

Rhino anatomy - old (& new!) research helping animals today

Ultimo aggiornamento: circa 7 mesi fa 

I was contacted by a wildlife veterinarian in South Africa who is tending to two rhinos that were horribly wounded by poachers who hacked off their horns and caused other injuries. A third rhino died of its wounds. The photos he sent me are too horrific to share. At his request, I assembled the following anatomical images on

the nasal region and sinuses that I sent to him. I may add other images of our dissection at a later time.
WARNING: there are a couple graphic dissection images.
If you want to help the rhinos, go here:
<http://bit.ly/zUJLel>.

32-year-old female white rhino (OUVC 9541)



etal
ion

with the horns above the nasal cavity was removed (and damaged) during

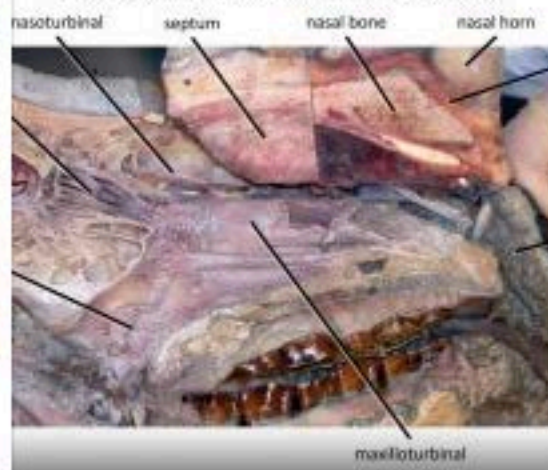
32-year-old female white rhino (OUVC 9541)



ore skeletal
preparation

with the horns above the nasal cavity was removed (and damaged) during

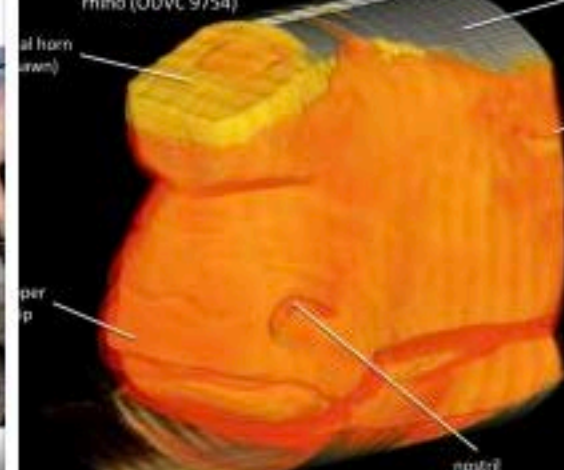
32-year-old female white rhino (OUVC 9541)



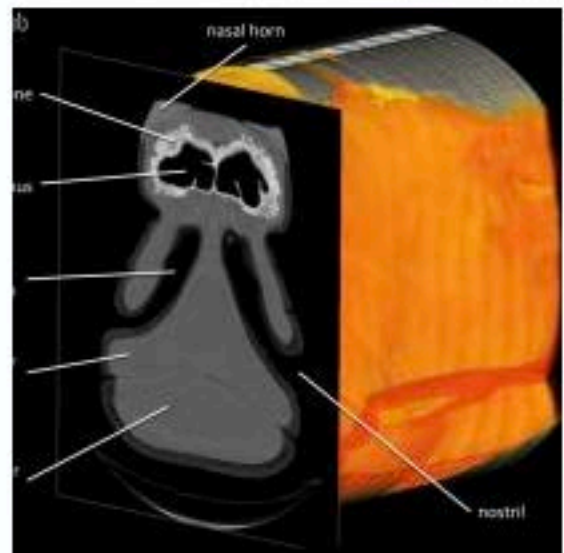
nasoturbinal septum nasal bone nasal horn
maxilloturbinal

the mucosa covering the turbinates/conchae was damaged during necropsy

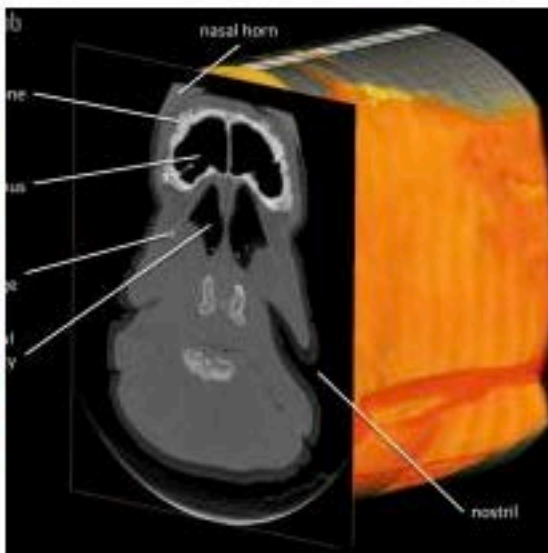
41-year-old male white rhino (OUVC 9734)



