How to collect a micromorphology block from a profile with plaster bandages

In 48 images

*useful for very important samples, or sequences with abundant rocks, layers of differing density/hardness, or loose sediment

Photos of Susan Mentzer collecting a block from the site of Klasies River. Photos by Christopher Miller. Please email susan.mentzer@ifu.uni-tuebingen.de prior to redistribution, other than use in teaching.

Supplies needed

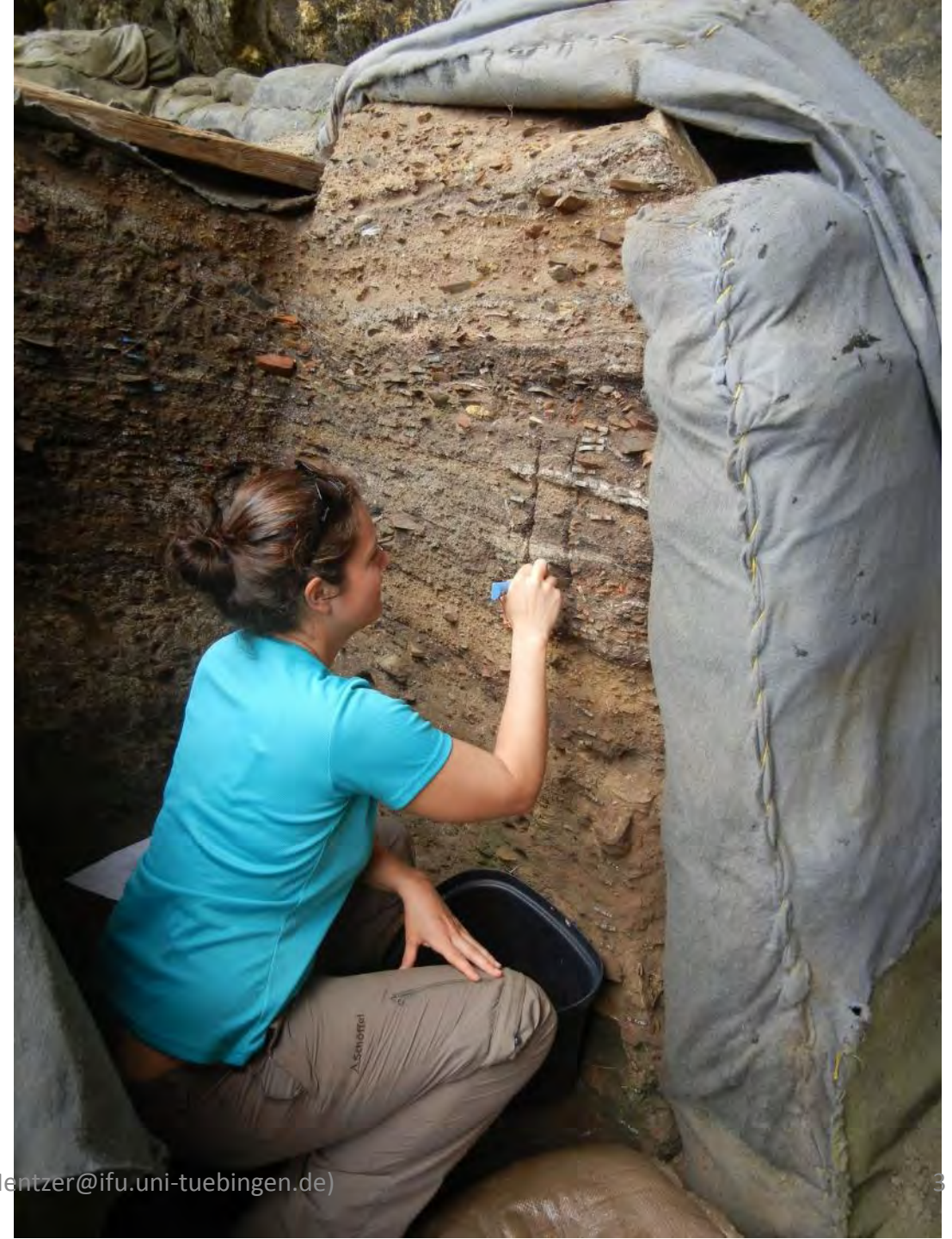
- Pocket knife, preferably two
- Hammer (maybe)
- Chisels (maybe)
- Plaster-coated bandages
- Scissors
- Container of water
- Camera
- Scale bar
- Field notebook
- Marker or nail polish

Sketch out the edges of your sample

Use a pocket knife with an 8-10 cm blade, like an Opinel

Make the initial cuts slightly wider and taller than the block that you would like to collect, on the order of 1-2 cm

This accounts for the sediment that will fall away as you cut



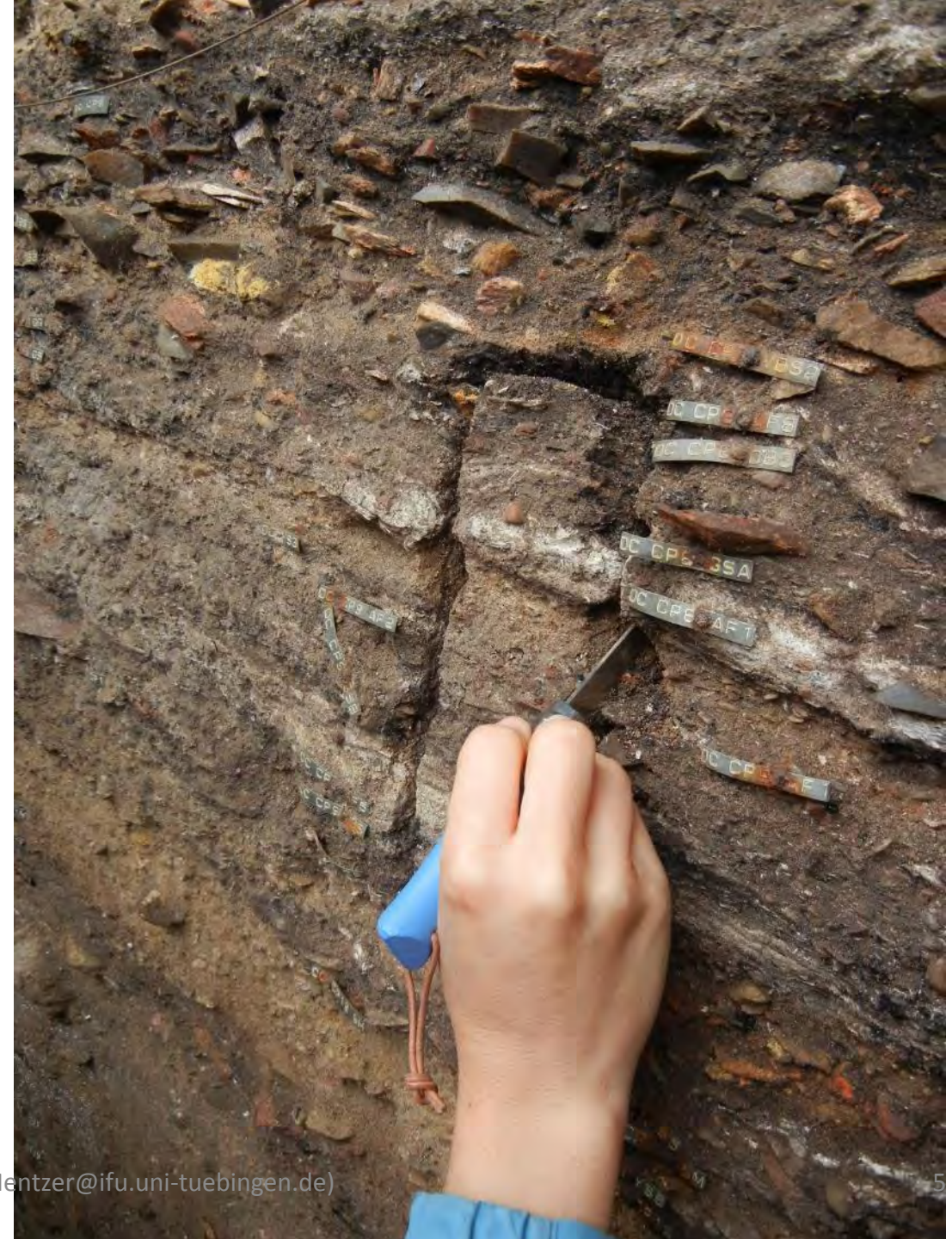
Cut deeper into the profile, using your initial box as a guide

Aim for at least 6 cm depth

If necessary, collect the falling sediment in a bucket for screening

Enlarge the cuts

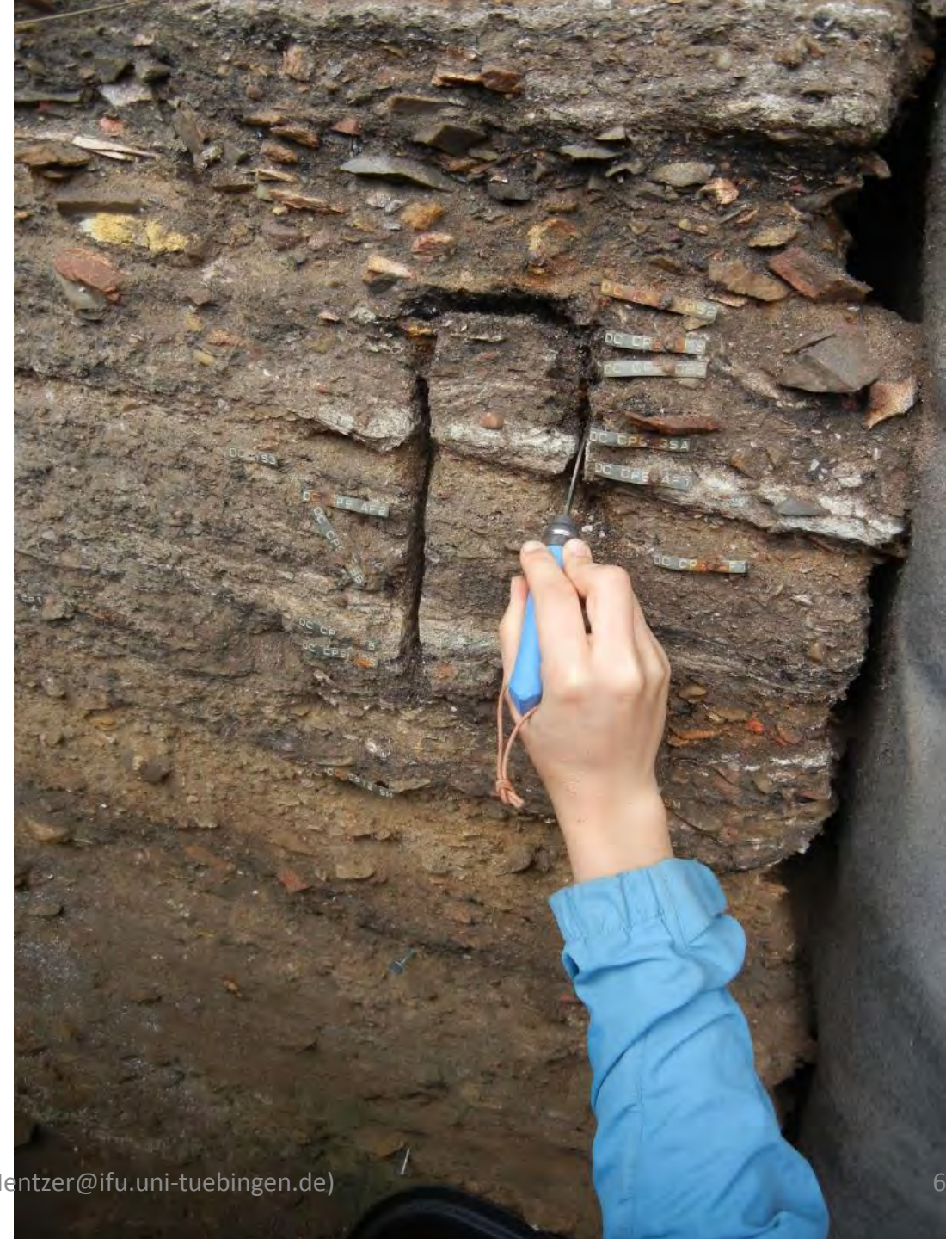
Don’t rush this step



Enlarge the cuts

Carefully chip away at the more cemented or harder areas.

If you encounter a bone, lithic, piece of pottery or rock, proceed carefully to avoid breaking your sample. It may be best to have an object sticking out the side rather than risk destroying the sample.



Cut the base of the block

Do this carefully

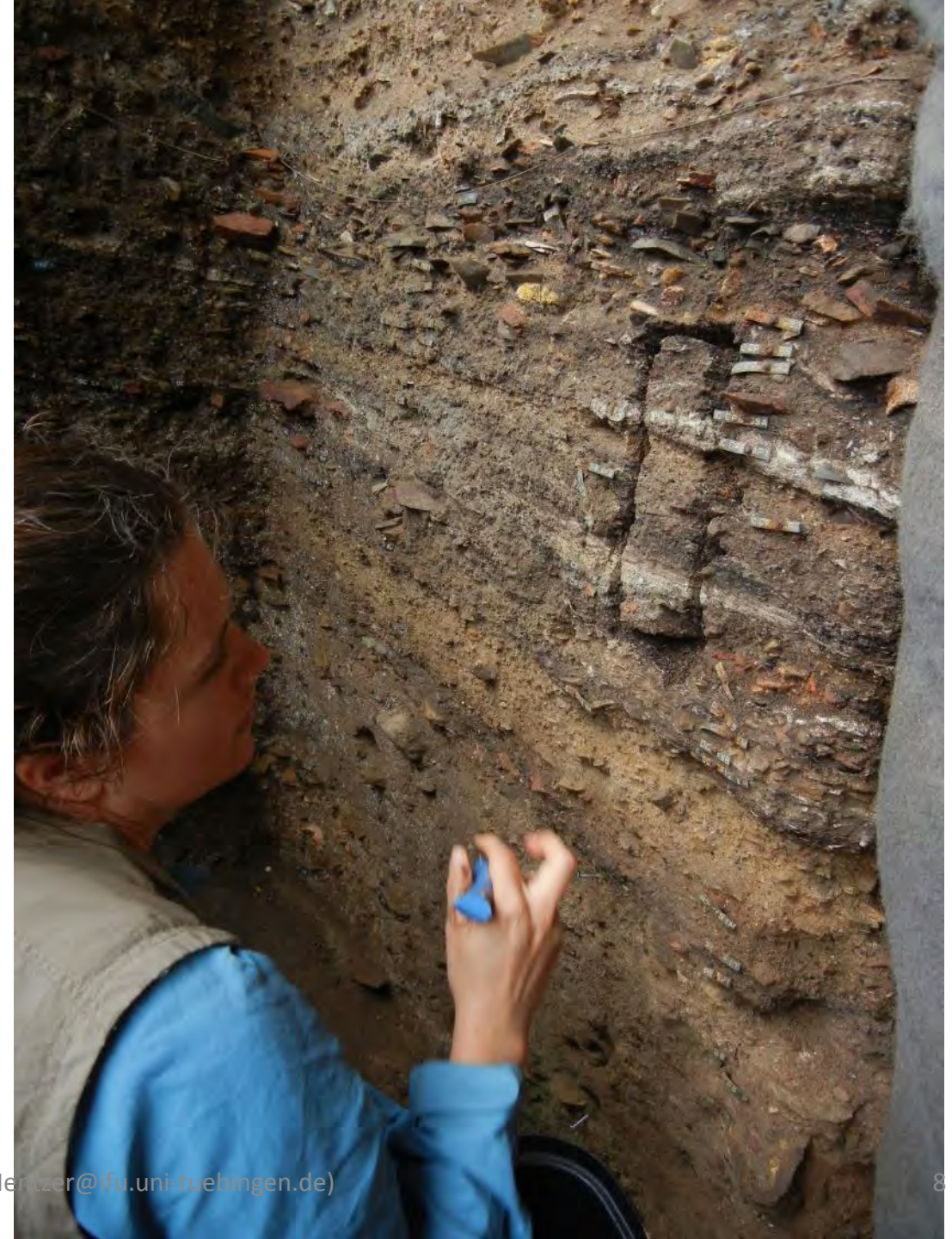
If your profile is fragile, you can wait to cut the base until after you plaster the block

If possible, make the base a harder layer so it will support the block, even if this means collecting a block that is slightly larger than you need. You can always specify in the notes that the basal layer is not important.

