge.~~

<sup>very critical it must be at,</sup> ~~must be~~ right angled <sup>to the artifact</sup> ~~near~~. It must not ~~vary hardly~~ <sup>is being removed, it is hard</sup> a degree, otherwise it will ~~snip~~ <sup>break</sup>

<sup>the artifact</sup> ~~the thing thru~~. Yet ~~again~~ when ~~you are~~ <sup>because of</sup> ~~tapping~~ <sup>to</sup> this much area, <sup>there is</sup> to prevent the edge

from crushing ~~and~~ the shock ~~from~~ the ends, <sup>Because if,</sup> the slightest tap on the

end ~~of this right line~~ ~~is done~~ the other end flies off as a hinge <sup>trick</sup> ~~but the~~

Le. 25.3.7.7

must be ~~somehow dampen~~ <sup>to somehow dampen</sup> the shock ~~of this~~ and apparently to use some sort of ~~this~~  
~~will call it this time, we'll change another term but perhaps some sort of~~ a bipolar

technique to get this ~~end~~ feather <sup>in</sup> out. However, some <sup>flakes</sup> do appear to have ~~been~~ met  
 on the opposite side as a thinning technique <sup>and</sup> apparently <sup>were made</sup> ~~from~~ a very large blade or <sup>with</sup>

the core <sup>technique</sup> ~~in manufacturing these~~, but the placement and the regularity of the flakes <sup>are</sup>  
~~removed to design these in between each~~ <sup>if the flakes on the opposite side</sup> ~~and~~ they are almost full flakes

without a great deal of over lapping . They haven't used the next ridge ~~to~~  
 to guide their flakes, but have <sup>used the flat surface and regularity</sup> ~~utilized this space~~ ahead <sup>of them</sup> each time ~~with~~ so ~~fast~~

<sup>Therefore the flakes are conchoidal rather than</sup>  
~~flakes have a curve rather than a parallel~~ sort of ~~technique~~. There may

have been <sup>a</sup> slight amount of pressure retouching done on <sup>the marginal edge</sup> ~~the ends or here or just~~

~~the tips~~, however, if you'll notice ~~in this~~ they didn't take off these

projections <sup>left from previous flake removal</sup> but ~~they~~ utilized <sup>this</sup> ~~the straight~~ material to ~~take~~ <sup>remove</sup>  
~~the flakes on the~~ <sup>opposite side</sup> ~~opposite sides~~ so they wouldn't pull out a <sup>portion with</sup> ~~big~~ half-moon <sup>the bulk of force</sup>

~~straight~~ <sup>resorted to</sup> ~~it wouldn't drive this off~~. But they have ~~utilized~~ every ~~sort of~~  
<sup>possible mechanical law</sup> ~~mechanical possibility~~ that you can think of in order to produce <sup>artifact</sup> a tool such as this.

They are <sup>truly</sup> magnificent pieces of workmanship. ~~and~~ there appears to be a uniformity

<sup>of</sup> manufacture ~~of these or have~~ of straightness and <sup>regularity</sup> ~~regularness~~ <sup>artifacts</sup> these blades that  
<sup>would suggest the use of indirect percussion</sup>

They most certainly have been ceremonial ~~to~~ objects. But for slicing elephants, you  
 could take a <sup>awfully</sup> ~~big~~ big slice.

Bordes Well, this is many levels of the <sup>Solutrean</sup> ~~.....~~ Where the thing was not too good  
 on the edge. And so it is not as beautiful as in other Solutrean sites, but it is

Co. 25.3.7.8



interesting to see the wide range <sup>of</sup> ~~in~~ variation between the most elaborate ones which are sometimes not bad at all, like this one for instance, and this one, and some things which can be , how you call it, preforms. Could also be heavy tools

This I wonder if it was ever intended to make a Silutrean ~~lower leaf~~ <sup>Laurel leaf</sup>. I don't

think so. There are also, you know, that there are a kind of small hand axes in the Silutrean and this is probably one of these small hand axes and not at all a

preparation for a ~~lower leaf~~ <sup>Laurel Leaf</sup>. We have also the same problem that you have got

in the States. Here is ~~a~~ an interesting one, which will also remind you of thing

we ~~are seeing~~ <sup>have seen</sup>, a piece on which it give a burin blow. ~~The question is~~, There is

another one here . <sup>The question is</sup> Is this really to make a burin or is it to make a kind of stem?