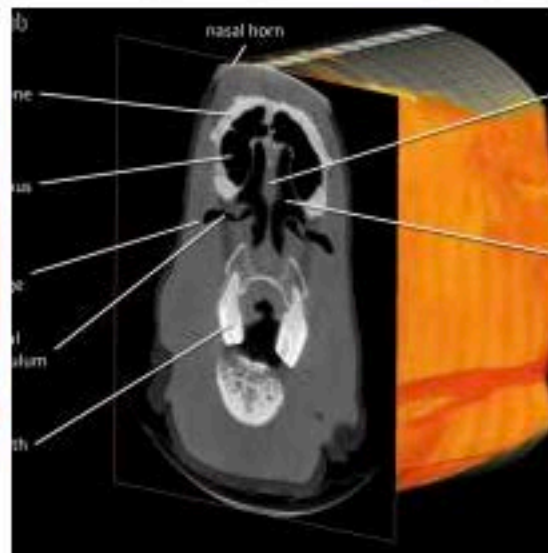
nasal horn
nostril



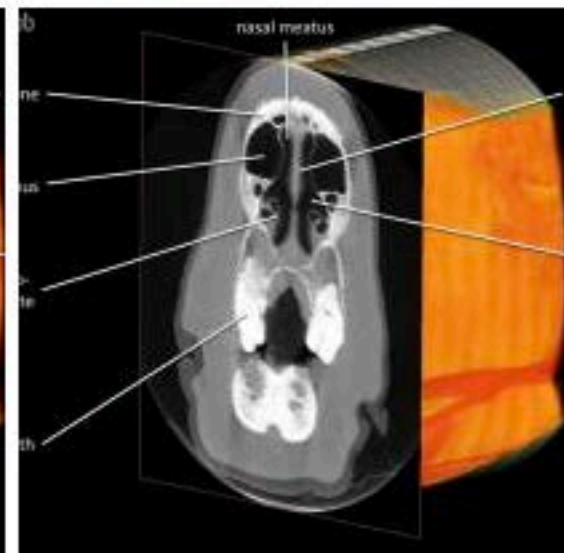
nasal horn
nostril



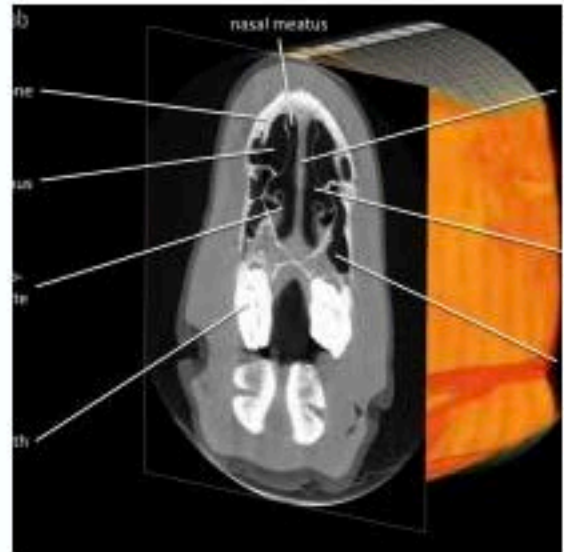
nasal horn
nostril



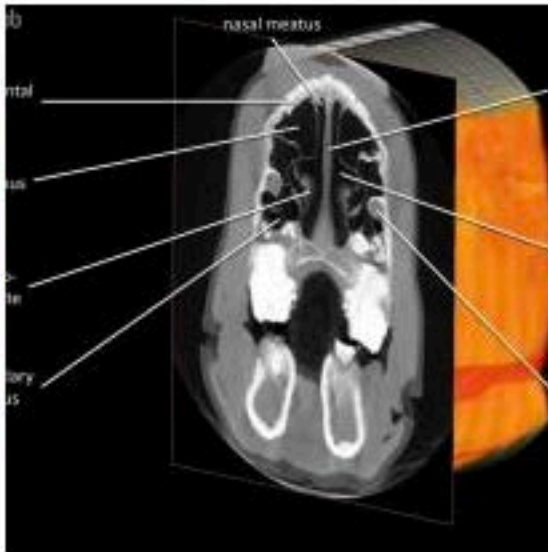
nasal horn
nostril



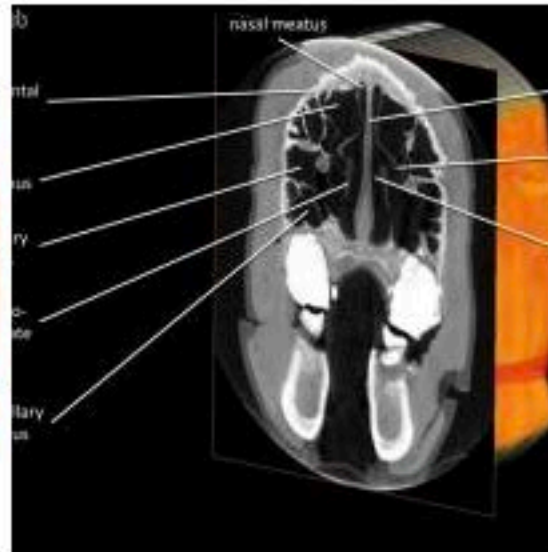