Check the dimensions

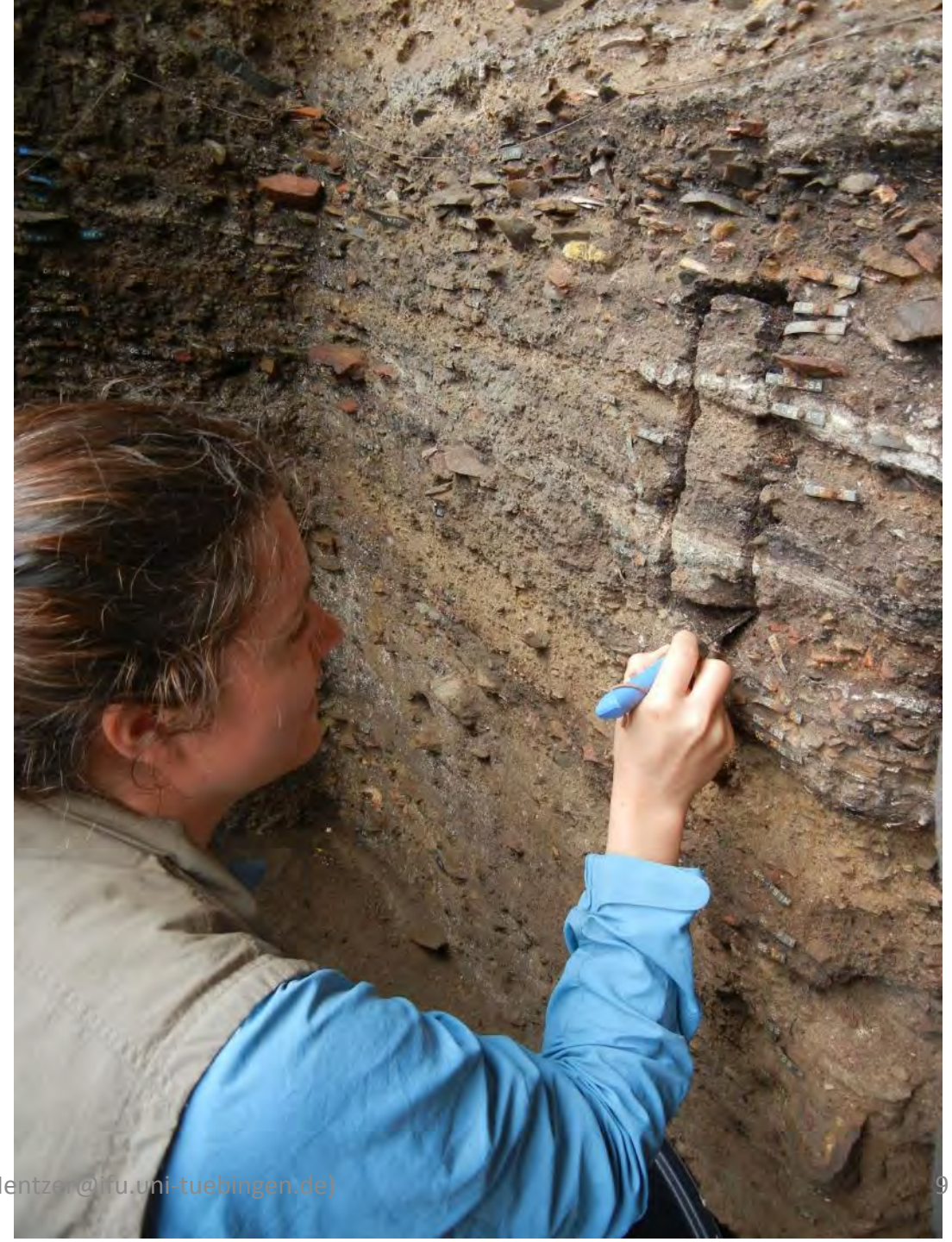
The edges should be at least 3 cm deep, but 5+ cm is better

If you anticipate having difficulty removing the block from the profile (e.g. if the sediment is heavily indurated), it can help to cut the edges at a slight angle, with the cut angling towards the back of the block so that the back face is narrower than the front face



Cut an angle at the base

Create a small workspace beneath your block

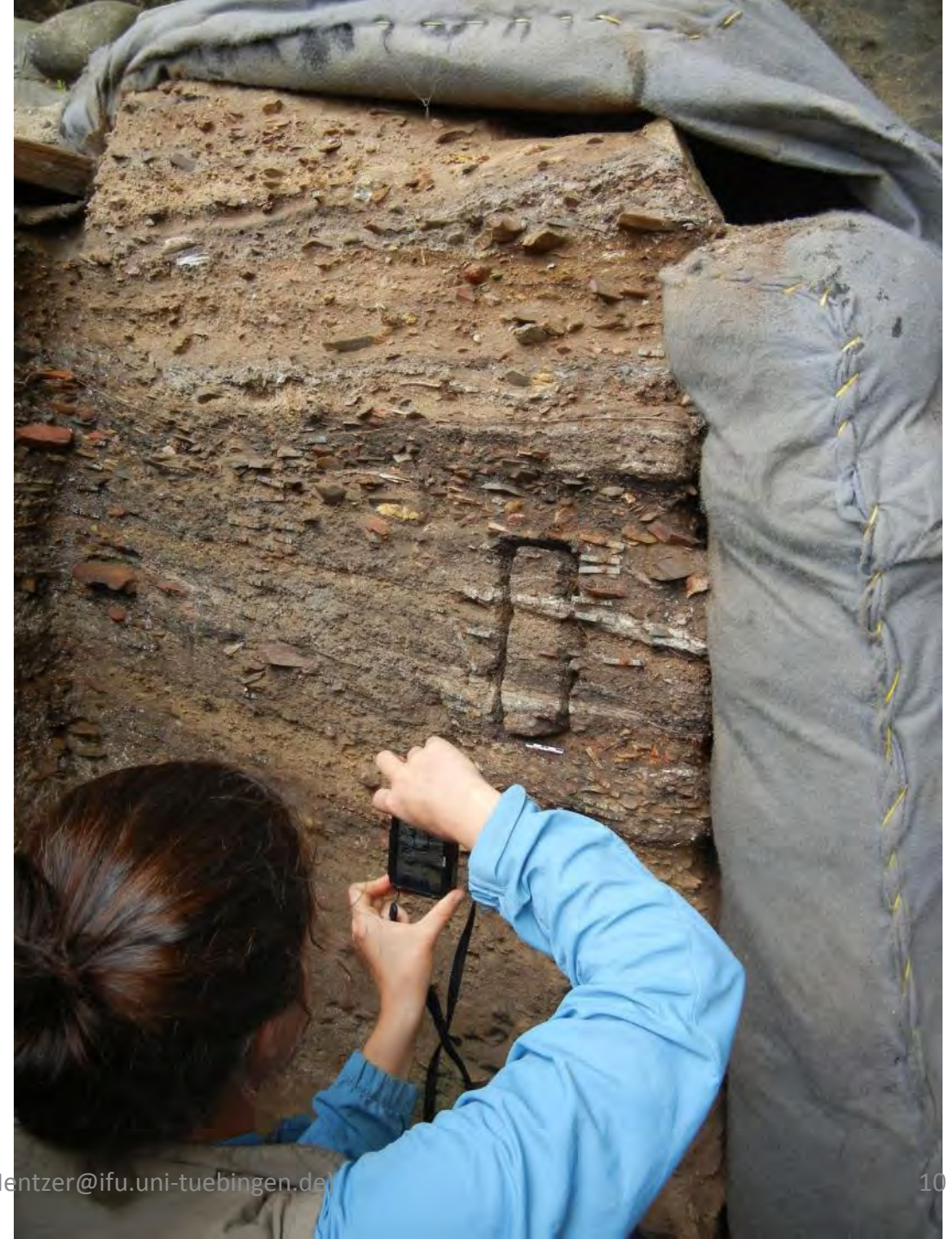


Take a photo of the sample in the profile

Don’t forget your scale bar

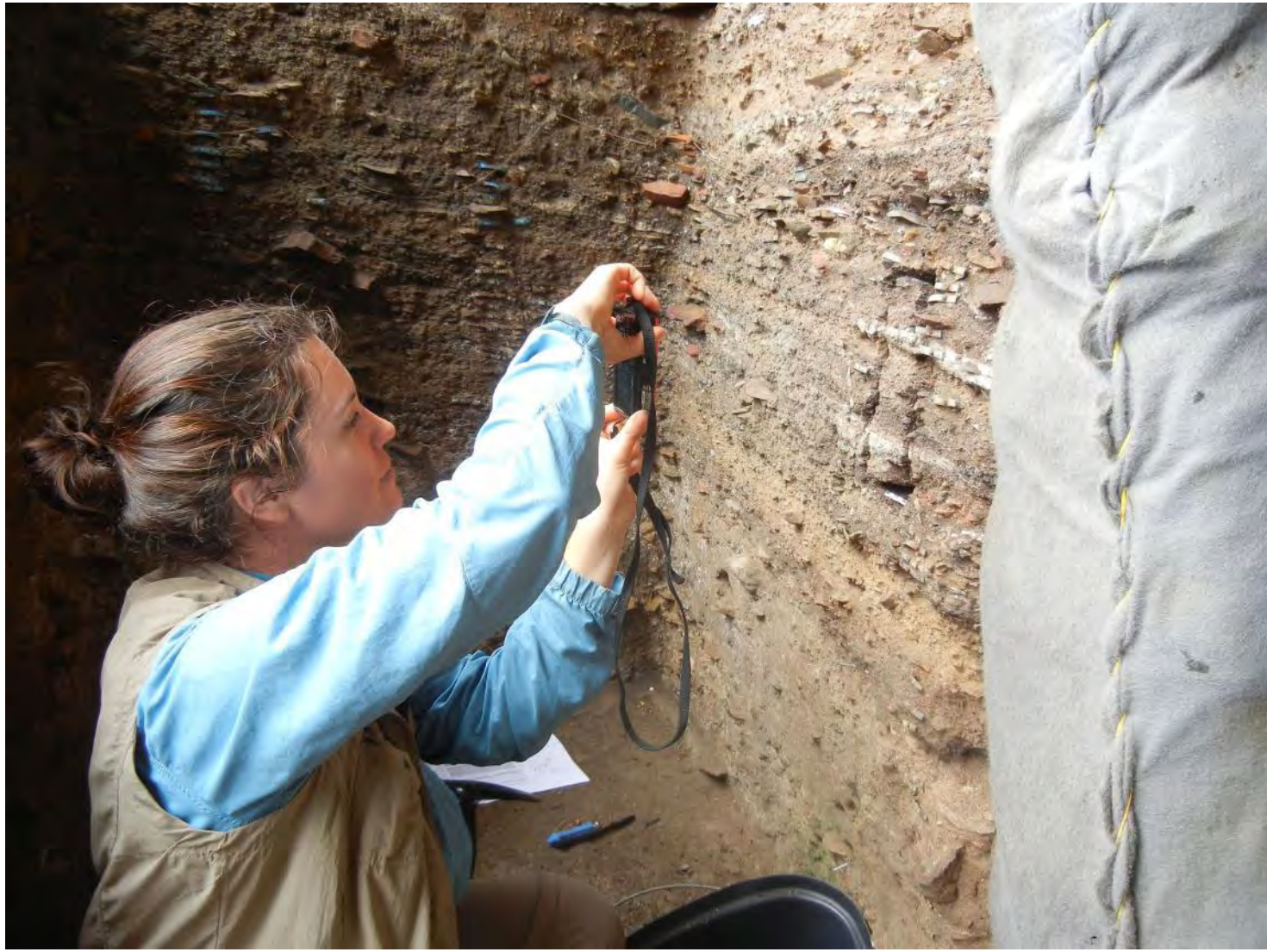
Make sure that any layer labels are readable

Clean the profile and block with a brush or air to remove all loose sediment



Try to keep the camera parallel to the profile face

Take several photos



Start applying your bandages

Buy plaster bandages at most European pharmacies or medical supply stores, or order on the internet

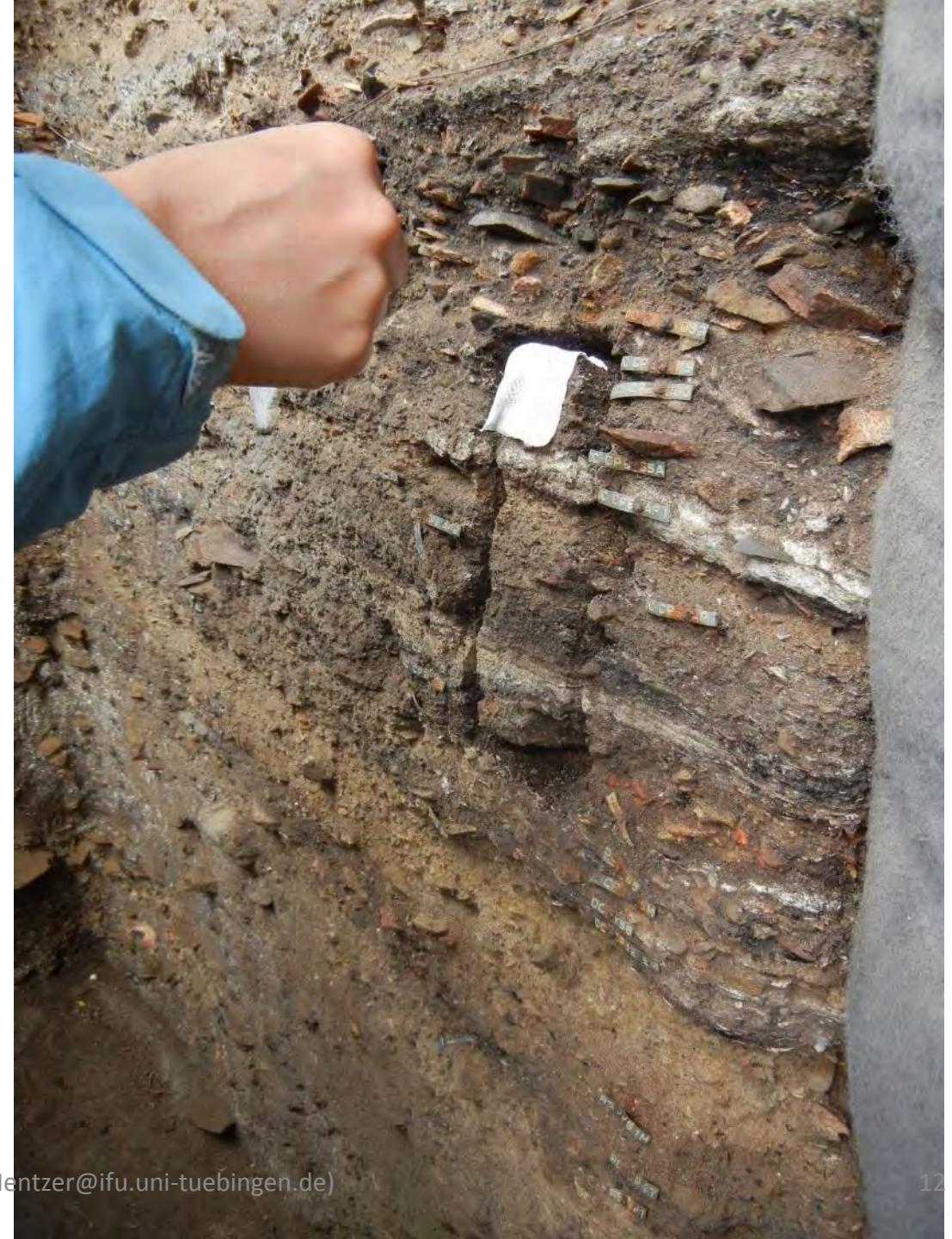
The plaster bandages should be cut into ~10 cm pieces

Have a stack of plaster bandage pieces all ready to go

When you are ready to use a piece, dip it into a container of water, and drag it along the side of the container to remove the excess water

Put your first bandages on the top of the sample

Fold the piece, and put the folded part on the top of the block to have an area of double thickness. Let the remainder hang down the front.



