Unit 10 GeoMation: Widening and Narrowing

I was out at the Grand Canyon a few years ago. And I was standing behind the fence there. And I was talking to a very nice and knowledgeable ranger about the history of mining at the place. And we were looking at those incomparable cliffs. And there's sort of a cliff of limestone, and a slope of shale, and a cliff of sandstone on another slope, and so on, on down to the river sitting way down below someplace like that.

And while we were standing there talking, this gentleman walked up, and he asked us why the river had gotten narrower. And we gave him a confused look. And he said, well, the river down there is very narrow. But if you try to look all the way across to the North Rim which is way the heck over there, what you see is, in fact, that the top is very broad. So he sort of figured that the river had been wide, and then it had gotten narrow.

Now, right beyond the fence there was a bit of a crack down into the cliff-forming rock there. And I ask him whether he would have any interest in going out beyond that crack and taking a jackhammer and starting to work on it. And he offered the opinion that eventually it would break off. And that when it broke off, that he would end up somewhere down the slope with a big rock on top of him, and that that would not be a good thing to do.

Well, then I ask him if he looked across the canyon, did he see places where a lot of rocks had piled up that looked like they had fallen off of the cliff. And he said, well, yeah I do. And that one fell. And this was a bright person. He immediately got it. He says, oh, what happens then is that the river must cut down. And once the river has cut down some, then, this slow process of mass wasting is going to widen it.

And in particular what happens is that the shales, the slope-formers cut down. And that makes the cliffs higher. And if the cliffs get really high, they tend to fail, and blocks fall off. And so that after a while you look at it, and you find that the canyon sort of has the same shape that it used to. But it's gotten wider as well as getting deeper as the river comes down.