nasal meatus
nostril



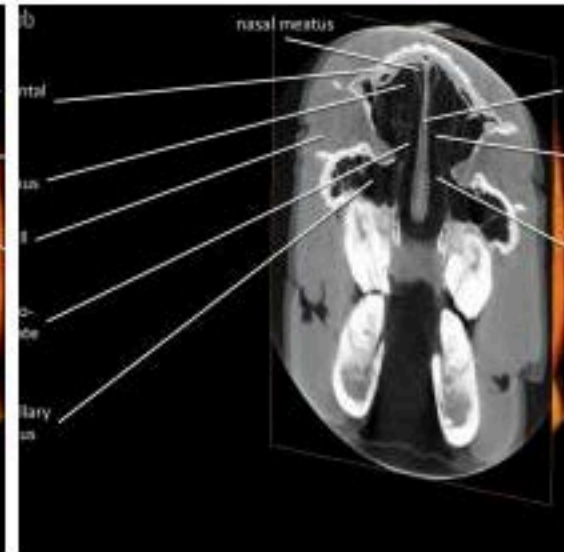
nasal meatus
nostril



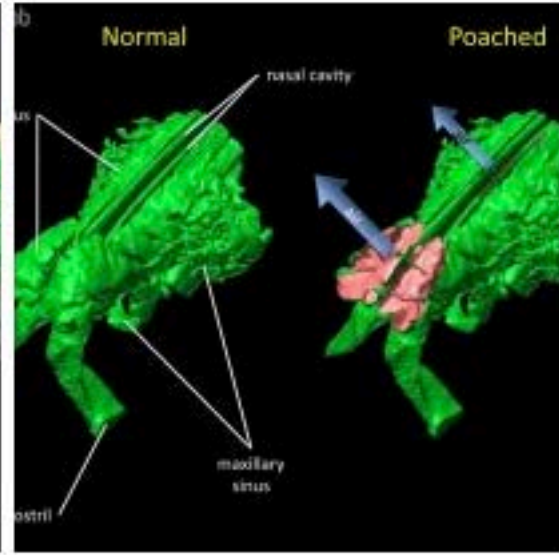
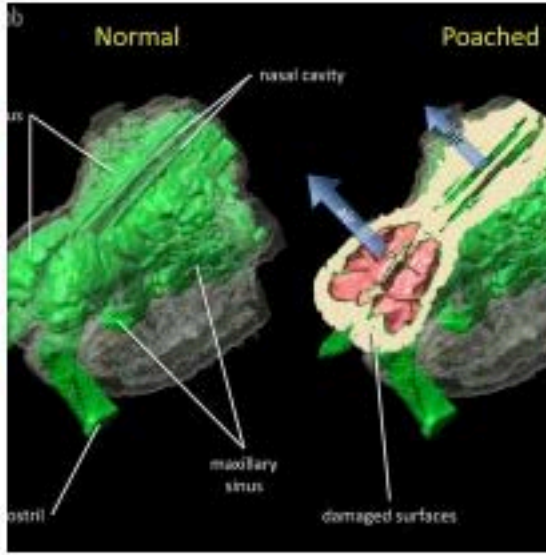
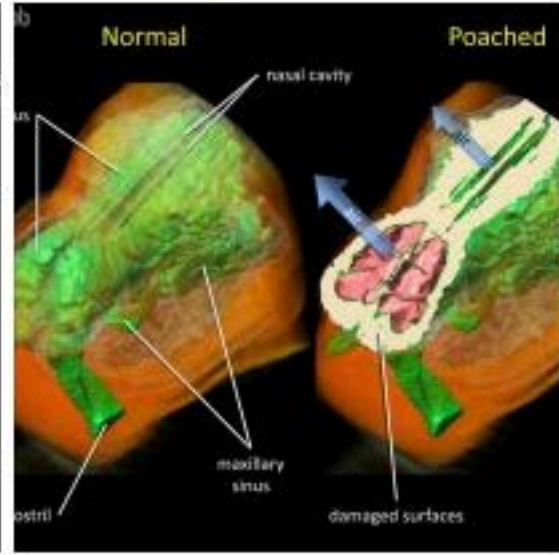
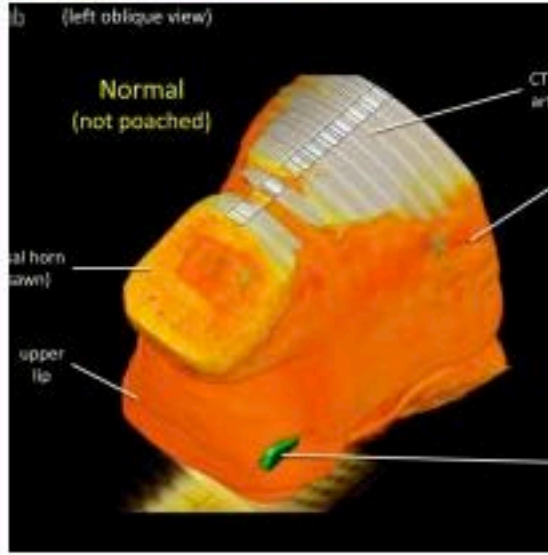
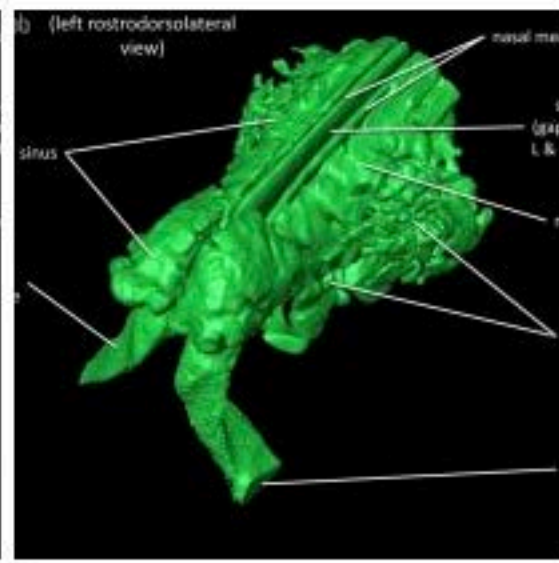