Add a few more pieces to the top

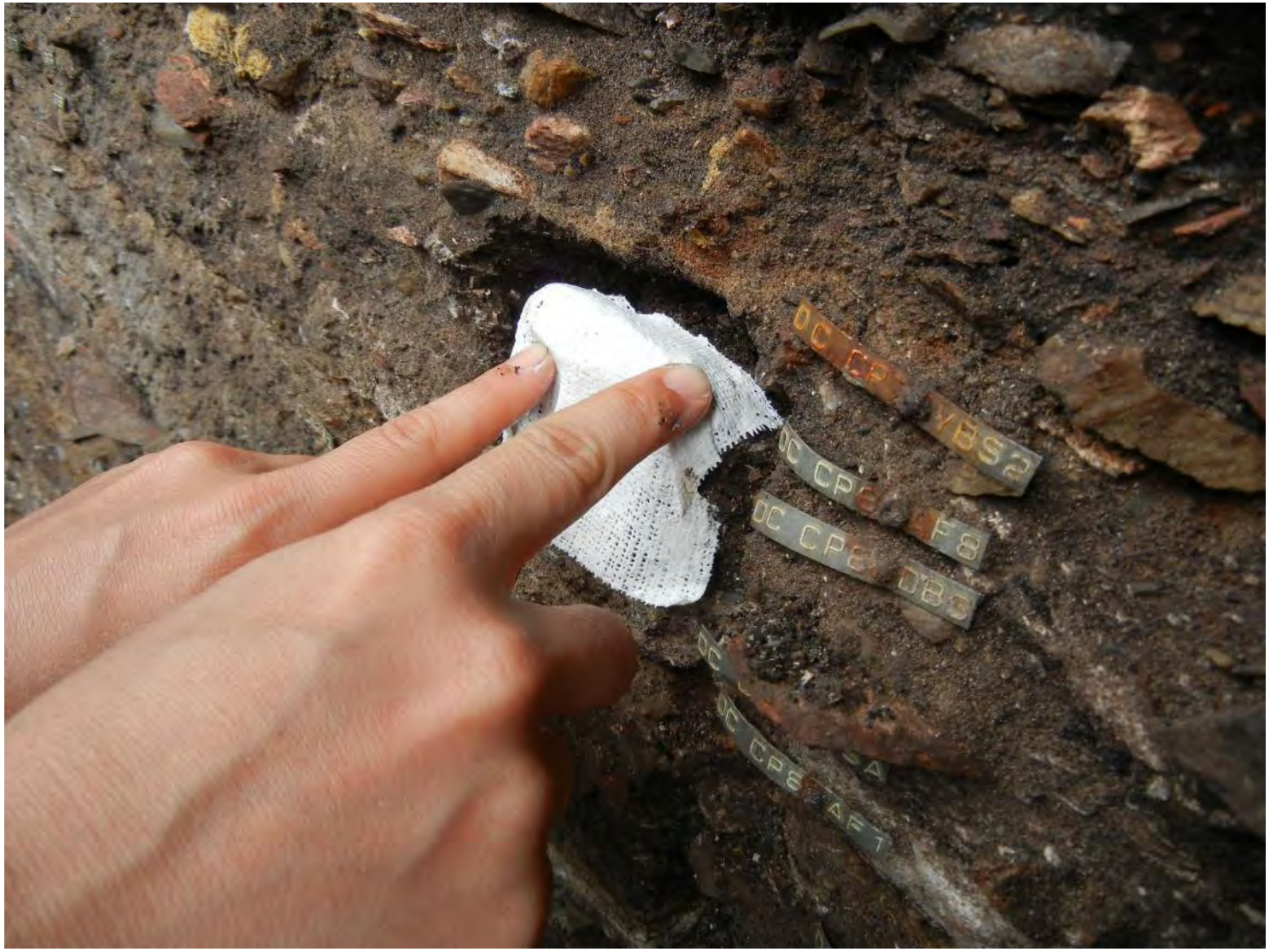
You should work rather quickly, as that plaster will harden within a few minutes

Gently press the plaster around the top of the sample

You want the plaster to mold to the shape of the block

Start with the top and corners

It helps to wet your fingers with water first



Mold the plaster to the front of the block

Add a few more pieces of plaster if necessary to have double or triple thickness

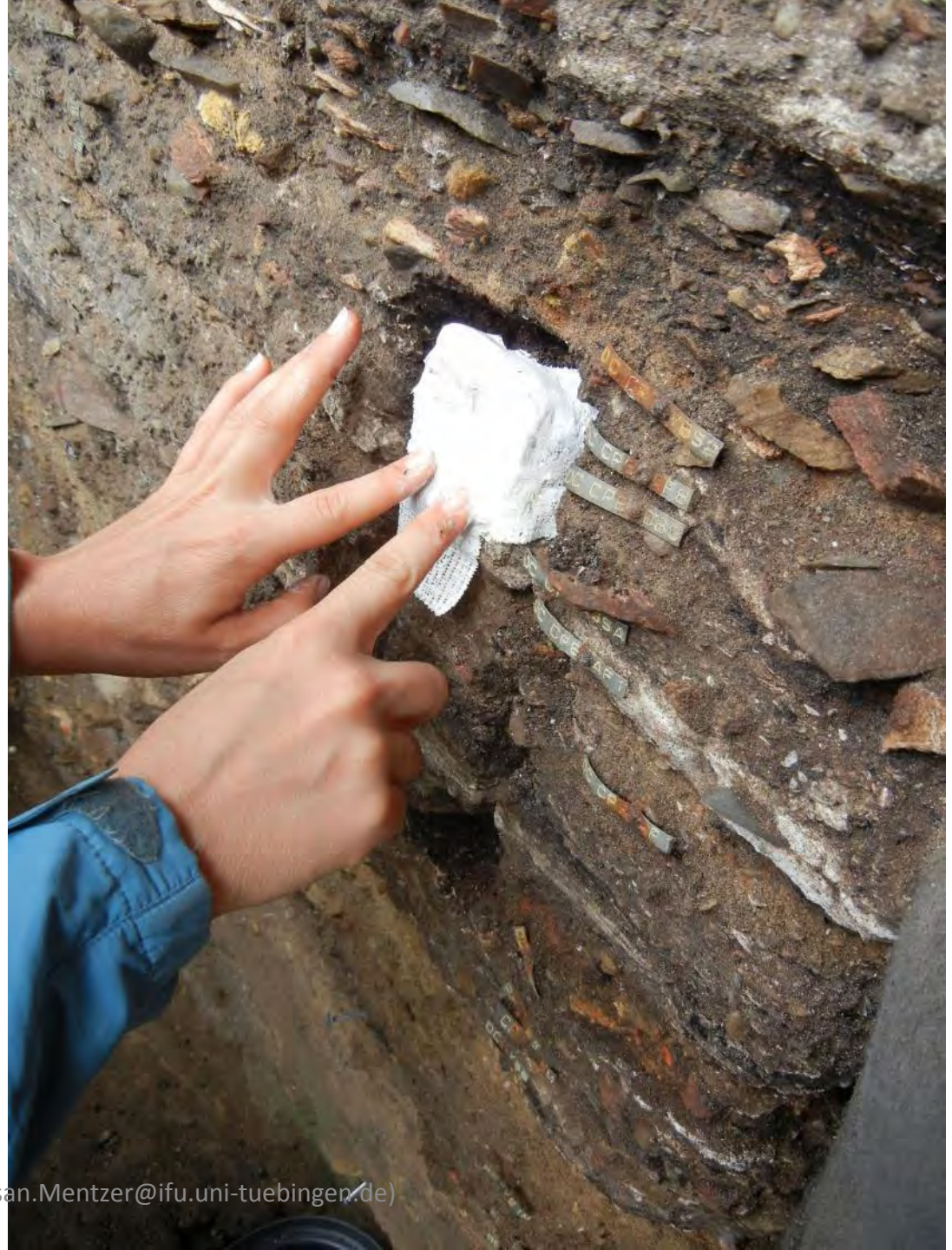
Apply more pieces, molding as you go

Work from the top, downwards

Secure new plaster pieces to the previous ones by pressing and molding with wet fingers

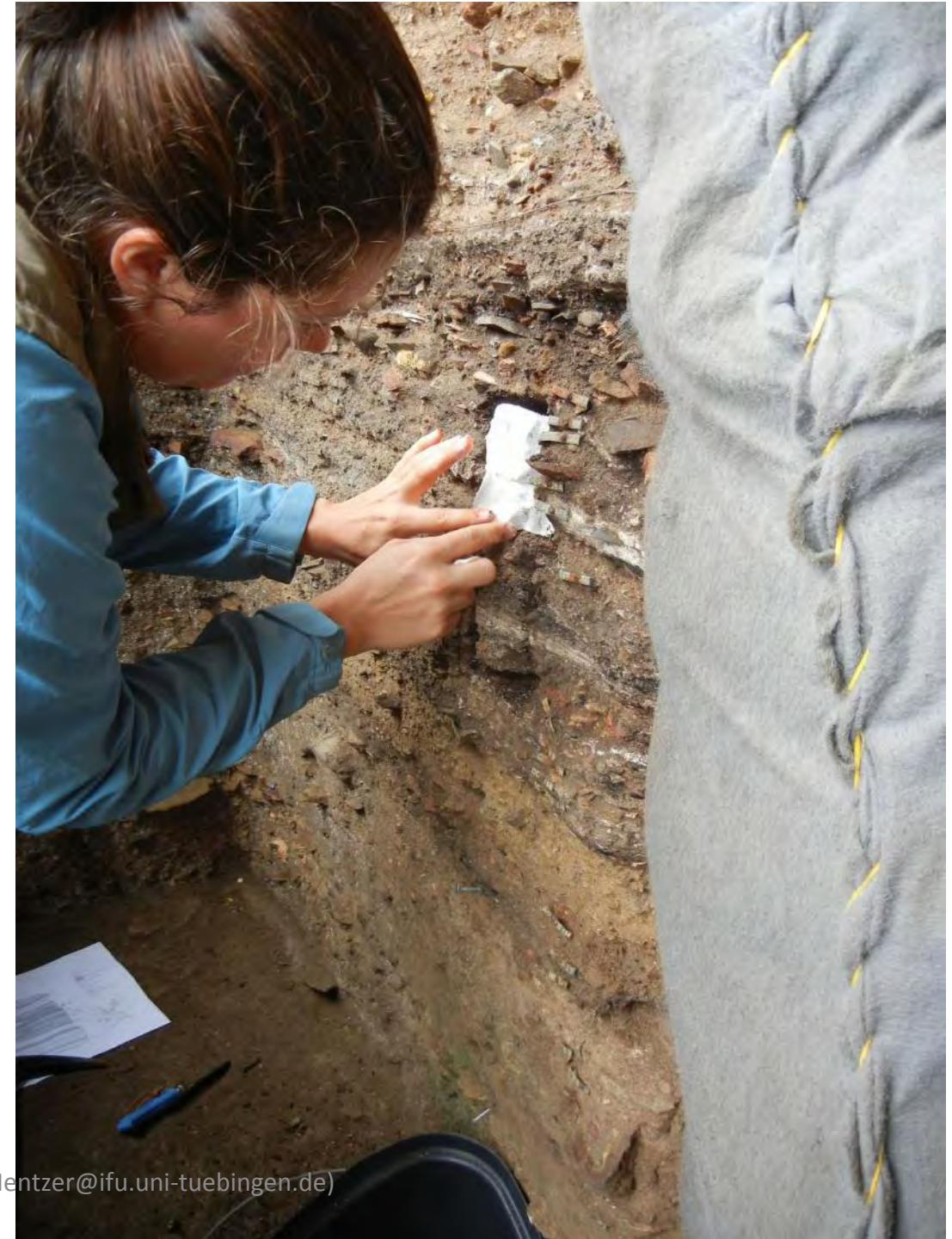
Aim for a thickness of at least two plaster pieces

Don’t worry yet about getting the plaster all the way back into the cut – focus on the front of the block



Try not to get dirt on the wet plaster – it will cause problems with hardening

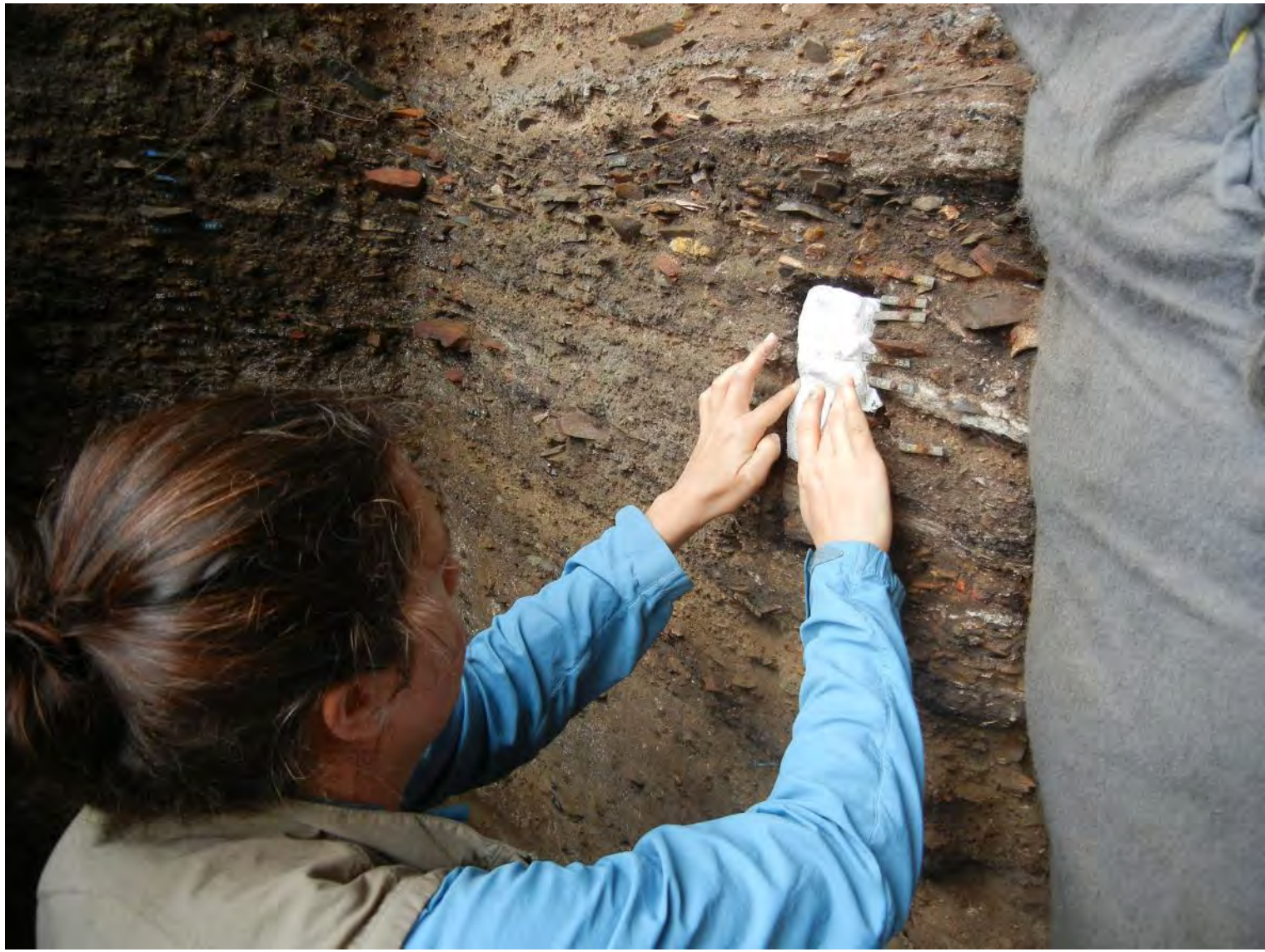
Rinse your fingers in clean water



Susan M. Mentzer (susan.Mentzer@ifu.uni-tuebingen.de)

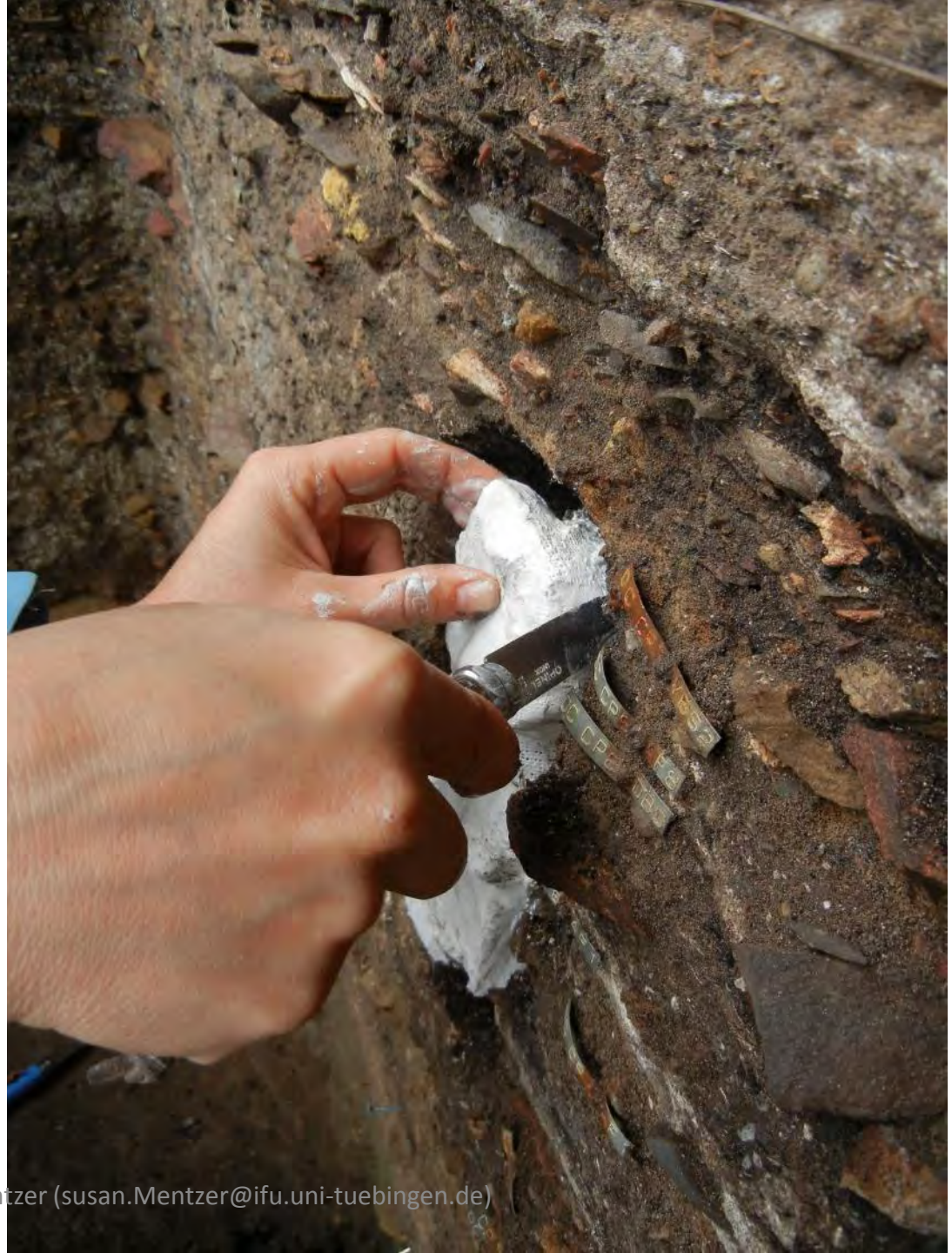
Cover the entire front face of the block

