Hazen and his team avoid taking the evolutionary analogy further, although the ingredients are there! When claiming mineral species do not change over time, he is only telling half of the story. There are minerals known as *structural polymorphs,* an example of which is the andalusite-silimanite series.[8] Although there are several different minerals in this series, they are all formed from the same three chemical elements: Al, Si and O in the empirical formula Al_2SiO_5. Temperature and pressure control the structural layout of these chemical elements thus determining the mineral species: distene or kyanite ($Al_2[SiO_4]O$), andalusite ($Al_2[SiO_4]O$) and sillimanite ($Al[AlSiO_5]$) (figure 1). This should have been proudly added by Hazen to his evolutionary analogies as a case of *homology*.

Hazen is actually wrong when affirming that mineral species don't change: minerals actually do change over time if they are exposed to different physical and chemical conditions. Muscovite—a mica—($K_2Al_4[Al_2Si_6](OH, F)_4$) in the presence of CO_2-rich water loses K and F and transforms into kaolinite ($Al_4[SiO_{10}](OH)_8$). Darwin initially called this idea 'transformism'. But by adding oxygen to an existing mineral and forming a new mineral, what actually changes? One mineral into another! In a process known as 'dolomitization', the addition of magnesium to calcite ($CaCO_3$) changes it into dolomite ($CaMg(CO_3)_2$). According to Hazen's evolutionary analogy, this should be defined as *mineral evolution* by *mutation*; it also exhibits *natural selection* since the minerals have 'adapted' to new chemical conditions!

How could Hazen miss this? Maybe he didn't and just skillfully avoided taking the analogy too far for it should be obvious that this is not what Darwin meant by 'evolution'! Darwinian evolution proceeds by mutations from within and not by adding pre-existing information from outside! Darwin's diversification of taxa is explained by the repeated splitting of one taxon into two or more taxa, not by merging two or more taxa into one. By leaving things at the shallowest level possible, Hazen & Co. hope to blaze the trail toward integration into either 'geobiology' or 'biogeology'!

Is this a new challenge to young-earth creation models?

Not really. If there is a challenge, it's mostly a methodological one. 'Integration' seems to be the battle cry of the evolutionary establishment but the shallowness of this new idea provides excellent grounds for creationists to dismantle it and by consequence further expose the fallacies of Darwinian evolution. As for the deeper meaning of all this, we have yet another proof of God's integrated creation, all parts of it working together, from minerals to humans: 'For the invisible things of Him from the creation of the world are clearly seen, being understood by the things that are made…' (Romans 1:20).

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Panderichthys—a fish with fingers?

Shaun Doyle

Once more, fish-to-tetrapod evolution is *paraded around*,[1–2] this time with a study suggesting the replacement of *Tiktaalik*, the icon of fish–tetrapod evolution, with the 90–130-cm-long *Panderichthys rhombolepis*. However, *Panderichthys* isn't exactly new; it was actually named in 1941.[3] And it's supposedly older too: 385 million years (Ma) old in comparison to *Tiktaalik*, which is supposedly 380 Ma old. However, a recent study has suggested that *Panderichthys*' fin may be *closer* to tetrapods in morphology than *Tiktaalik,*[4] although evolutionary theory would predict that tetrapod characteristics would be more recent.

Fishing for fingers

Boisvert *et al.* have based their analysis on the pectoral fin of one particular *Panderichthys* fossil, which they reconstructed from a CT scan study of the fossil, which they then used to reconstruct a 3D image of the fossil fin. *Panderichthys* was found to have multiple 'digits' at the end of the bony part of the pectoral fin similar to *Tiktaalik's*, which Boisvert *et al.* made out to be homologous with digits on tetrapod limbs (figure 1). Aside from the general biological[5] and theological[6] problems with excluding common design, *Panderichthys* is still unequivocally a *fish* with *fins*.

