DONNYBROOK SANDSTONE

This building stone, as its name implies, is found in Donnybrook in the State's south-west. It is thought to have been formed in Early Cretaceous times (Neocomian, around 144-132 million years ago), but has been hard to date for certain, firstly, because no fossils which can be dated have been found in it, and secondly, because it rests on an old, eroded surface of ancient Precambrian rocks, so we have no clues to its age from rock layers immediately preceding it.

The reason that this sedimentary rock does not contain good fossils is not because it was too old a rock for them to be present, because in Cretaceous times this part of the world was full of life, and not because it was formed in the wrong environment, because it was deposited close to a shoreline where living creatures are normally abundant: they just haven't found any, as far as we know. All that are known are moulds of perhaps the inner parts of shells which are not distinctive enough to be able to date the rock in the normal way.

It could be that sedimentation was so rapid it wasn't a pleasant place for things to live, or because for some reason the parts of the animal weren't preserved long enough for it to become fossilised. Perhaps the calcium carbonate making up the shells dissolved away before they could be set into the rock. However, "trace" fossils have been found, including the tracks made by some kind of animal when it walked across a rippled beach.

You may be able to see some sedimentary structures like ripple marks, and bulbous, sometimes swirling, forms which show where layers of unstable wet sediment have slumped and bulged out into the layers above and below. Although the rock is mostly grains of quartz, they have been cemented together by clay minerals like kaolin (china clay), and there is some iron oxide present. The rock can range in colour from very pale to quite brown, as the amount of iron increases, and you can see how rusty lines have been built up where the iron-carrying solutions have soaked through the sediment and deposited waves of iron oxide. The brown stripes can look like sedimentary layering in some cases, but they are later and cut across the true sedimentary structures.

At the quarry, other features can be seen such as thin layers or fragments of a clay-rich sedimentary rock called shale within the sandstone succession. These are brownish-red or grey, depending on the state of the iron minerals which are responsible for the colour. Where the sandstone has broken naturally between the beds, you can see large rippled surfaces showing that the water it was laid down in was shallow. The thick beds of sandstone are usually broken into blocks by drilling lines of holes and using wedges to force them apart.

There are quite a few buildings in Perth made of this Donnybrook sandstone. Unlike the Tamala limestone, it isn't easily broken down by weathering, and yet it can be readily worked and carved. At one stage, in the 1930's, there were eight quarries in Donnybrook producing stone. Later, these all closed, but in 1981 the Goldfields Quarry to the south of the town was re-opened and has since produced floor tiles and facing slabs.