Work rather quickly



Use the flat edge of your knife to mold the plaster to the sediment inside the cuts

For this step, it is helpful to have a second knife



Use the knife to push more plaster to the back of the cuts

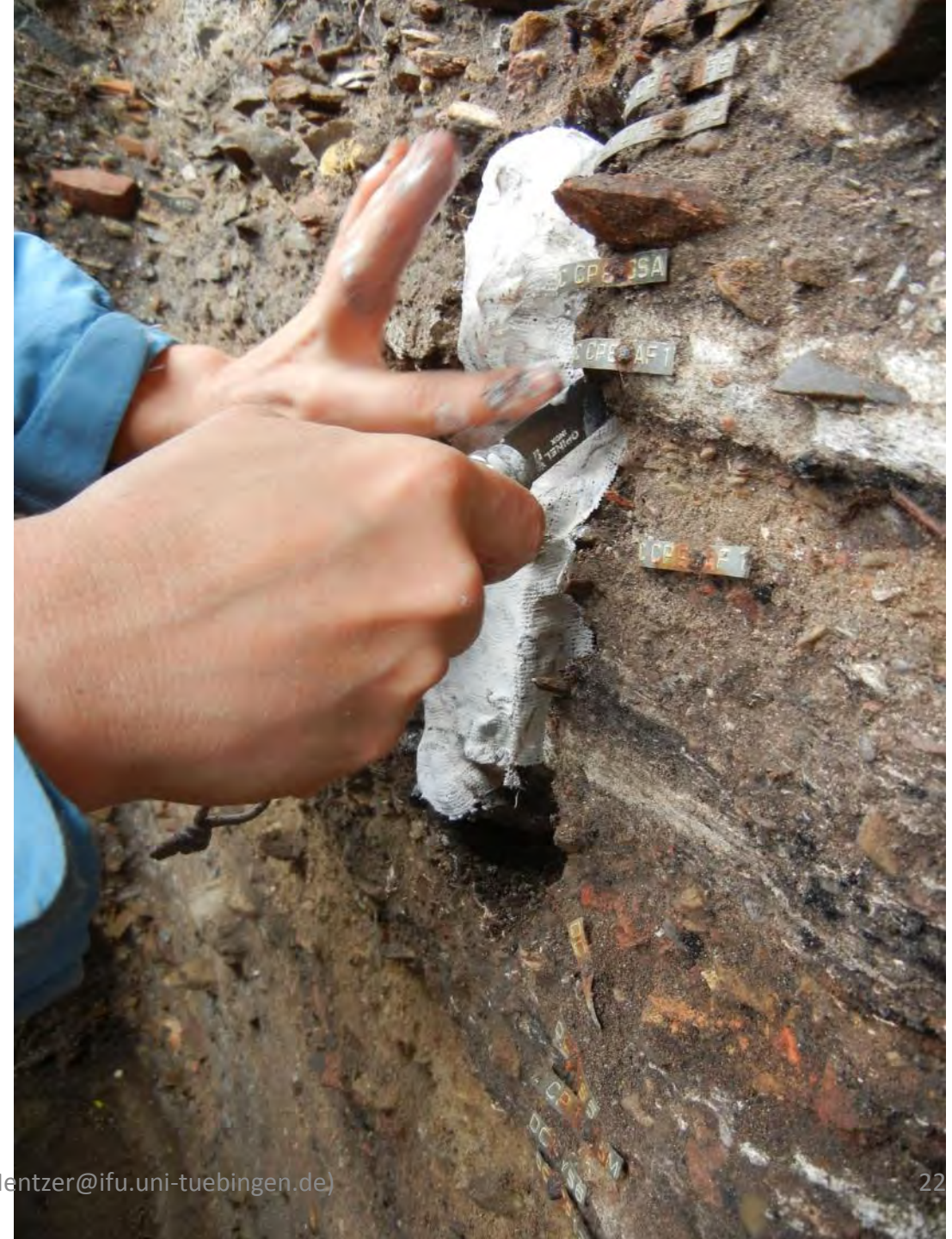
Wet the pieces of plaster, then fold them in half

Insert the knife into the fold, and then use it to push the plaster all the way to the back of the cut

Note that this knife is purple and the carving knife was blue. I like to use older knives for plastering and save the new, sharp ones for cutting.

Then use the knife to tuck in all loose edges and smooth the plaster, molding it to the shape of the block

Add new plaster all the ways down both sides



Now plaster the base

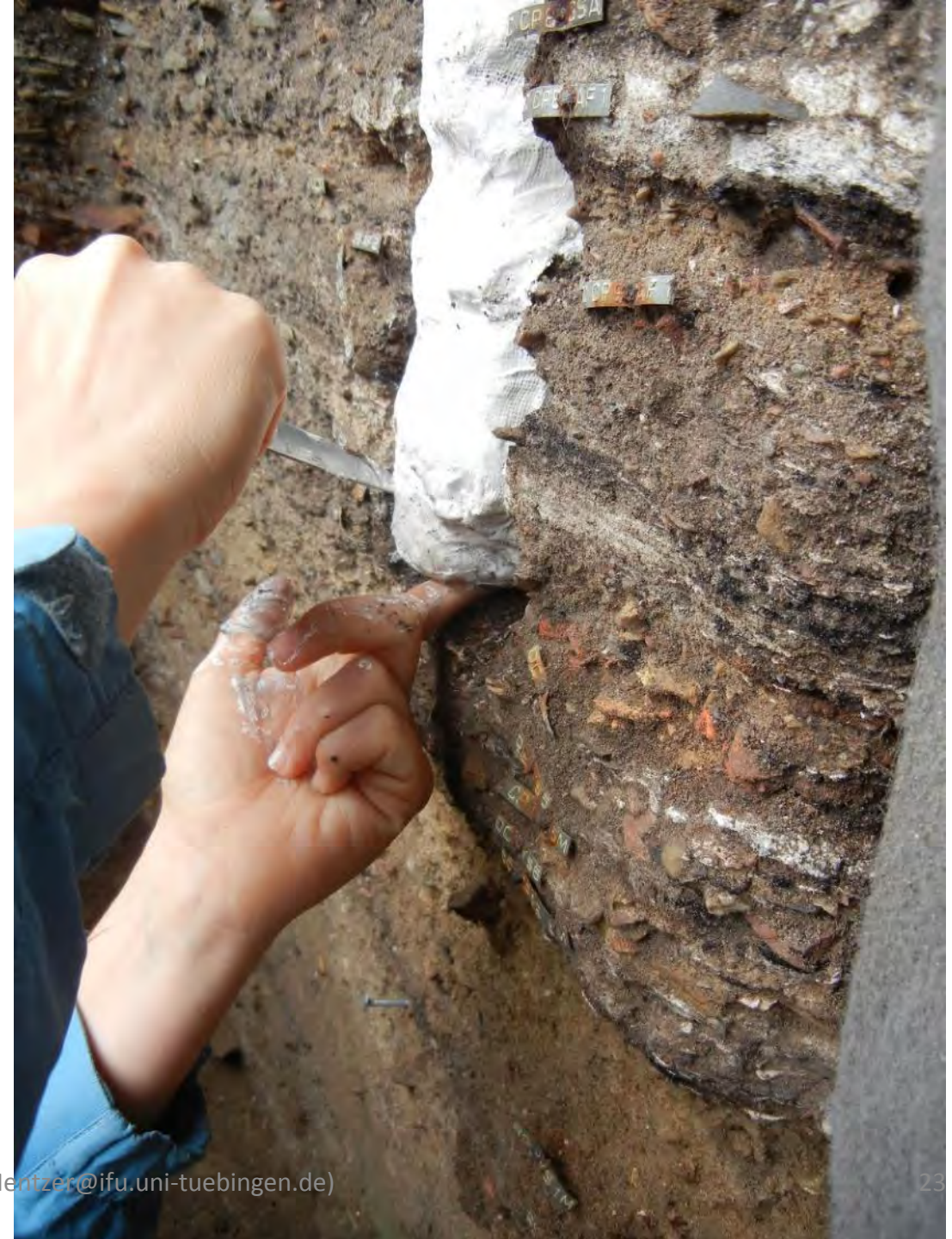
If you waited to carve out the base because it was unstable, carve it out now, making sure to keep loose sediment from contaminating the wet plaster on the edges

Take wet pieces of plaster and adhere the upper half to the front of the block, then tuck the lower half under the base of the block

Use a finger or the blade of the knife to hold the plaster up against the base as you add more plaster

Eventually the plaster will stay up on its own

Sometimes it helps to take a piece of plaster and make a kind of hammock, adhering the ends to both of the sides, and then pressing the center upward onto the base

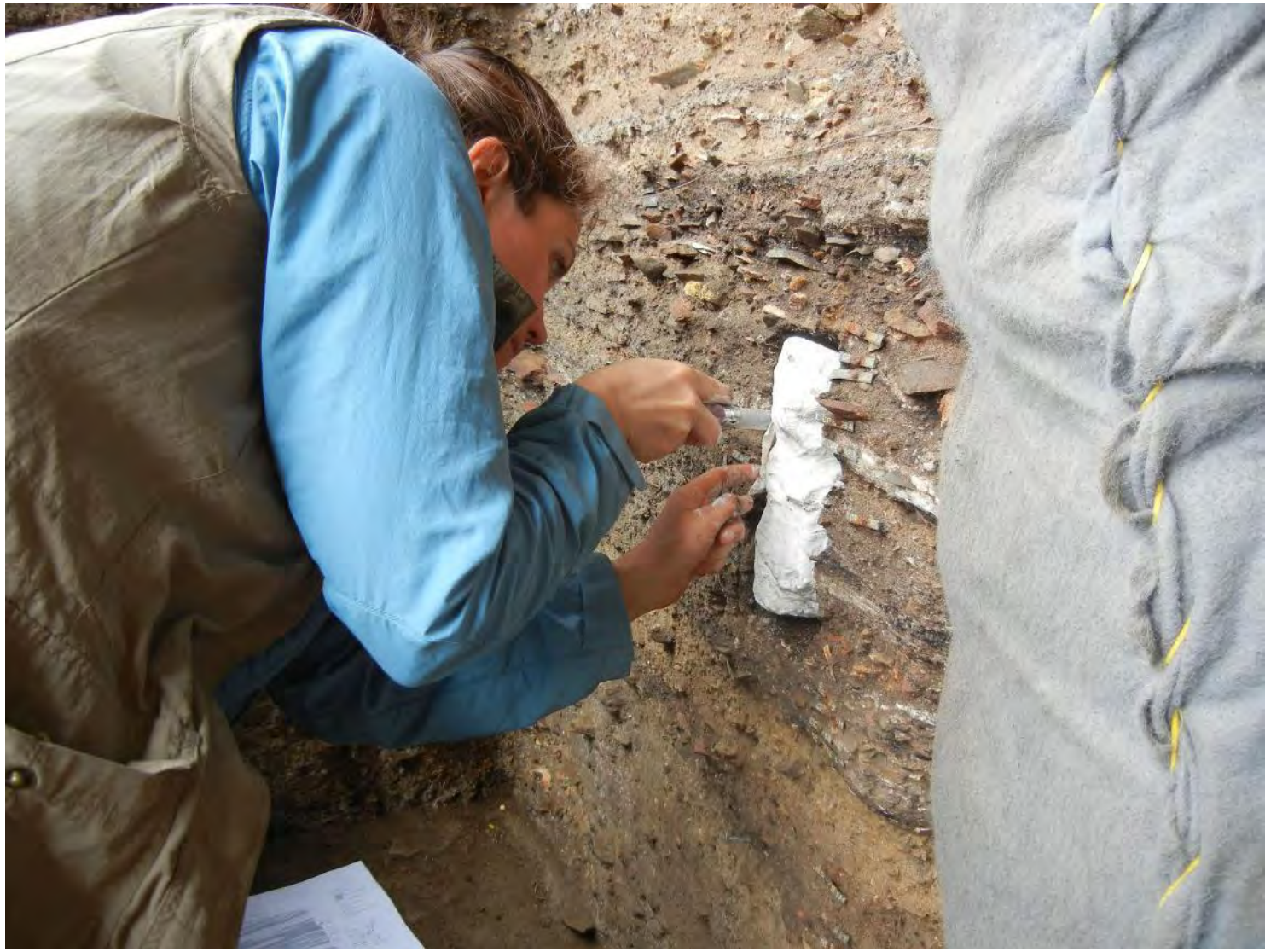


Wait for the plaster to dry for a few minutes

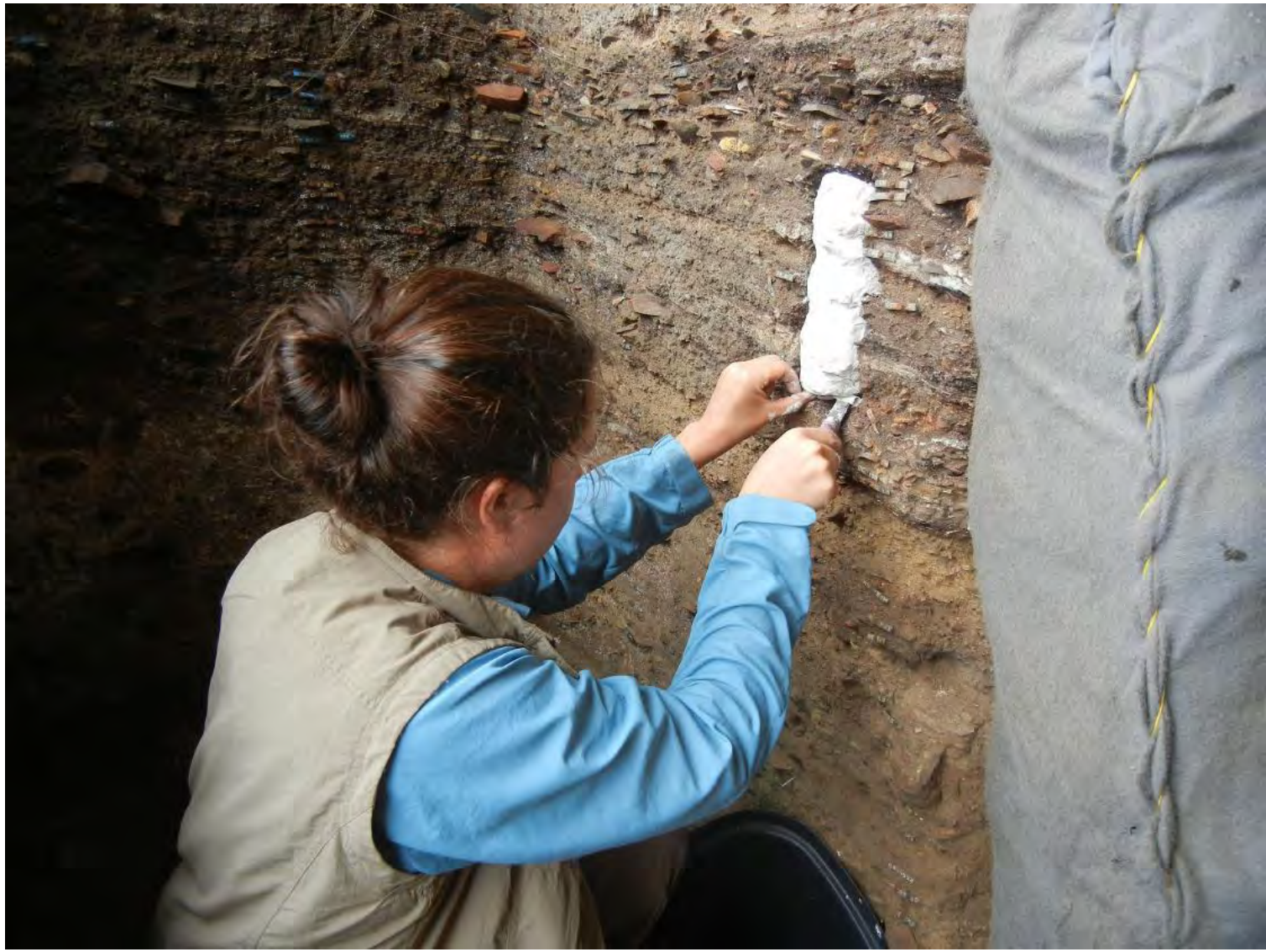
Depending on the humidity and sunlight, this may take anywhere from a few minutes to half an hour