That's another question. This one, no question, it is certainly a burin blow. We

have a lot of burins made on broken ~~lower leaves~~ <sup>Laurel Leaves</sup>. I have seen another one; I don't

know where. And that is a point which is different. In that case, in that case,

it could be a burin blow, but it could be also something a shock. And that will be

interesting because it will show that relatively big things could be projectile ~~by~~

points, not only knives, as some people have said. That's a thing that had happened

to them, you know, flaking it and they took too much <sup>of a</sup> bite in the flint and ~~long~~ <sup>long</sup>,

it ~~broken~~ <sup>broke</sup> on the side. And there were some here which are interesting with a stem

some not very well.

Ce. 25. 3. 7. 9

*Cambien* Question in French.

*Boudes*: No, no, no. ~~That is certainly Silutrean~~. In Perigeau - well, These are some in ~~lower~~ <sup>Laurel Leaf etc.</sup>

And, also, one of the characteristics of ~~Solutrean~~ <sup>Solutrean</sup> of this site is that very often they made things which were just worked a little bit and left a big unifacial

This one with ~~an~~ <sup>the exception of, the</sup> exceptional stem; it's not even unifacial. Just a little one almost.

Ah, here, that's interesting. What do you think of this one, Crabtree? Do you think that is pressure work here?

Crabtree: <sup>There are</sup> Two indications of pressure work here. This one ~~is~~ appears to be <sup>a</sup> pressure work ~~of that~~ and yet the normal ~~Solutrean~~ <sup>Solutrean has a</sup> ~~is this fairly deep square,~~ <sup>termination of the flake and</sup> and the same

~~a series of these flakes are removed.~~ <sup>the principle</sup> technique is carried on through. I mean, ~~the principle~~ of working flint ~~is~~ <sup>in</sup>

~~Solutrean~~ <sup>is</sup> blades of spacing ~~these~~ each, <sup>flake so they are separate and away from each other,</sup> ~~one~~ where they get away from the others. It

is most certainly this sort of thing <sup>wide</sup> ~~is this sort of~~ flake ~~on here,~~ <sup>and the</sup> this narrowness, <sup>at the proximal end of the flake leaving both</sup> ~~leaving~~ the sharpness <sup>and</sup> of regularity, ~~that is~~ <sup>there is</sup> no doubt, pressure retouch ~~on~~

~~that,~~ <sup>the marginal edges shaving</sup> but quite a little refinement, ~~from many of them that we have seen for pressure~~

~~work.~~

Bordes: And here, they did not bother to take this off. They could. They could. That could have been done, just holding it a little here and oblique blow <sup>on there</sup>, the same technique to get <sup>rid of</sup> ~~a little~~ square edge. It could have been done by pressure, by percussion, but it did not seem to bother them enough, and so they kept it like that.

Cambier: Question in French.

Ah, yea. In the Upper ~~Solutrean~~ <sup>Solutrean</sup>, you have this very, this one is certainly pressure work I think, and made very often flat. One face is not retouch <sup>ed,</sup> almost ~~none.~~

And here this one it seems to be the preparation of <sup>a</sup> ~~the~~ platform for pressure flaking.

Co. 25.3.7.10

which is not very often seen in the Solutrean, this preparation.

*Crabtree* No, this is different from what *they did*,

*Bordes* It was removed or it was not done, you know. Here for instance, it does not seem, it seems that the bulb is there all right, and they did not seem to have prepared any platform for pressure on this one, you see.

*Crabtree* A sharpening. But he was ~~holding them~~ *holding the flakes* across which was not distinctive with the normal Solutrean. This is a little variation from ~~this that we see~~ *what we saw yesterday.* at the museum, ~~this one here of this particular technique is coming out.~~ *shaving up.* They are following the ridges ~~overlapping,~~ *overlapping,* double overlapping, following the ridges and are able to carry their flakes longer and up over the surface which shows a little change in technique between ~~many of these.~~ *the burins & this*

*Bordes* *ye, ye - between the burins & this*  
Yea, yea, ~~that's an~~ *end scraper* on it.