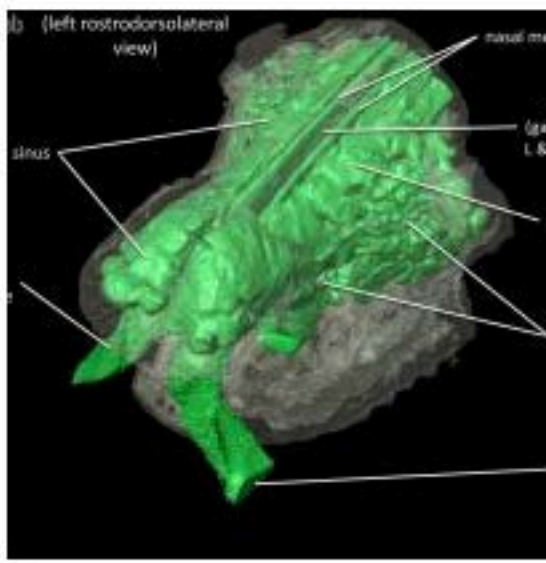
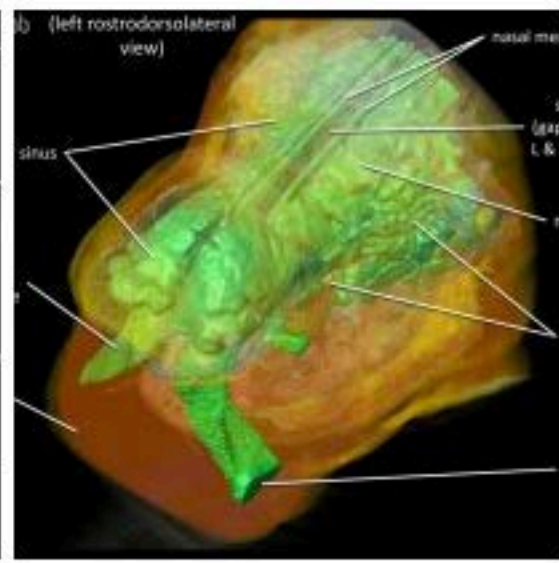
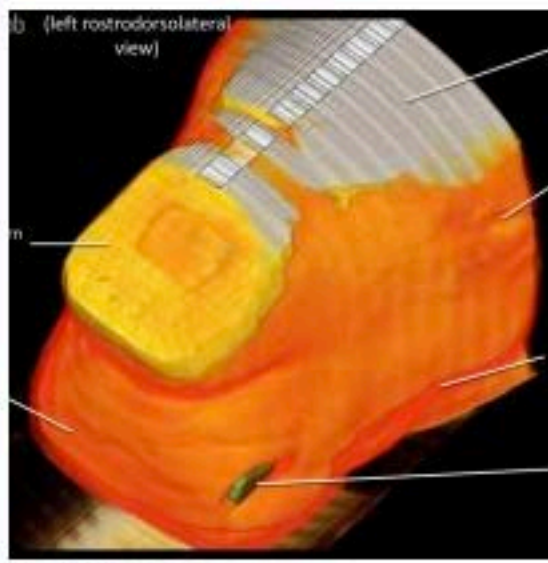
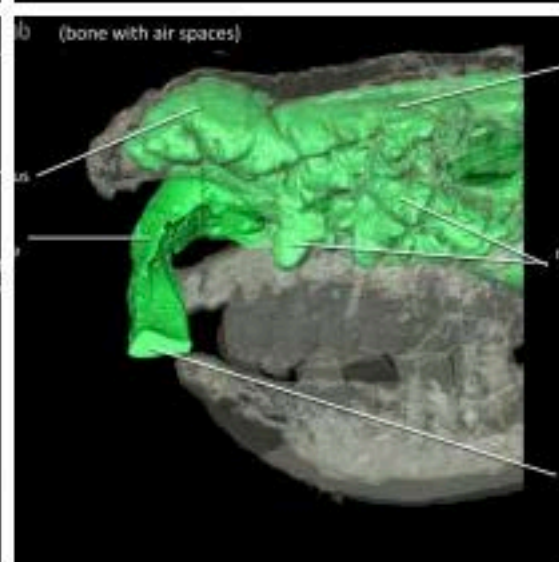
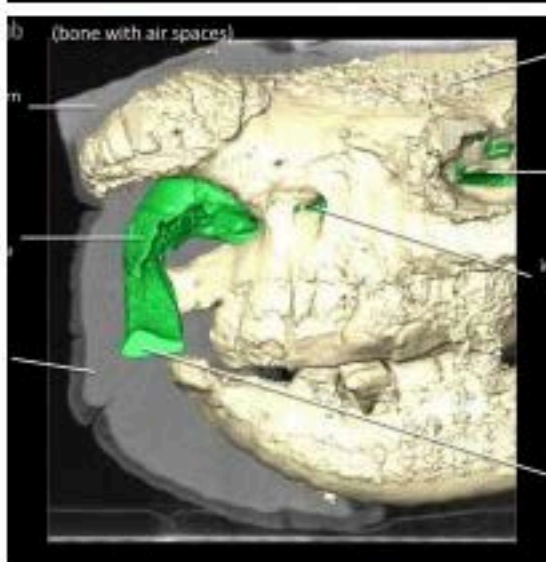
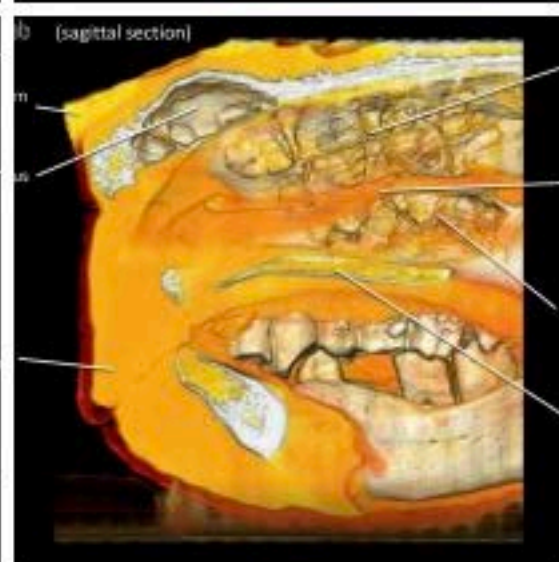
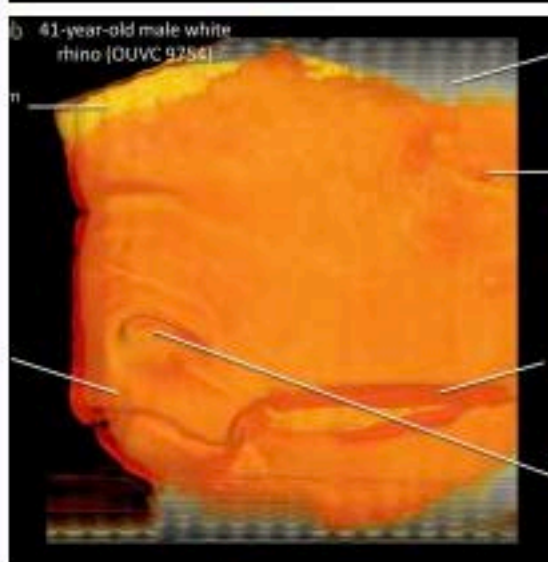
nasal meatus
nostril