It can be helpful to work on another sample while the first one dries

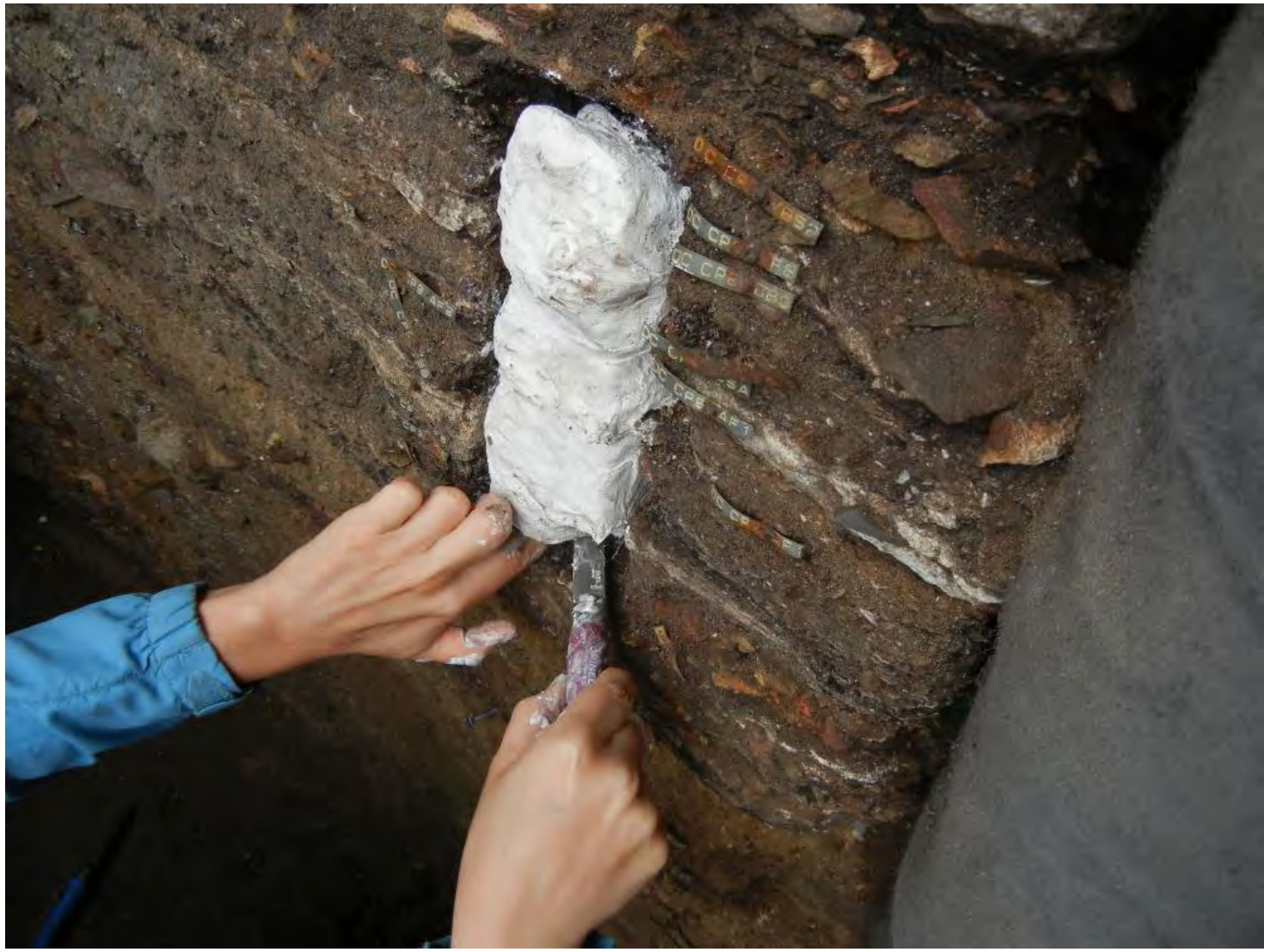
Then carve the sides slightly deeper



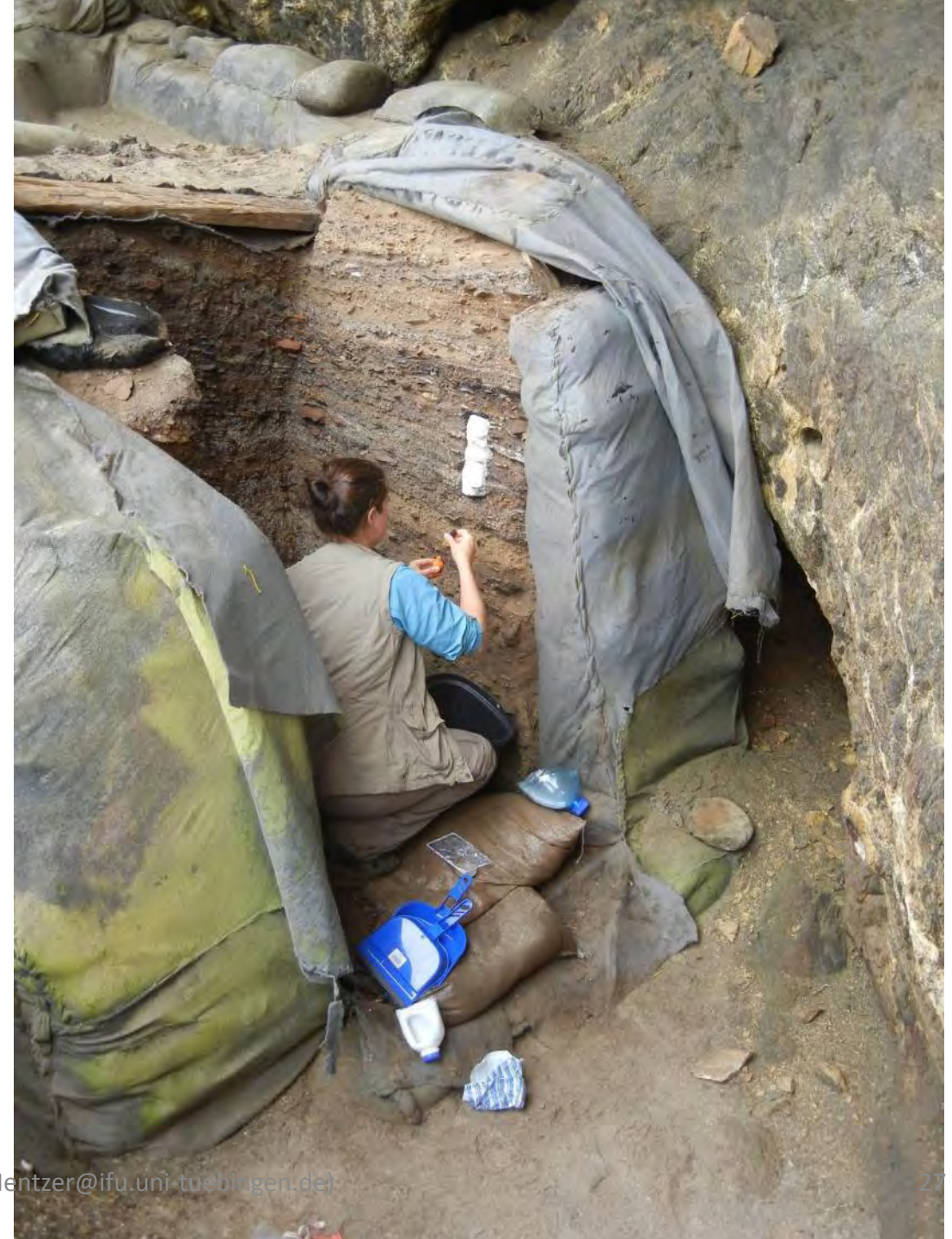
When the base is dry, carve a bit deeper, angling up and back



Add more plaster if necessary

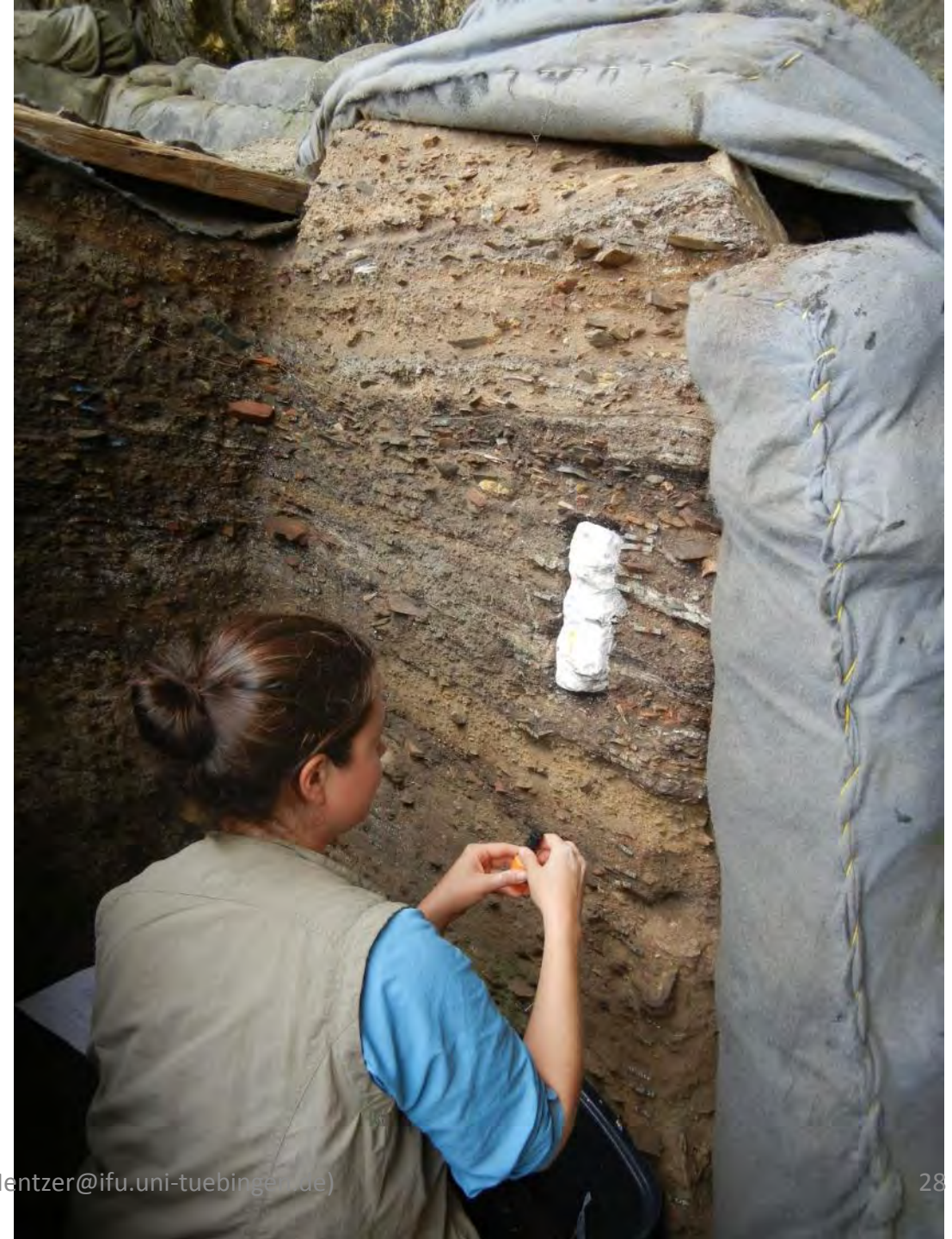


Prepare the sample for another photo



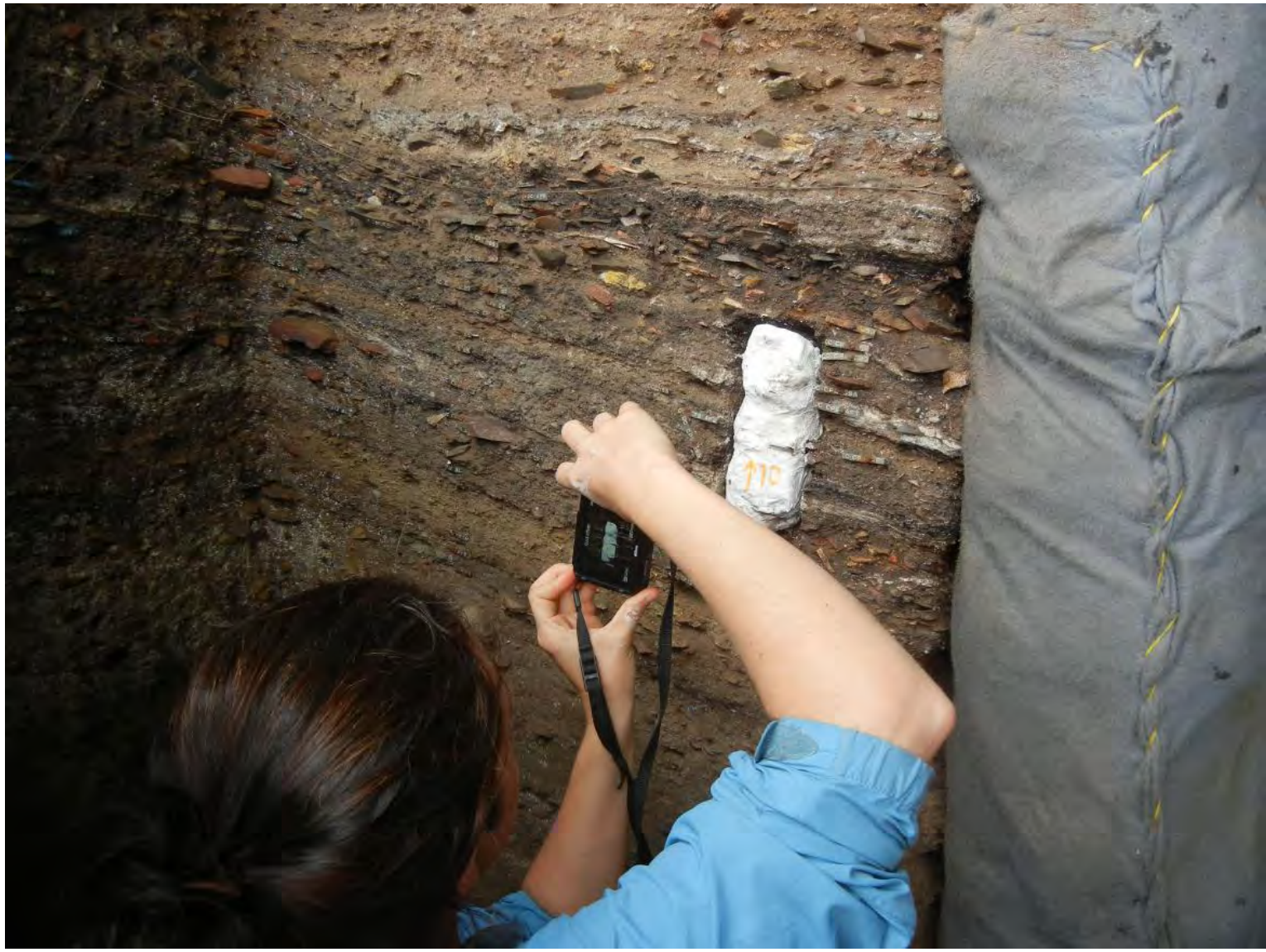
Use nail polish to apply an up arrow and a number

A marker might also work, but it is difficult to write on the plaster when it is damp