The small distal bones found between *Panderichthys* and *Tiktaalik* are nothing in comparison to the changes that need to be made between either of them and a limb, as one of the co-authors of the *Nature* paper, Per Ahlberg, has admitted before:

> 'Although these small distal bones bear some resemblance to tetrapod digits in terms of their function and range of movement, they

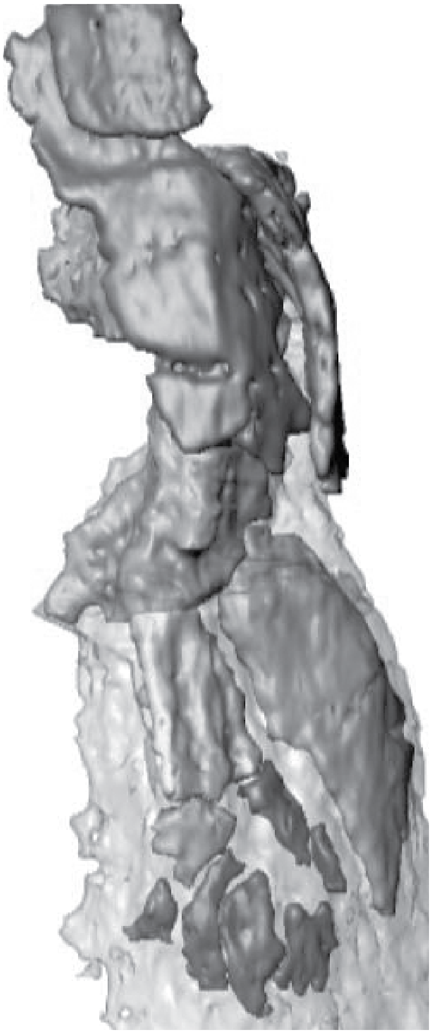

Image by Boisvert *et al.*, ref. 3, p. 1.

Figure 1. CT scans of *Panderichthys*' fin show that it has a fin structure like *Tiktaalik*.

> are still very much components of a fin. There remains a large morphological gap between them and digits as seen in, for example, *Acanthostega*: if the digits evolved from these distal bones, the process must have involved considerable developmental repatterning.'[7]

They do not claim that the digits themselves in *Panderichthys* are any more advanced than *Tiktaalik*; but they do claim that some of the features of the so-called 'wrist' and the positioning of the digits are more tetrapod-like. However, they also acknowledge that *Panderichthys* and *Tiktaalik* are close in pectoral fin morphology, exhibiting largely the same bones in comparable proportions. The problem is that neither of them are anything like a tetrapod limb because the wrist morphology is all wrong.[8]

As Luskin points out, there are a number of things that need to radically change from *Tiktaalik* to get a proper tetrapod wrist/hand:

1. 'Shrink *Tiktaalik*'s [and *Panderichthys*'] radius and reposition it so that it articulates other bones further down the limb.
2. 'Evolve a radiale [a third bone alongside the ulnare and intermedium that articulates with the radius].
3. 'Dramatically repattern, reposition, and transform the existing radials by lining them up, separating them out to form digits.
4. 'Evolve metacarpals and phalanges so that there are real digits extending distally from the radius.
5. 'Evolve the "lotsa blobs", i.e. evolve other carpal bones between the radius, ulna, and the now-aligned digits to form a real wrist. In other words, evolve the bulk of the wrist-bones.'[8]

Another important consideration is *function*. Since these particular fins have never been seen in live operation, there is no reason to suggest that they provide evidence for fish–tetrapod evolution. Coelacanth is a prime example. Before it was known that its limbs were used for deft manoeuvring of the fin, the coelacanth's limbs were thought to be evidence of the fish–tetrapod transition. Now we know better.[9] The situation is no different in *Panderichthys*.

The illusion of evolution

Boisvert *et al.* are rather confused as to how and where to place *Panderichthys* in the evolutionary series:

> 'It is difficult to say whether this character distribution implies that *Tiktaalik* is autapomorphic,[10] that *Panderichthys* and tetrapods are convergent,[11] or that *Panderichthys* is closer to tetrapods than *Tiktaalik*. At any rate, it demonstrates that the fish–tetrapod transition was accompanied by significant character incongruence in functionally important structures.'[4]

However, there are no lineages—merely the comparing of finished products to come up with the *illusion* of a lineage.