*Tipier* *Don*  
~~and~~ *Crabtree*, here there is a little polished edge. Do you think it is after or before flaking? Utilization or preparation.

*Crabtree* This appears to be utilization. As ~~the~~ *for projections,* ~~projects out~~ they are turned down the wrong way for a polish ~~to serve a~~ *to serve any purpose for flaking & seem* ~~utilization purpose.~~

*Tipier* ~~(In French)~~ *yes I think so.*

*Bordes* And this, this ~~catalytic~~ *chakolithic* tool. It is quite something different, you know?  
It's a blunt edge.

ce. 25. 3.7. 11

Discussion in French.

*Crabtree Phil's* Shows a slight amount of platform preparation on this edge ~~in~~ taking these flakes along ~~the~~ here, very regularly spaced, very nicely done. He couldn't have ~~carried~~ them any further because he had an indentation in the original flake, ~~which is~~ <sup>it is</sup> also interesting to see the straightening of the flake ~~by~~ by removing the two curved ends, ~~and that~~ <sup>partially</sup> one. A little different style.

*Bordes* Yea, much later.  
*Dougherty:* Is that Solutrean?  
*Crabtree* I can't tell from that. I just am not familiar enough with these stones .

There seems a slight difference but I am not sure.

*Bordes* Yea, it looks. Perhaps.  
*Phil Smith* One of the things which might account for the ~~wealth and the~~ <sup>relative scarcity of</sup> finely retouched piece of Solutrean is, <sup>the fact that it is</sup> ~~that it is~~ just about the only <sup>important</sup> open air Solutrean site known, and very <sup>possibly it was</sup> ~~likely~~ a seasonal encampment rather than a place where they lived for longer periods. This might account for lesser interest.

*Bordes* Ah, yea. You could say. Look, that's a <sup>Laurel Leaf</sup> ~~lower leaf~~ and here, <sup>probably on that</sup> ~~the~~ side, I don't know if it has been done, ~~oh~~ <sup>from</sup> no, it's done ~~on~~ this platform, you know. The leaving of the ridge here . It's not exactly <sup>fluting</sup> ~~fluting~~. Very close to it.

*Crabtree* Some fluting technique.  
*Bordes:* Very close to it. ~~Some~~ With this preparation of platform, no question. If it was smack in the middle.

Ca. 25.3.7.12

*so it was right*  
Craibtree ~~Right~~ in the middle. There we would have it.

Bordes: That's very interesting. Oh, no, no. That's much better. because what poor ~~Craibtree~~ <sup>man</sup> called fluting is just , ah, I have no blade here.

(In French)

Bordes Ya, ya, This one is a <sup>damn</sup> good one you know. <sup>with</sup> Preparation.

Tipier Do you think it is intentional?

Craibtree Excuse me, ~~there was just one thing.~~ <sup>one other thing.</sup> <sup>you are wondering how</sup> <sup>to remove</sup> ~~In wondering how we got~~ the long flakes, and

~~why~~ this has occurred ~~at~~ here.. Once this, <sup>like had</sup> ~~one was~~ stepped off, there was ~~no~~ way

to get any further. <sup>So he</sup> ~~it~~ followed all the way thru till ~~he~~ <sup>he</sup> hit this ridge, which would guide his flake, <sup>showing the flake coming</sup> clear across, then he could go all the way across the top of

<sup>the artifact</sup> ~~this like this.~~ But it is just a matter of <sup>mechanics</sup>

Bordes <sup>ya, ya.</sup> ~~And~~ probably there was, <sup>also</sup> a slight changing <sup>of</sup> angles. The angles was much like that and not so flat.

Craibtree He had a little ridge <sup>to guide the flake</sup> ~~the flake~~ guided right over the surface.

Bordes Yea, yea, yea.

Craibtree <sup>He</sup> Could keep going with long flakes.

Bordes This one is interesting you know, no ~~question~~, they prepared <sup>the</sup> ~~this~~ platform <sup>and</sup> ~~when~~ they took this ~~one~~ off.

Craibtree Right.