Take a photo

Make sure to place a scale bar on the profile



Take a few photos at various angles and distances

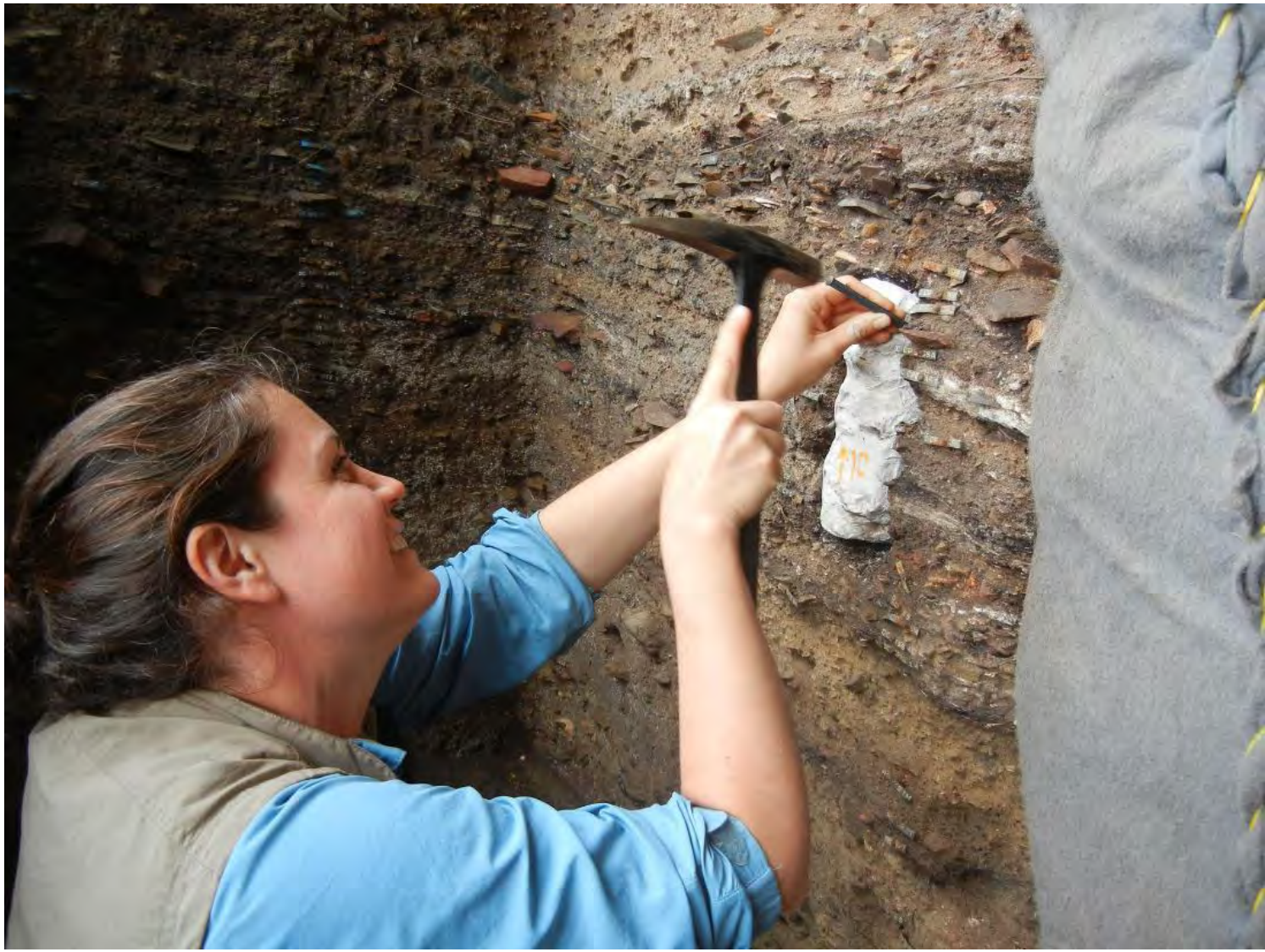
Now is also a good time to shoot in the corners of your sample using the total station

Gently hammer some fine chisels along the edges

Your aim is to produce a series of holes angled towards the back and center of the block

Screw drivers work ok too

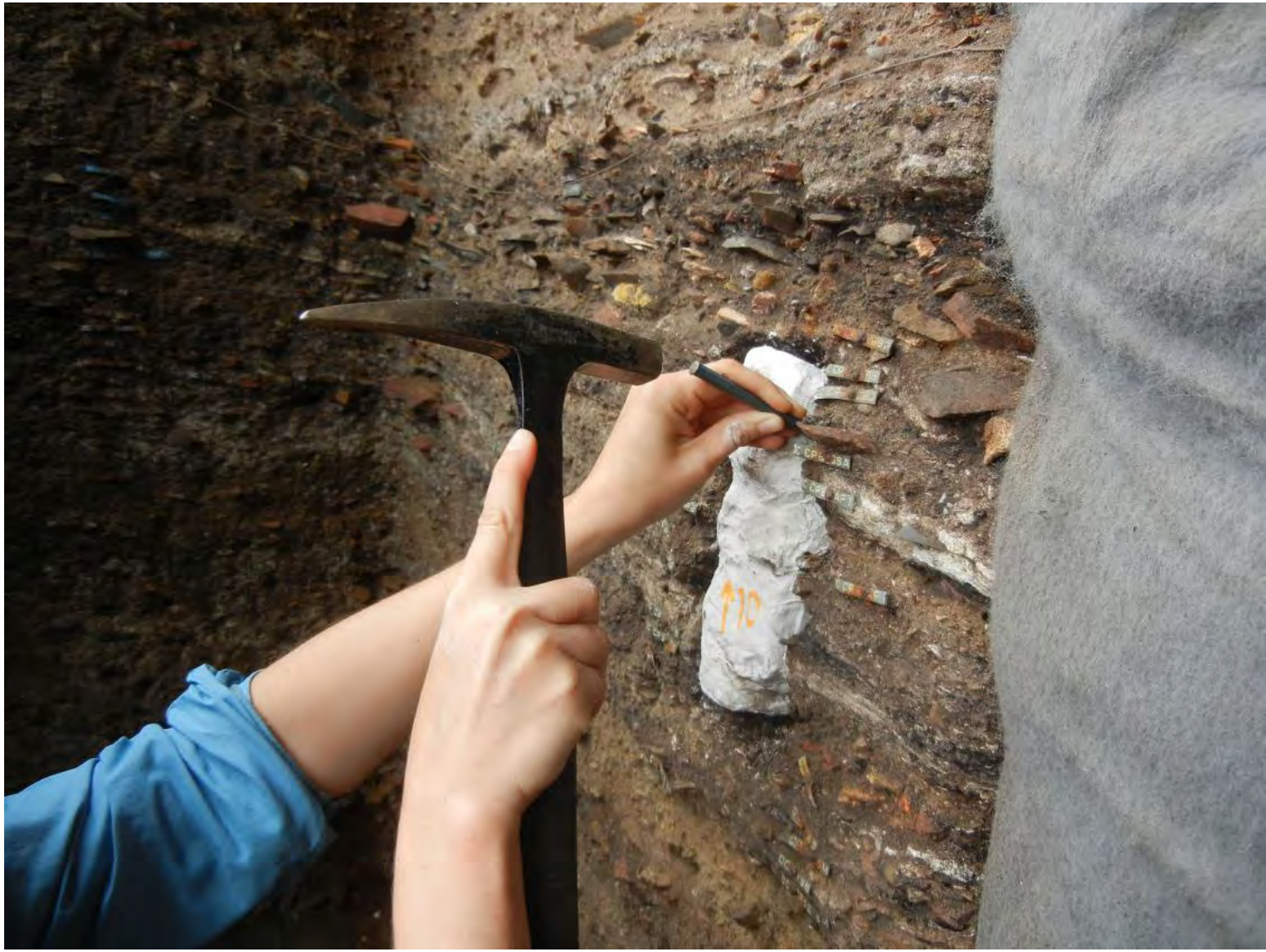
Note: hammers and chisels may not be necessary. In some cases, the sediment is soft enough to use your knife.



Work down the edges of the block on both sides

You want to generate a crack along the rear face of the block

Again, you may be able to do this with just a knife, or by slightly pressing the block left and right



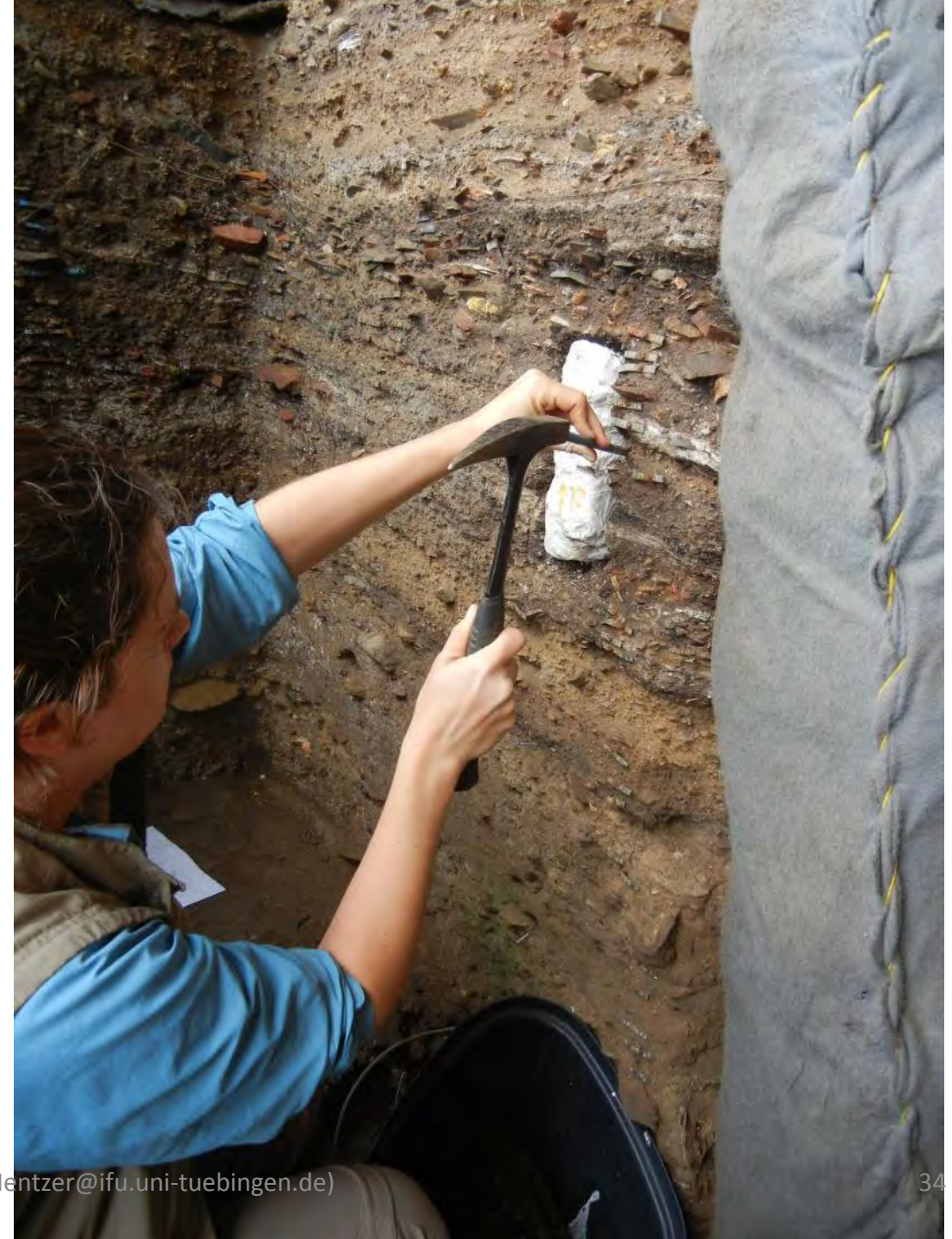
You will feel the block start to come loose

At this point, try to loosen it a bit more with your knife

You want to find all of the places where it is still “sticking” and help to extend the crack to these areas

Side to side movement is better

Use the chisel on difficult spots



Now you want to work with two or three chisels

Hammer one into the upper corner, angled down and towards the center of the block

Hammer one into a hole along the side, angled towards the back

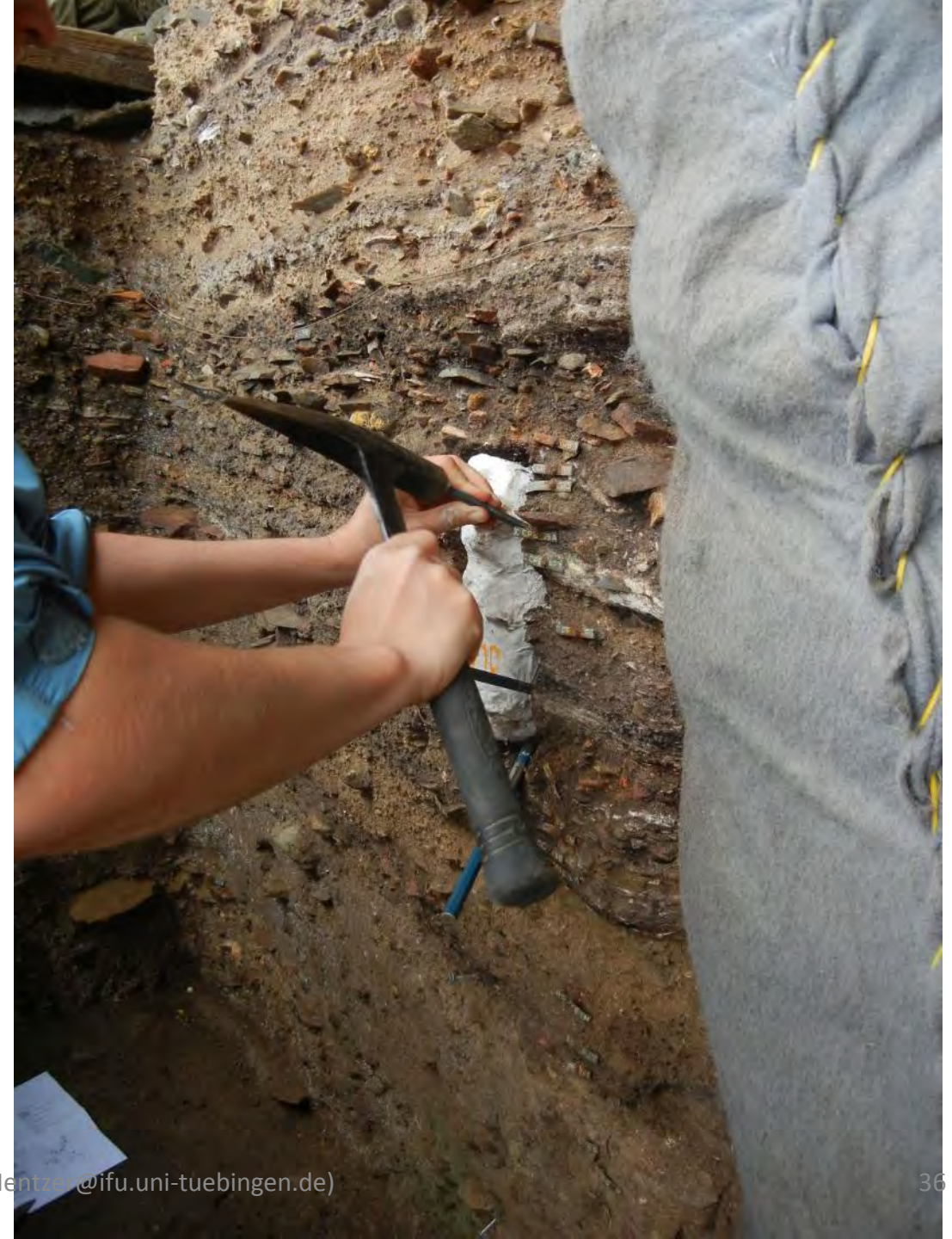
Hammer a third into the base, angled upwards

Once all three chisels are in place, gently tap each one in succession

Start by tapping the chisels further in

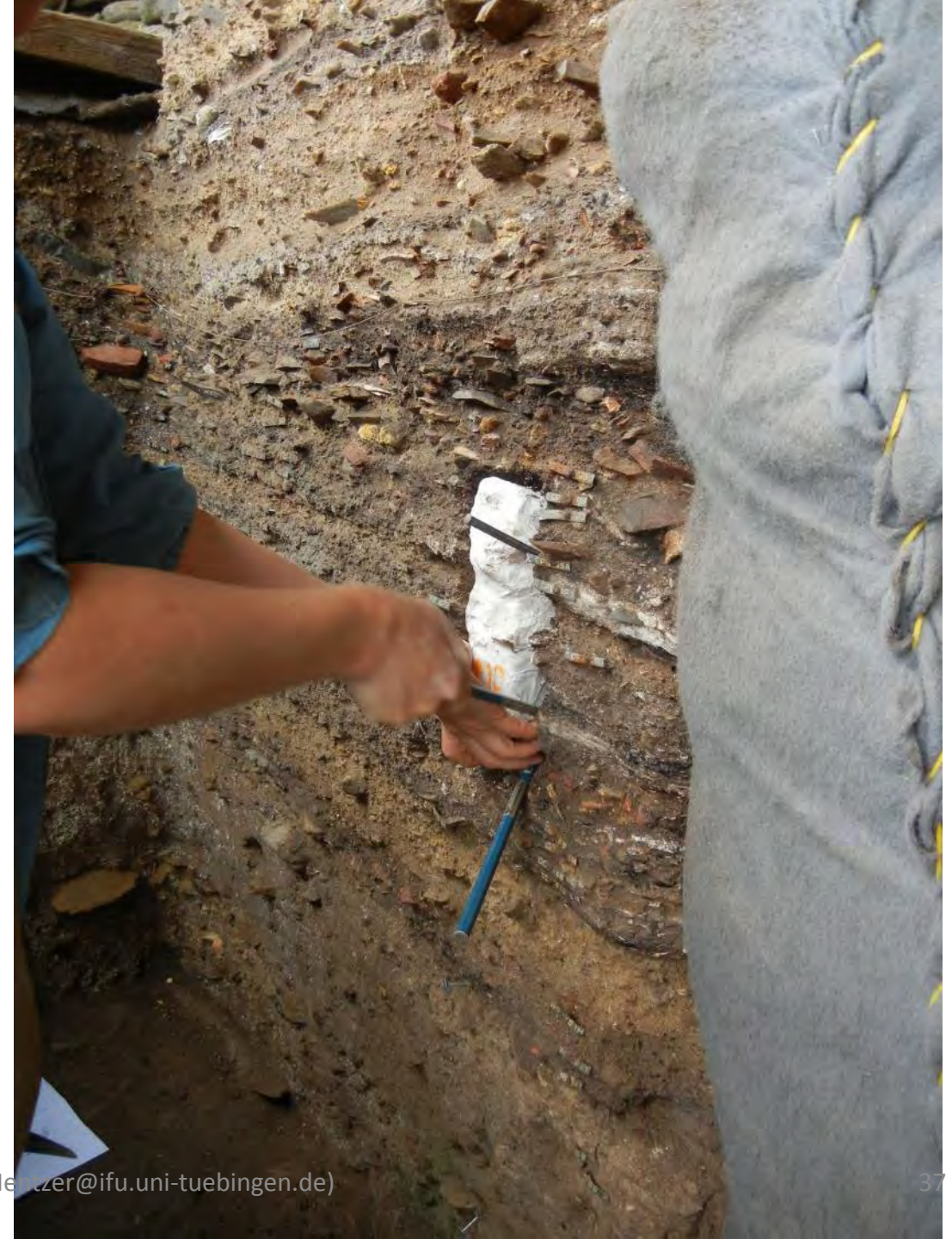
You may have to remove one or more, and move them to a better location

