A Different Method for Forging Sword "Fullers"

Over the past few years, I've occasionally puzzled about the fullers in Viking era swords. Modern smiths recreating these swords either grind them, or forge them in with spring fullers, neither of which methods fits with what we know about the Viking toolkit.

Recently, through dumb luck and serendipity, I came up with an idea that the fuller shape could be created by upsetting the edges of the core bar before the steel edged are welded on. That is, starting with a bar that represents the thinnest part of the blade profile, rather than working back from the thickest one.

I found this idea attractive because it would require only a hammer and anvil(plus of course, some practice and skill). It could explain why the edges of the "fuller" are usually so nicely concurrent with the edge of the core bar. And it would explain how the form arose, as an artifact of the construction method of steel edges on a pattern welded core, that was more and more accentuated over time, from the flat cores of the Anglo-Saxon era to the shallow fullers of earlier Viking era swords. As the form was defined, it's advantages of lightness and stiffness would be recognized, and retained and exaggerated. As the construction methods of the blade changed from pattern-welded to all steel blades, this would suggest why the fullers tended to get narrower and deeper over time.

So first I'll explain the method, and then I'll come back to point out a few things in favor of this hypothesis.

Trial #1 Here's the first somewhat successful attempt at doing this. The early trials that didn't work failed from improper choice of starting sizes. This case is a small dagger sized version of the basis sword shape.(Both the following example are simply forged from mild steel, disregarding for now the nuances I'm sure will arise from using a pattern-welded core and steel edges.)

Starting with a core bar of 3/16" by 1 ½", the point is forged, and then the edges are upset using a small hammer and light snappy blows:

(photo following page)

The edge bars of 5/16" square are tacked on (with an arc welder for convenience and clarity).

Then the bars are welded on (Ithink this is showing halfway through the second of two passes of welding):

And here the bevels are beginning to be defined:

(photo next page)

Then the rough shape is forged. This could have been further defined by hammer, but I deemed it good enough for the moment.

Trial # 2 With this successful experiment in hand I tried again, trying to choose sizes that would end up close to real Viking sword dimensions. Here I used a core bar of 3/16" x 2", with 3/8" square bares for the edge:

And here's the result, after spending ten minutes with a file on the edges and rubbing the "fuller"with a crumbly piece of sandstone: (next page)

So here's a few advantages of doing it this way, and arguments in favor of this hypothesis as a historical method:

1) I think this is actually a rather quick, easy, and accurate way to create this form. It's all done by one man, with small hammers, with small bars, and short welding heats in a solid fuel fire. The second example above took me 85 minutes, and it's only my second attempt.

2) The design and proportions of the blade all derive from the shape and size of the core, and the size and cross-section of the edge bars. Like so many forging problems, if you get the setup shapes right, the final shape is almost automatic. The coincidence of the bevel with the core bar is now also automatic, without the struggle this would cause when grinding or hammering in a fuller.

3) With the core bar defining both the fuller and the overall outline, tapered blades and tapered fullers are now a much simpler proposition.

4) So many historical blades show a simple chevron pattern, which indicates very minimal stock removal in the fuller. This method allows that.

5) It would seem to be a much simpler thing to add inlays of lettering and symbols to the flat bar before upsetting and welding, rather than adding such a tricky little detail to a curved surface after you've already forged the whole blade!

I'm hoping some of you who are more knowledgeable and blade-obsessed than I am will pitch in to working out this idea. The only way we'll really know if this (or a variation of this) is how it was done is to make lots of them. Looking for characteristic pattern distortions in the core (or lack thereof), and other signatures that might arise, and then looking at the originals to compare. Already, as I've educated myself more on the historic examples, I have seen a few details of shape (rather than pattern) that encourage me, especially in the blade-to-tang transitions, and in the taper and termination of the fullers.

And to preach a few seconds- this can't be answered by the smiths or the academics alone- an answer will require honest work by both!