They don't know which of their smorgasboard of just-so evolutionary 'explanations' they should use, so they leave the reader with a few possible ones to give the illusion that evolution has it all worked out, even if we don't. However, there are no lineages—merely the comparing of finished products to come up with the *illusion* of a lineage. The story as Daeschler *et al.* described it remains true:

> 'Major elements of the tetrapod body plan originated as a succession of intermediate morphologies that evolved *mosaically* and *in parallel* among sarcopterygians closely related to tetrapods, allowing them to exploit diverse habitats in the Devonian [emphases added]'.[12]

The problem of mosaic and parallel evolution is that they occur to parts of organisms rather than the whole (mosaic) and that the same thing evolves more than once independently (parallel). Both of these are excuses that are used when common descent fails, and are extremely unlikely to happen.[9,13]

Conclusion

For all the complex 3D imaging that went into this paper, there really is not much in it. It further confirms that *Tiktaalik* is an unequivocal *fish*, related to *Panderichthys*, and it tells us that fish–tetrapod evolution *is a mess*. This is not a surprise from a biblical perspective, because evolution fails to explain the evidence, and these fish were created fully functional.

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Dancing dinosaurs?

Michael J. Oard

Geologists from the University of Utah recently announced finding a remarkable array of dinosaur footprints on the Arizona-Utah border in the USA (figure 1).[1] They described their find as ‘a dinosaur dance floor’ and said it was located alongside an oasis in a sandy desert 190 million years ago.

Dinosaur tracks in sedimentary rocks are no longer unusual. They are found all over the world,[2] especially in the Rocky Mountains and High Plains of the western United States. Millions of tracks are now known, some of them forming large areas with a huge amount of tracks. In some cases there are so many tracks that the strata are greatly mixed up or ‘dinoturbated’.

Circular impressions interpreted as dinosaur tracks

Once in a while a new find will have some unusual features. This new dinosaur track site, actually a new interpretation of an old site, displays a few unusual features. Pothole-like impressions in the Navajo Sandstone had previously been interpreted as weathering pits. But now it is believed the circular depressions were made by dinosaurs.[3] The impressions are located within the Navajo Sandstone of the Paria Plateau of the USA at the Utah/Arizona border.

The impressions, which range in size from 3 cm to 50 cm, do look like simple holes in the ground, but they have features that lend themselves to having been formed by walking vertebrates assumed to be dinosaurs. For instance, there are claw and toe impressions with rare tail drag marks (there are fewer than a dozen tail drag marks in the world). One of the most conclusive evidences is that the tracks line up to form straight trackways—practically all moving in a west-southwest direction. The holes are of the correct size and are concentrated on one bedding plane at about 12 impressions per square metre. There are probably a few thousand impressions all together. Because of the number of tracks, the authors referred to the surface as a ‘dinosaur dance floor’. The dinosaurs would thus be ‘dancing dinosaurs’, an obvious flight of imagination given the straight trackways. But the case is strong that the impressions are modified dinosaur tracks, although one anonymous review of the *Palaios* paper still believed that the holes are erosional features.[1]

Interesting dinosaur features

Besides the strongly preferred orientation and the rare tail drag marks, a few other features are worthy of note. It is claimed that there were four types of dinosaurs including carnivores and herbivores. It is interesting that such enemies traveled the same path at probably near the same time. Also, the small tracks are interpreted to be the tracks of babies, a most unusual discovery if the small impressions are really tracks, since tracks of babies are very rare.

Also of interest is the author’s contradictory interpretation. The

Photo by Roger Seiler, <www.unews.utah.edu>

Figure 1. University of Utah geologist Winston Seiler walks among hundreds of dinosaur footprints in a ‘trample surface’.