Then gently wiggle the chisels from side to side



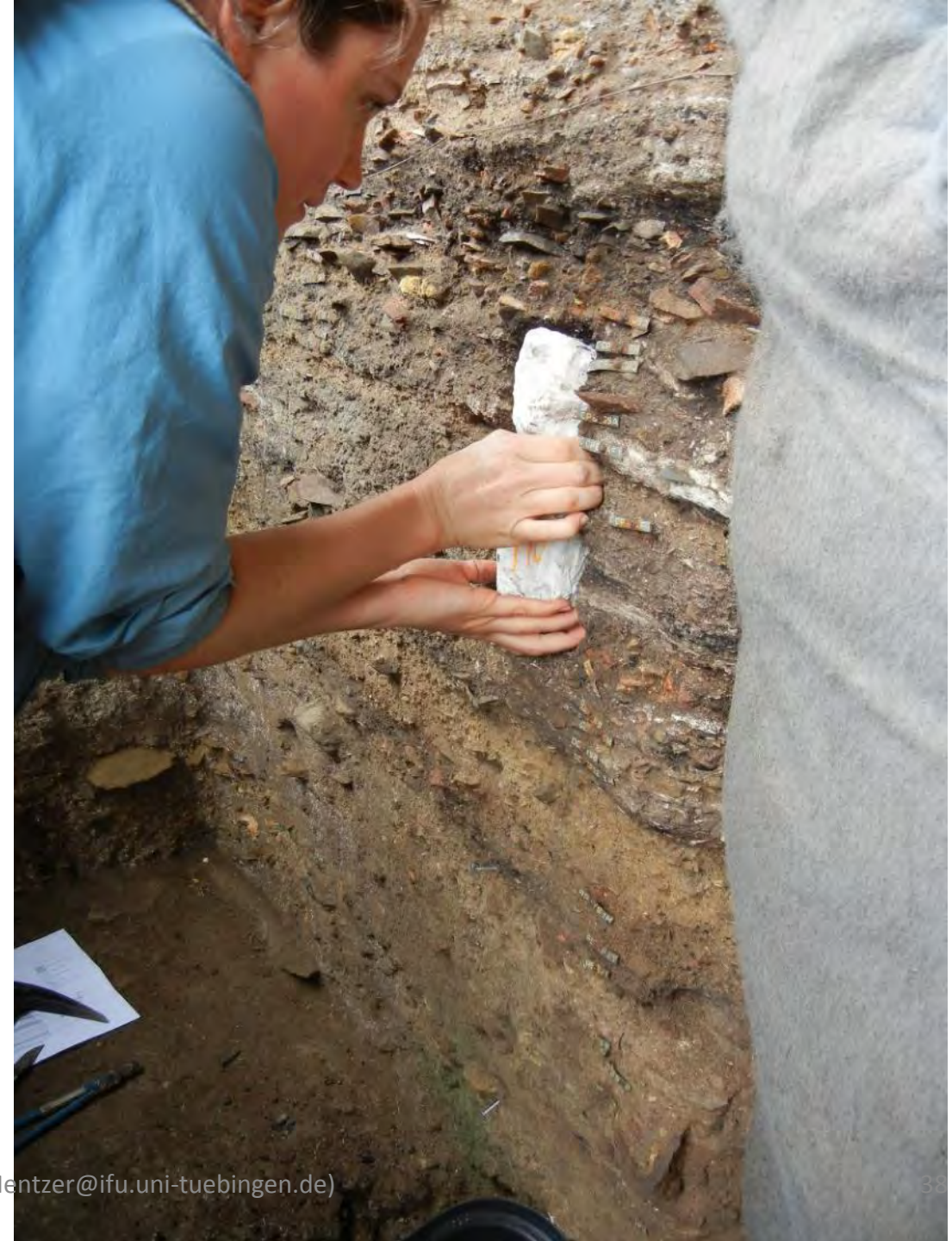
Move the chisels like levers

Gently press the chisel against the side of the block



When the block is ready to come out, remove the chisels

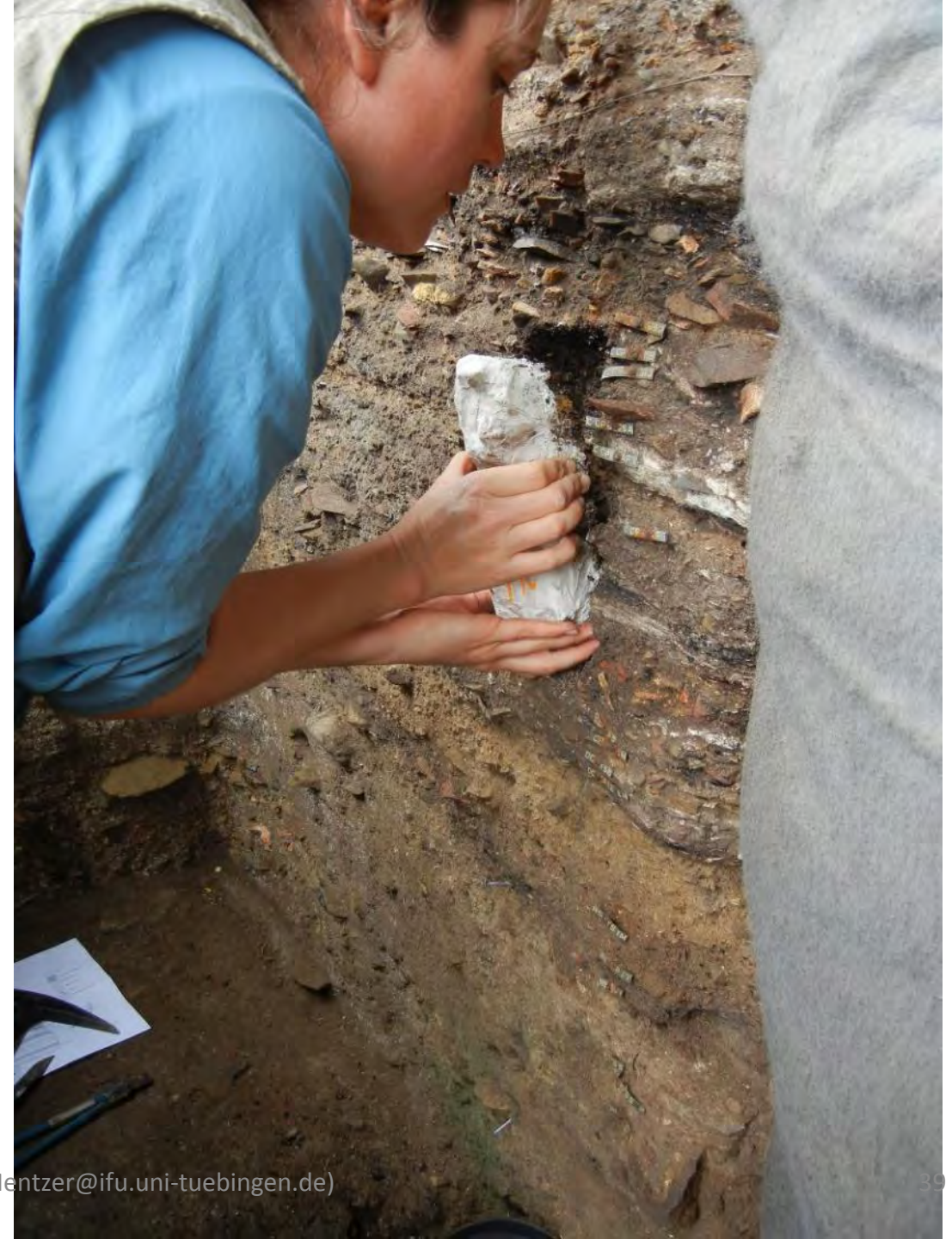
Grip it carefully with both hands, supporting the base



Tip the block back towards you

Watch carefully to see if there are pieces of sediment that are sticking

Wiggle gently to loosen these, if possible



Continue to pull the block out until it is horizontal

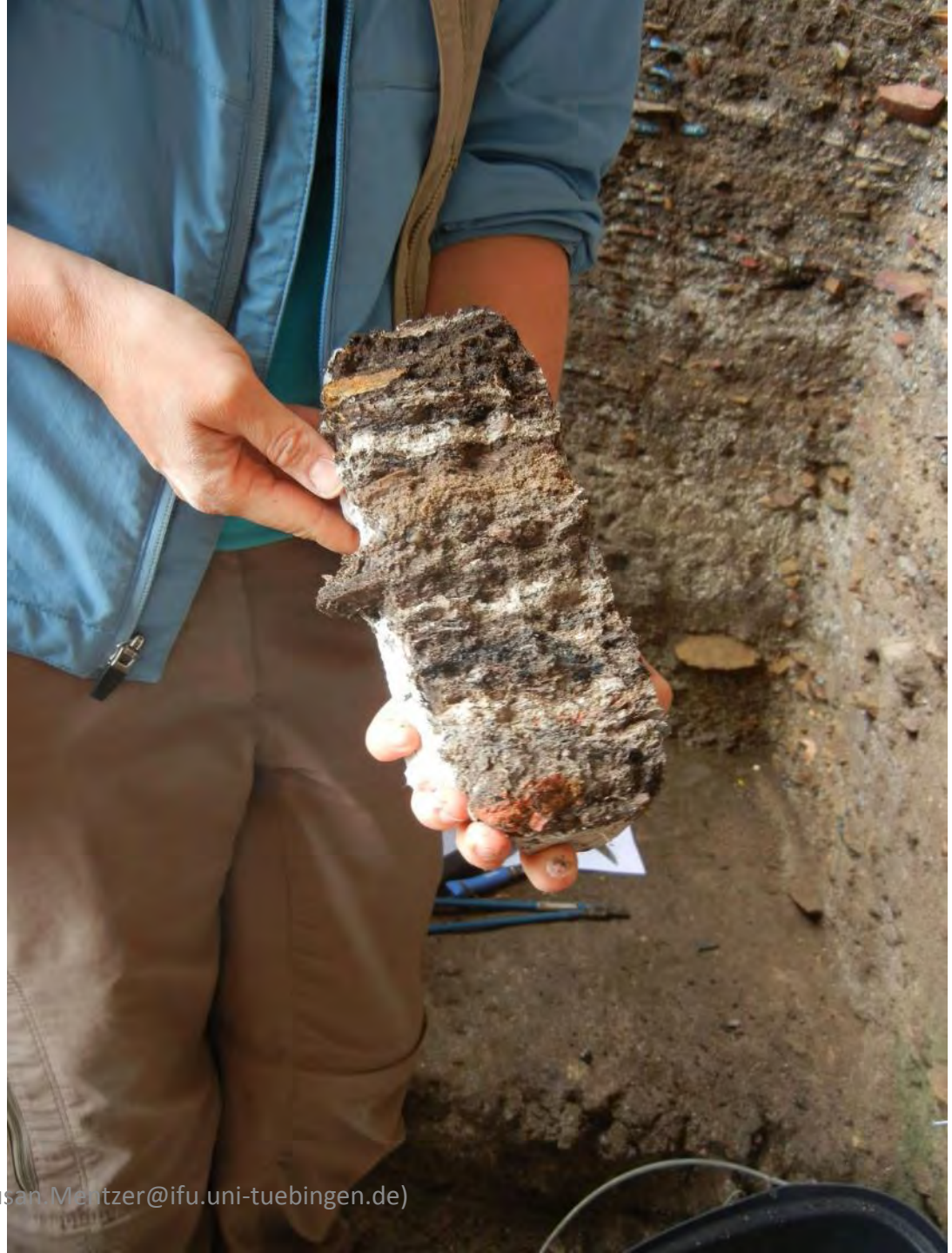
Watch for cracking, and support the block

This one came out in one piece

Note the rock sticking out the side – trying to remove this during carving would have destroyed the block

Sometimes the blocks crack or even break. Hopefully the plaster will help to hold them together. Cracked blocks can still be analyzed!

Sometimes part of the block remains in the wall, and you are left with an empty plaster shell at the top or bottom. If you can remove the remaining piece and fit it back in, that is best. Otherwise, document the missing pieces, and replaster the new base of the sample.



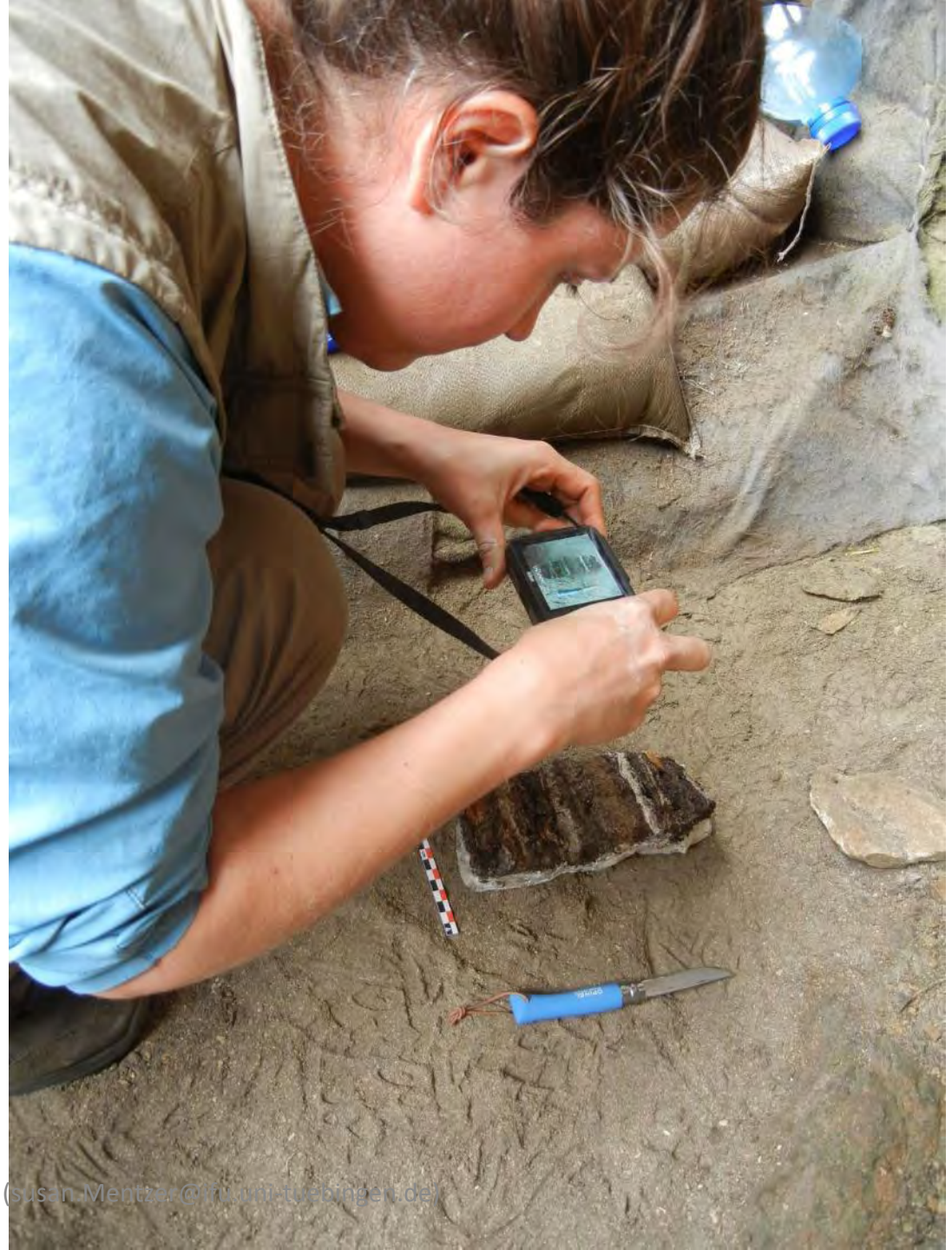
Photograph the back of the block

Scale bar at the base

Knife along the edge, pointed upwards

A note card with the sample number written on it is also useful to include in the photo