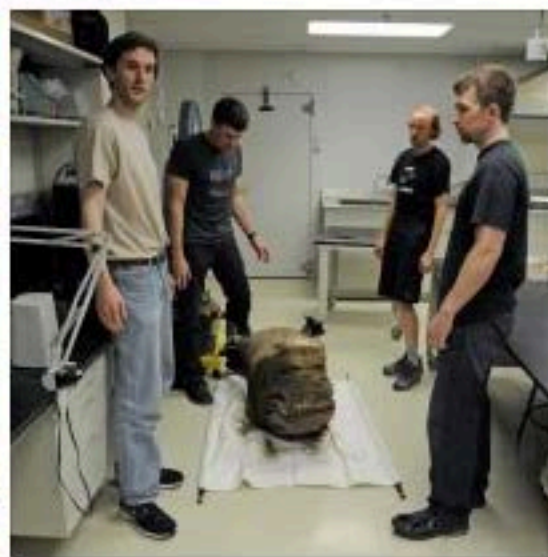
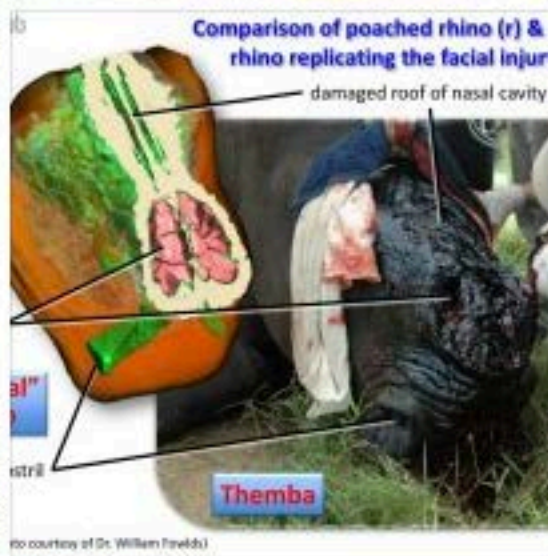
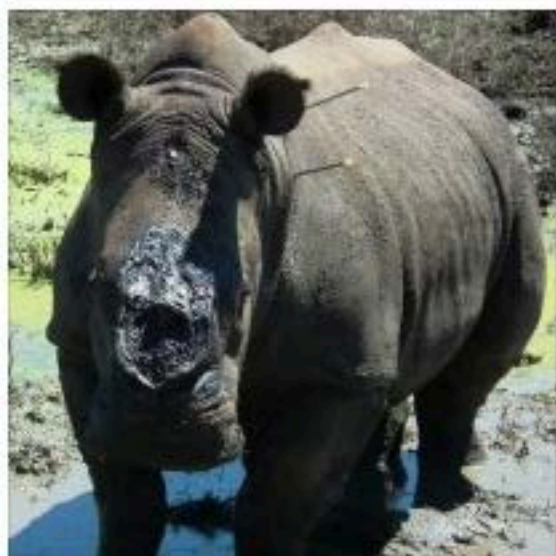
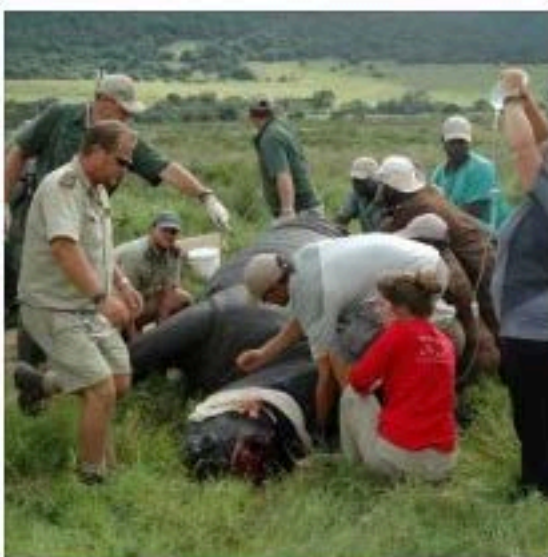
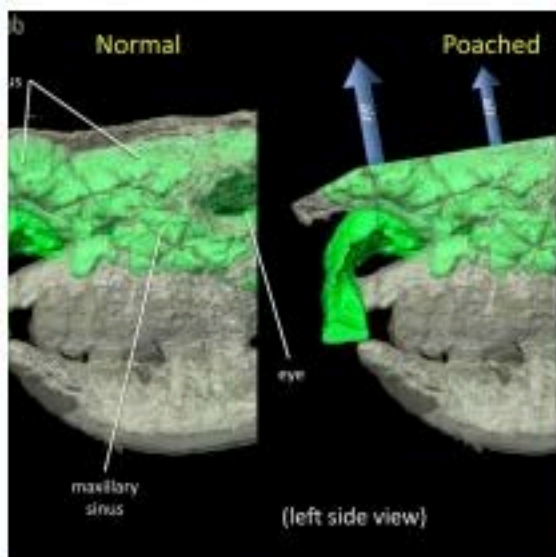