(In French)

Co. 25.3.7.13

Bordes: This kind of fluting I very often do, to get rid of the ridge.

Tipier I think it is a broken <sup>Laurel leaf</sup> ~~lower leaf~~.

Bordes What?

Tipier It's a broken <sup>Laurel leaf</sup> ~~lower leaf~~, I think.

Bordes No, no. I think it's a .

Tipier Is it not broken?

Bordes Yea,

Tipier Before flaking?

Bordes I think it is a ... they made this with a <sup>broken</sup> ~~broken~~ flake as I take very often <sup>when</sup> began to make a <sup>Laurel leaf work</sup> ~~lower leaf~~. ~~Used~~ this. I don't think it's a broken piece. No.

I don't. No, no, no. no.

Discussion in French.

Epstein: May I ask a question of Mr. Crabtree? As I understand your description of the <sup>flaking</sup> ~~flaking~~ technique done on these large <sup>Laurel leaves,</sup> ~~lower leaves~~, you point out that they did not utilize the other adjoining flake but went on ~~by~~ beyond it. Or in other <sup>words</sup> ~~words~~ they did not use the flake scar here but went <sup>much</sup> farther.

Crabtree Very true.

Epstein Now I don't know whether I understand you correctly or not, is there an advantage to this, as you see it?

Crabtree: Yes, <sup>to attain</sup> this extreme thinness <sup>one must space the flakes so that</sup> if you will ~~not~~ space it here, you are leaving material <sup>when</sup> ~~is left between them~~ you can ~~utilize~~ <sup>utilize</sup> this material ~~each time~~ some strength in between here, but you would utilize this greater amount of ~~strength to provide strength to~~ strength to ~~detach the~~ <sup>opposite side</sup> flake from the ~~outside end~~ <sup>Therefore,</sup> you will have a material in this area <sup>you a platform</sup> ~~Then~~ when detaching the little ~~of this thru this area then they would meet them~~ <sup>flakes, they will</sup> in the ~~center~~ center to thin down the artifact ~~this~~ down. A type of thinning flake.

Epstein: Then in other words, it's the nature of the material which almost demands

a technique of this kind or something related to it. Is this correct?

Crabtree: Well, it is just a matter of stresses and strains <sup>in the material</sup>. You ~~must~~ <sup>you must retain enough material</sup> retain enough material as you are moving ahead, ~~in order~~ <sup>to</sup> withstand this amount of shock on the edge. So by spacing <sup>the flakes</sup> this further ahead ~~to~~ <sup>over</sup> provide a platform and then the ~~thickness~~ <sup>the opposite side</sup> it would be all right to do one flat side ~~but to~~ <sup>to get the</sup> thin this side, you ~~must~~ <sup>you must retain enough material</sup> still retain enough material. ~~By utilizing just this much of it~~ <sup>By leaving this amount of material,</sup> assists ~~sufficiently~~ <sup>the flakes are</sup> to take off flakes on the far side, ~~as you see~~ <sup>as you see</sup> these staggered. ~~from one place here, on here,~~ <sup>the flakes in this manner, one gains</sup> So by spacing this across here like this, gives them a little additional strength in order to detach the flake on the opposite side.

Epstein: Mr. Crabtree, then do you see in some of the very thin bifaces of Hopewell.

Do you see the same technique? I don't remember from when we discussed it the last time.

*There appears to be a similarity in the technique, however, even with this there is a certain amount of this that hasn't been incorporated.*

Crabtree: They didn't <sup>get</sup> as thin ~~a~~ <sup>an artifact</sup> blade. However, between these two points, had he ~~not~~ <sup>not</sup> trimmed off the material, ~~without thinning this off,~~ <sup>possibly have</sup> he could ~~have~~ <sup>removed</sup> a very heavy, big ~~blade~~ <sup>flake</sup> by

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using the to ~~utilizing edge strength and this provides greater edge strength to~~ withstand the shock.

Epstein But these, of course, are not quite as thin as these

Crabtree No, this <sup>type of thinning</sup> ~~sort of thing~~ hasn't the regularity. These flakes are <sup>fairly</sup> ~~fairly~~ regular

on this side, but he hasn't <sup>taken advantage of the material</sup> ~~utilized that sort of thing~~ in between. ~~Slightly~~ on

this ~~one here and on this one~~ here he has <sup>used it to</sup> ~~done it~~ to a degree, but not <sup>to the degree</sup> ~~with the~~

of uniformity of these Solutrean tools.

