ETTY STREET CUTTINGS

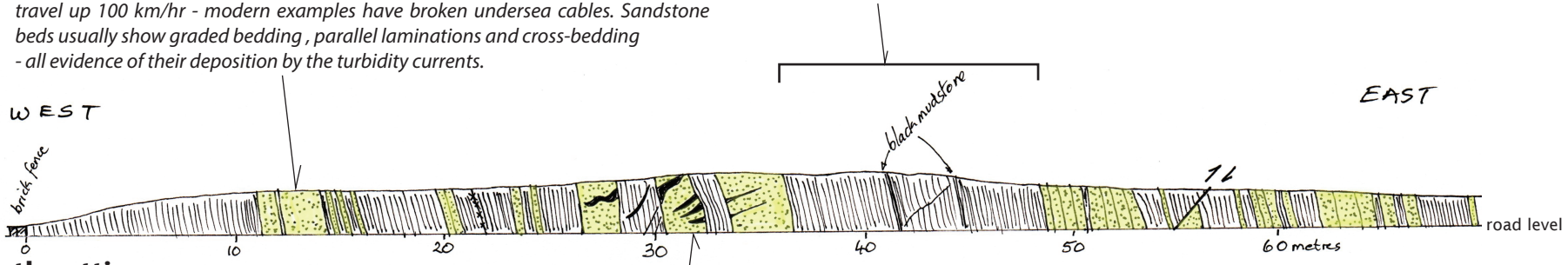
The sedimentary layers that form the bedrock of Castlemaine were all deposited as horizontal layers (or beds) on a deep ocean floor between 460 and 485 million years ago during the time known as the Ordovician Period. At this time the whole of eastern Australia was seafloor located east of the Gondwana coastline, which was near a line joining Mildura and Portland. There was no significant life on land at the beginning of this period although arthropods and some plants began to colonisze land during the Ordovician. However life was abundant in the oceans and marine fossils of nautilods, bivalve shellfish and graptolites have all been found at Castlemaine.

Sandstone

Sandstone layers are called turbidites. The turbidites formed after sand, silt and clay accumulated in shallow waters near the Gondwana coastline. Every so often the sand mixture slumped down into deeper water, caused either by the instabilty of its own weight, or by regular earthquakes. These high energy 'turbidity currents' can travel up 100 km/hr - modern examples have broken undersea cables. Sandstone beds usually show graded bedding , parallel laminations and cross-bedding - all evidence of their deposition by the turbidity currents.

Mudstone

Thick mudstone sections are largely formed by the gentle deposition of clays that drift down from upper parts of the ocean, or from the low-energy parts of turbidity currents. They often include thin layers of black mudstone that have a high carbon content and contain fossils such as Graptolites.



Etty St - North cutting

Quartz Veins

Quartz veins formed after the sedimentary layers were raised and upturned above sea-level about 445 million years ago. Hot watery fluids (300 - 350° C) containing silica, gold and other minerals were formed deep in the Earth's crust. The fluids were highly pressurised and were able to force their way into faults and fractures where they precipitated silica as gold-bearing quartz veins. Individual quartz veins were formed by repetitive cycles of vein opening, precipitation of quartz and gold and then sealing of the vein as fluid pressure temporarily dropped.

Why are layers tilted

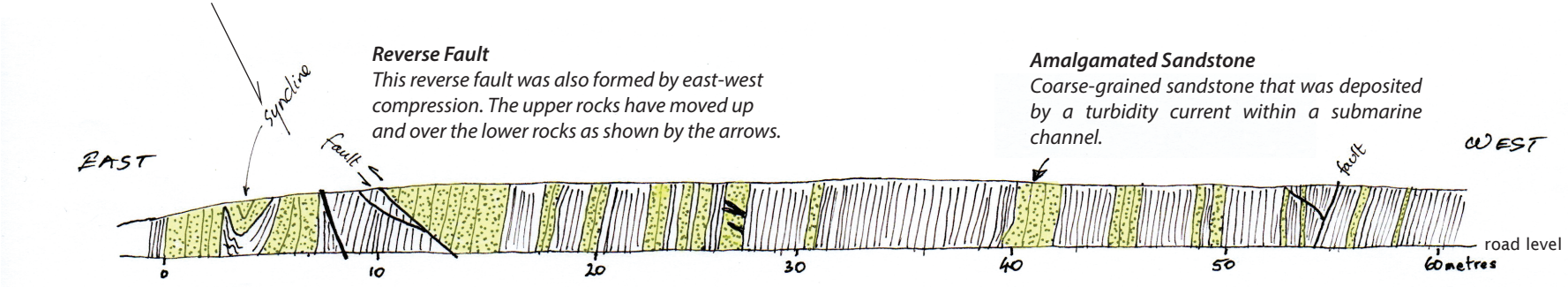
The rock layers were folded and tilted by east-west compression caused by the movement of tectonic plates. There is a small syncline in the east end of the cutting. A syncline is a U or V-shaped bend in the sedimentary layers. This is the opposite to an anticline which is an A-shape fold.

Reverse Fault

This reverse fault was also formed by east-west compression. The upper rocks have moved up and over the lower rocks as shown by the arrows.

Amalgamated Sandstone

Coarse-grained sandstone that was deposited by a turbidity current within a submarine channel.



Etty St - South cutting

C.E. Willman June 2024