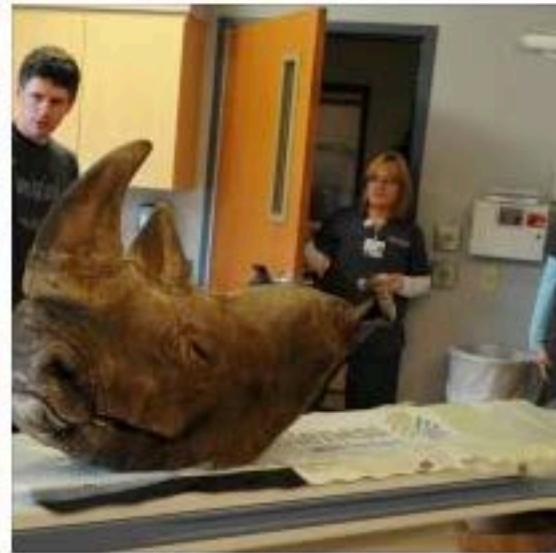
nasal meatus
nostril

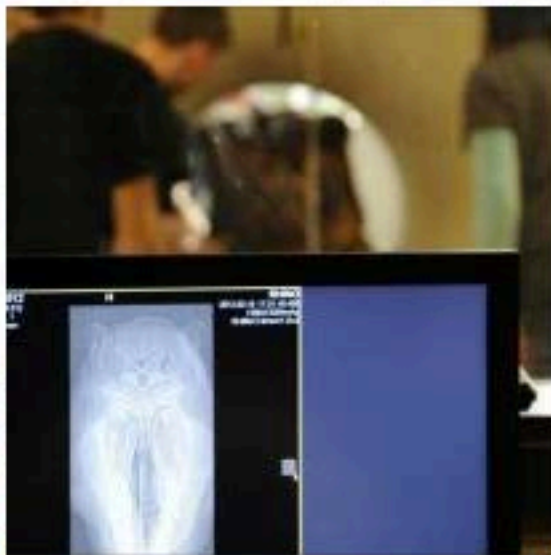
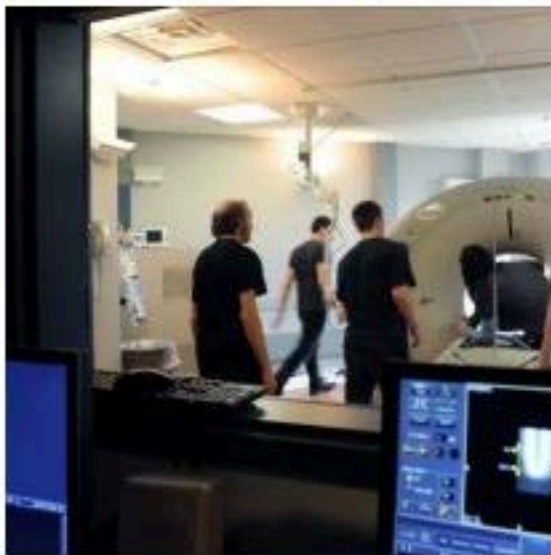
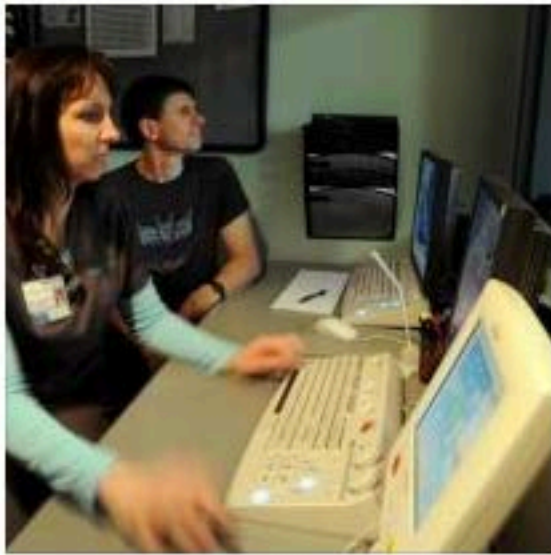


nasal meatus
nostril









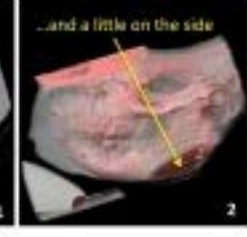
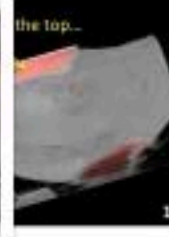
Digital assembly of a complete CT dataset of Kehla

Kehla was simply too big to scan in one go. We had to assemble three datasets. This next sequence shows Ryan Ridgely did the assembly.