Epstein If you were doing something like this, would you prefer, since this <sup>Technique</sup> ~~Technique~~ of staggering flakes demands a fair amount of precision, would you prefer to do this <sup>with percussion?</sup> ~~with percussion?~~

~~Don't mention it.~~

Would you prefer to do this ~~with percussion?~~

Crabtree Oh, yes. <sup>so think percussion is the only method for removing large flakes.</sup> ~~I think that this is the only thing,~~ But ~~the thing~~ of it is strictly a

problem of <sup>of flintworking,</sup> mechanics, ~~where,~~ Gerry, ~~that~~ I feel there must be some sort of ~~support~~ <sup>for the</sup> artifact to remove these large flakes and it would also utilize some of this edge in order to ~~also~~ <sup>the</sup> confine your shock to a restricted area.

this point. If it is held ~~loosely~~ <sup>loosely</sup>, ~~these~~ <sup>the</sup> ends are going to fly off and you

will lose <sup>the artifact.</sup> ~~your blade.~~ But you must have this either covered with clay, as Dr. Bordes

mentioned ~~some place,~~ <sup>to dampen the shock or</sup> you may ~~remove~~ <sup>small flakes</sup> as you go along <sup>the edge.</sup> ~~or something~~ <sup>when it is unsupported, the shock is dissipated into the artifact</sup>

~~Because~~ <sup>Because</sup> the quivering and the shaking, you can feel in your hands, ~~and when you~~ <sup>creating stresses,</sup> which will fracture the artifact. ~~strike a small piece you feel that carry thru with a big block there is no shock.~~

~~And~~ <sup>And</sup> when you ~~get lightness such as this,~~ <sup>thin down to this degree the</sup> shock is terrific.

Bordes Yes, but you have to be very careful to work on something not too hard.

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Probably 4 or 5 layers of <sup>leather</sup> ~~feathers~~ or something like that.

*Crabtree* Some wood perhaps.

*Bordes* Some wood, better than wood, ~~stone~~ ....

*Epstein* Suppose one were to just dig a hole in the ground and put a rock underneath say a couple of inches, 3 inches in the ground and then just put dirt or sand <sup>in</sup> and cover that and then place his biface edgewise <sup>into</sup> to the ~~dirt~~ <sup>dirt</sup>. Could that accomplish that effect?

*Bordes* I don't know.

*Crabtree* I don't know, Gerry.

*Bordes* I don't know, but I don't think so.

*Crabtree*: I don't think sand would offer sufficient support <sup>and</sup> ~~that you will still~~ as you ~~strike~~ <sup>would still get</sup> outward you ~~will~~ <sup>get</sup> flexing, even in sand. You need to <sup>use</sup> ~~have this~~ sort of a bipolar ~~thing that you are not going to have a bipolar flake~~ <sup>Technique but not get</sup> ~~that you~~ you must just miss opposing forces <sup>similar to the Cahokia fluting</sup> in order for the flake to terminate ~~going to miss~~ ~~with this sort of~~ ~~thing with~~ ~~are~~ in order to get <sup>the flakes</sup> ~~to~~ feather out and <sup>not</sup> keep control and confine <sup>the force</sup> it in one small area. ~~Your~~ ~~force~~ <sup>the flakes</sup> ~~on this~~. Because ~~they~~ do radiate out and would most certainly cause a break.

Co. 25.3.7.17

Phil Smith (Real 15)

Real #15

Wadi Halfa

Do you find something like this around ~~Wadi Halfa~~, Henry?

Ce. 25.3.7.18

Damon

This industry is very curious, we have an industry, oh we have two industries

which have these little pieces that have these arched back like this, but as far

as I know, at least with the stuff that I worked with, we lacked micro burin technique.

some which are perhaps,

Except ~~perhaps in~~ very rare, you know, one tenth of one percent. With that industry

over there, we get two forms of that industry and one form has little lamella ~~as~~ don