If there is a very important feature or layer, take at least one photo using the point of the knife to indicate the location



Collect loose samples of all layers of interest

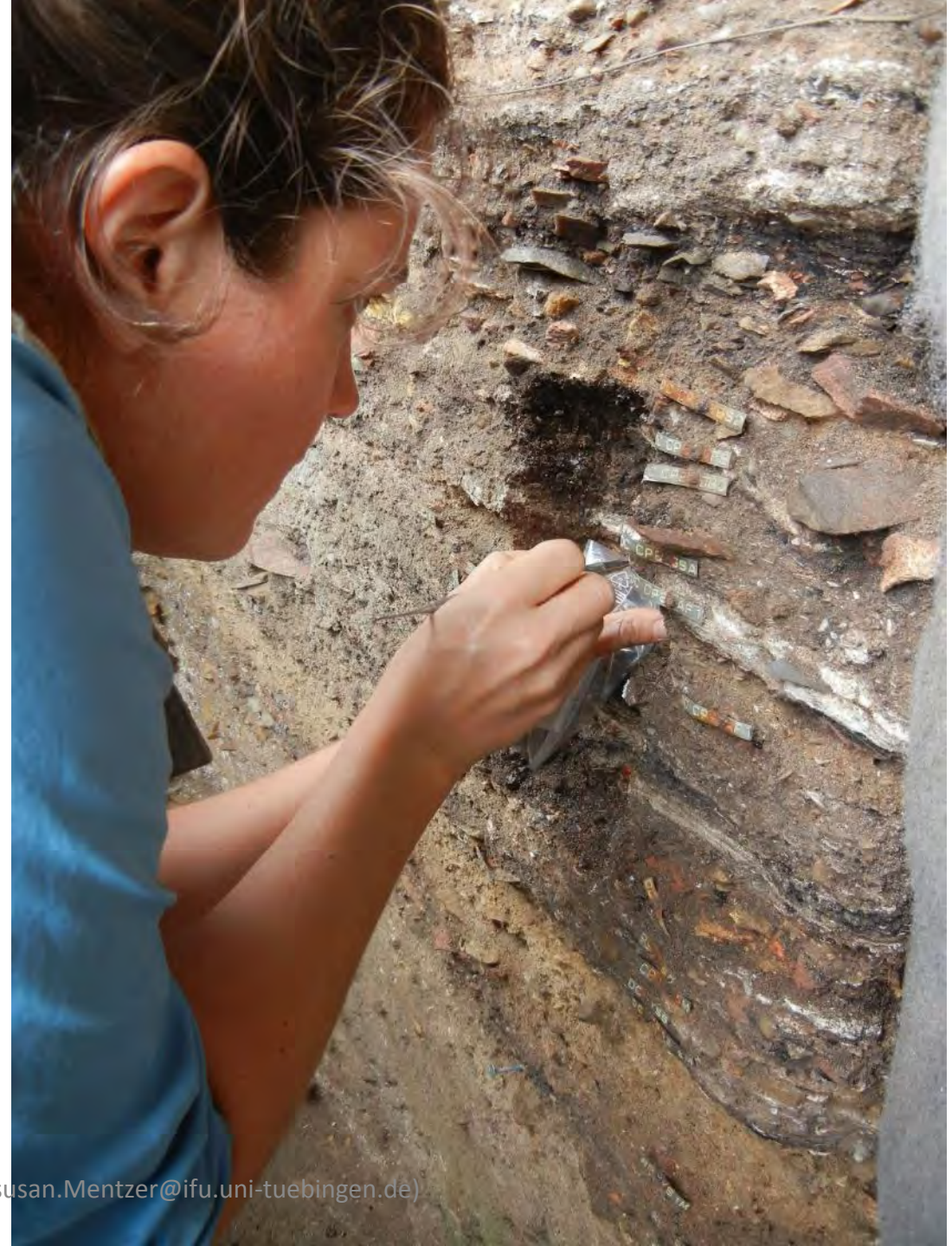
Don’t add more holes to the profile – remove the loose sediment from the sample scar

Work from the base to the top so falling sediment doesn’t contaminate the areas beneath

If it is important to enter the sample locations into the coordinate system, then put colored pins into the hole to indicate where the samples were taken

Take photographs of the sample scar, and loose sample locations, indicated by pins or the tip of your knife

It is also possible to take small samples directly from the back of the block, including removing charcoal for dating



Example of a loose sample removed from the back of a block

The colored pin shows the location of the sample

In this case, the sample was a secondary mineral nodule that was small enough to fit into a vial

I recommend collecting these types of small samples prior to plastering, although it is also possible to carefully cut away the plaster from one side of the block when you are back in the lab

Note: this is not the same block as the other photographs and this is not from Klasies River.

Label your loose samples

A tag inside the bag provides redundancy

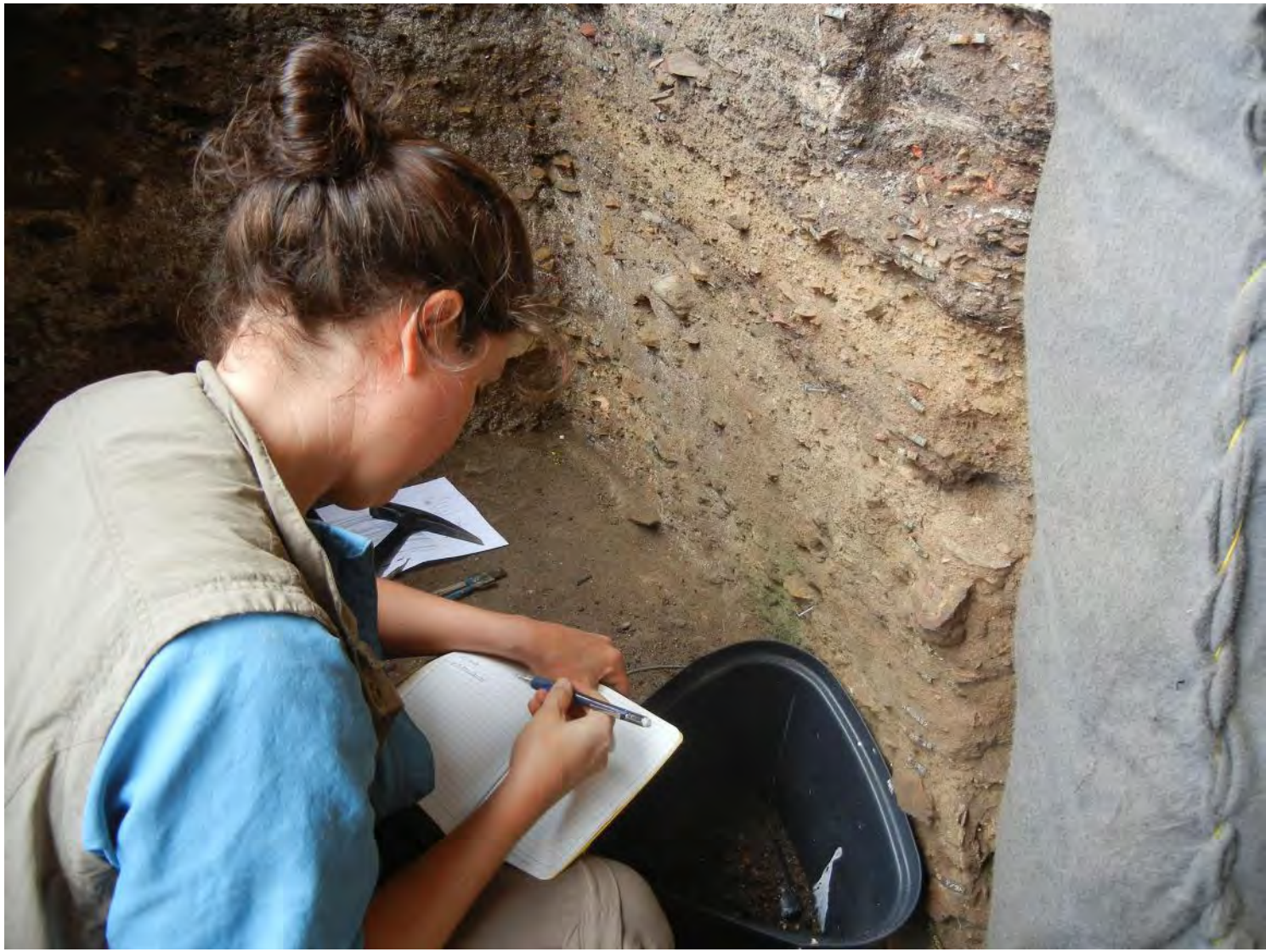
Take notes

Describe your block sample

Note all of the layers or features that are present

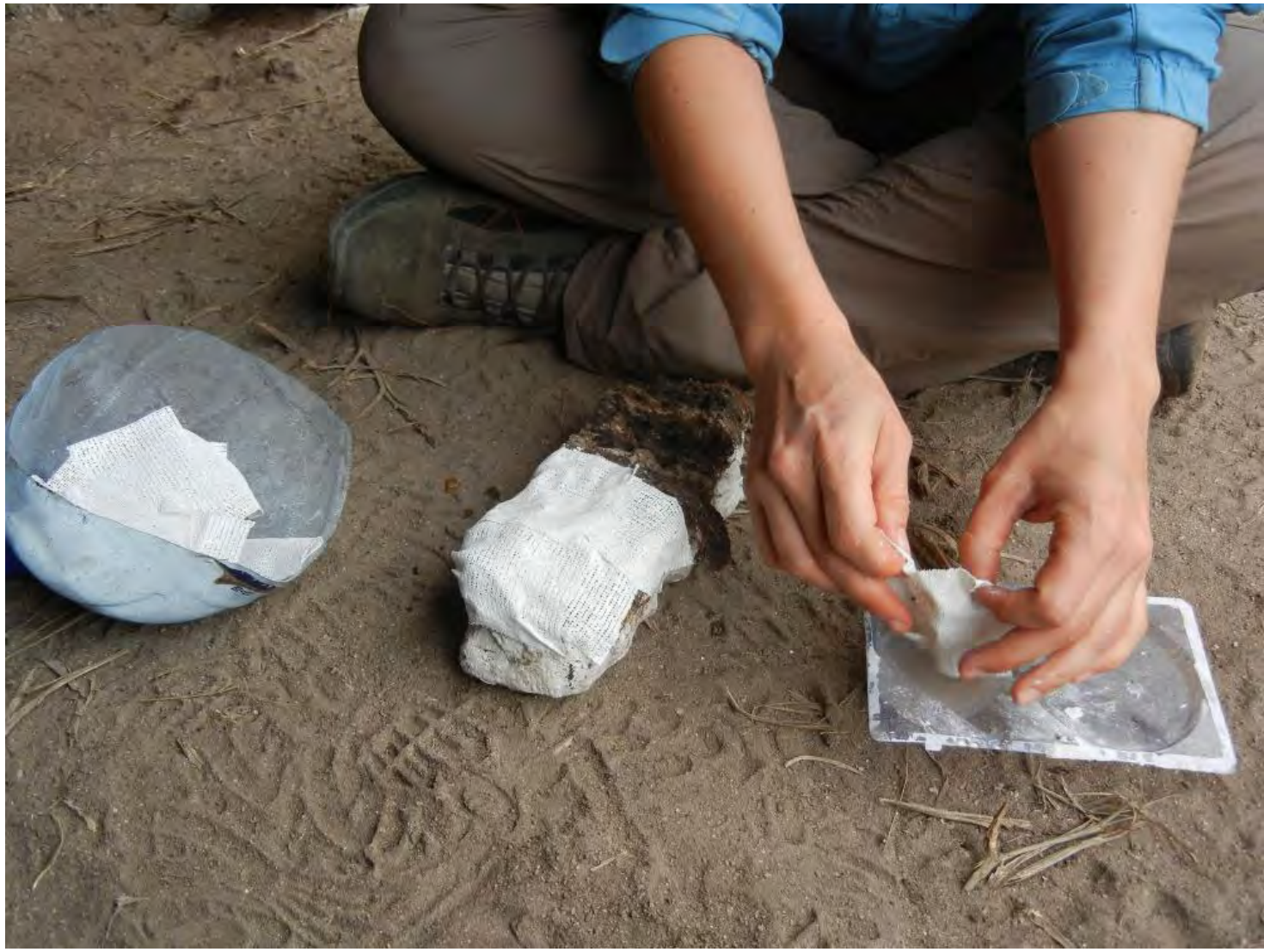
If there is an important feature, specify where it is located within the block

Describe any problems with the block. Is it cracked in the middle? Is there a burrow along one side? Did you have to put a clump of sediment back into place?



Cover the back of the block with plaster

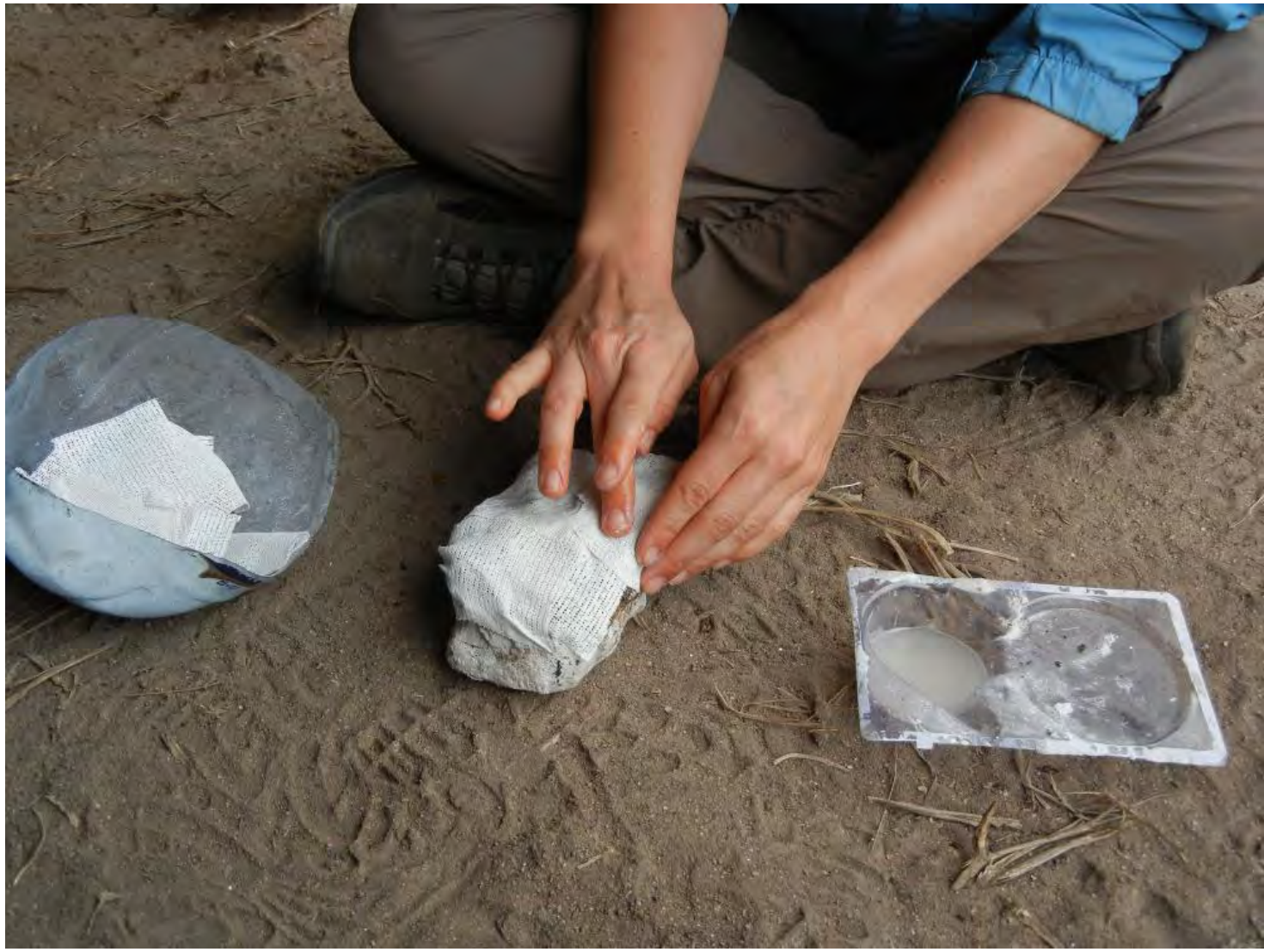
Drape the pieces along the back, making sure to overlap with the plaster that is already on the sides, top and base



Cover the entire back

Add more pieces to the edges, top and base, if necessary

Make sure the corners are sealed



Smooth the plaster with your fingers

Make sure it molds to fill in all of the depressions

Allow the block to dry for at least 30 minutes before transporting away from the site