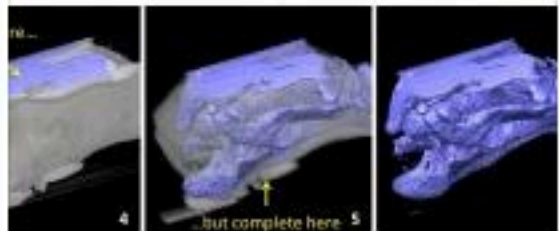
the lower part of the head

CT scanners have a circular field of view (FOV). Images of large objects like a rhino "cut off" around the periphery. We solve this problem by positioning the head region of interest is closer to the scanner's opening. Here we image the top of the head, cutting off the top and the sides. We also cut off the ears so they wouldn't fit!

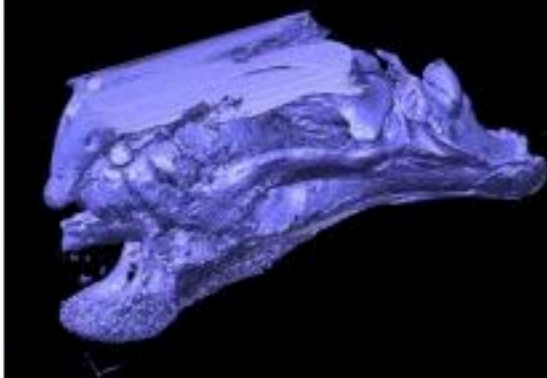


the upper part of the head

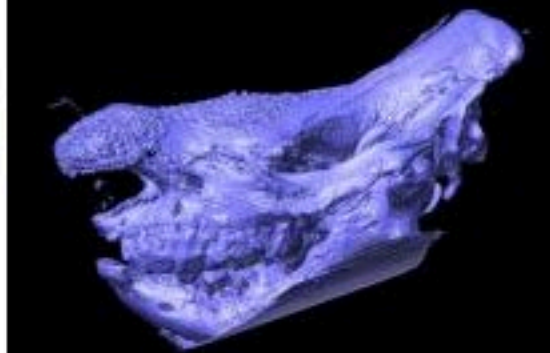
the head upside down brings the upper head closer to the center of the field of view, although cutting off the top of the head. In retrospect, it was that our previous studies of rhino horns led us to remove Kahlia's horns. We'd never have been able to image the head.



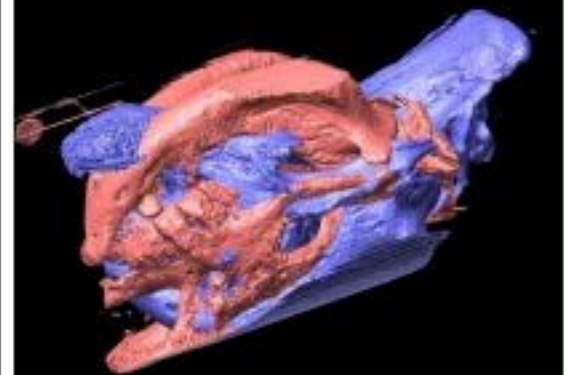
most of this series is intended to be run almost like a movie, so use your mouse and arrow to move forward, left to move back (duh!).



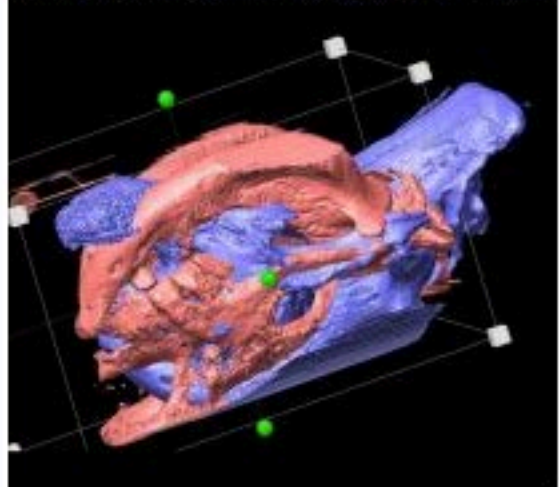
the skull is flipped, so that we wind up with the head right-side up.



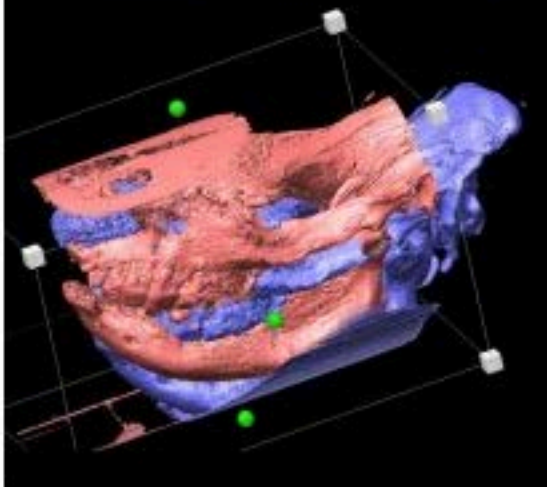
add in the other dataset... which was originally scanned right-side up. I added it here to remind you that the two datasets were offset 180 degrees. Still with me?



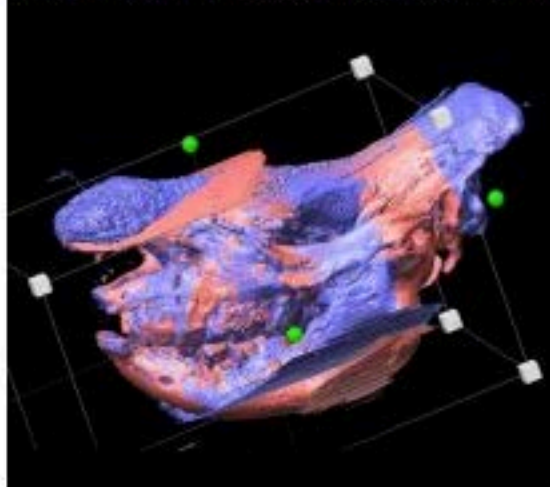
software we're using is called Avizo. Here we invoke the Transformation tool, which allows us to align these different datasets.



the "upside down" head, which has a better lower part, is then flipped to start the



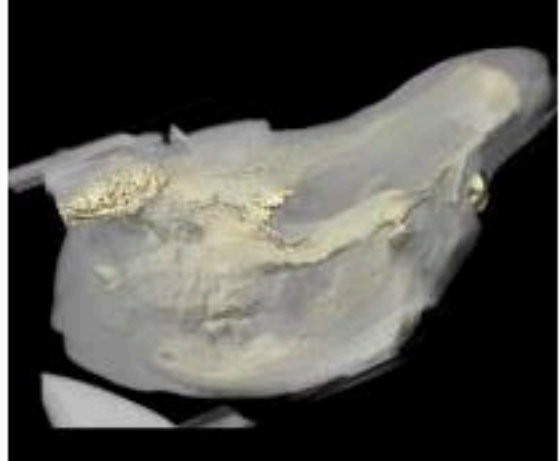
are then aligns the two datasets, which combines the best of both datasets as well as the worst, meaning the cut-off artifacts needs to be removed.



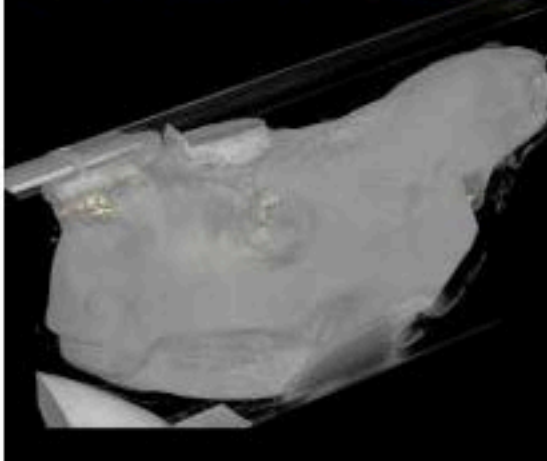
but we're not done yet. We're not just interested in the skull... we want the head put together, meaning all the soft-tissues—including the horns.



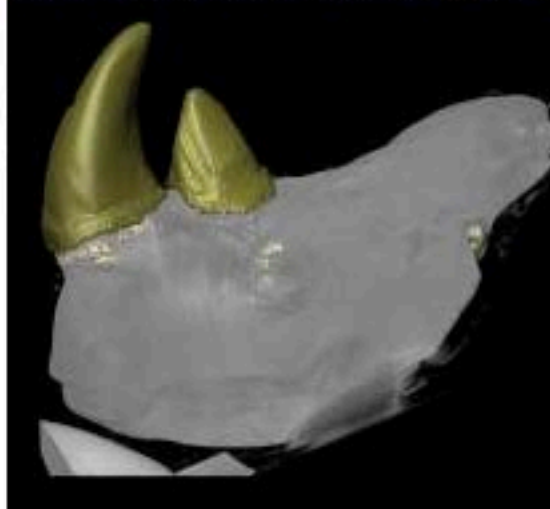
to get the horns that we removed in around 2005, we need the whole head. The reassembled head, showing the bases of the horns. The plate-like structure that sits on the nasal horn base is part of the scanner's table... remember, we got the top part of the head by scanning it upside down.



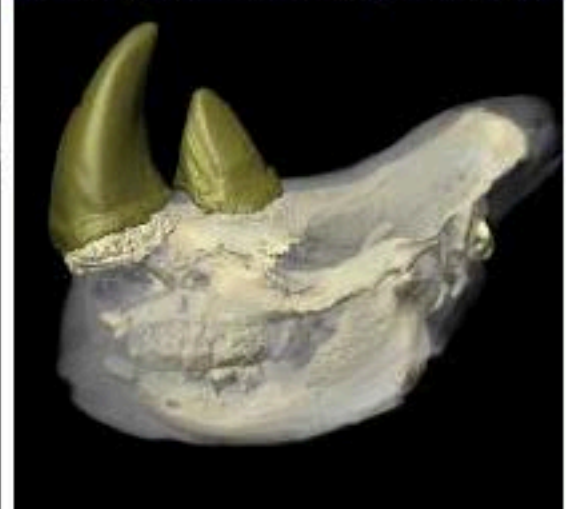
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the horns are now attached. Ryan even sealed up the kerf (the saw-cut



...to seal! Now that the head is assembled, we can really get to work on the



Okay...one more bonus image.

