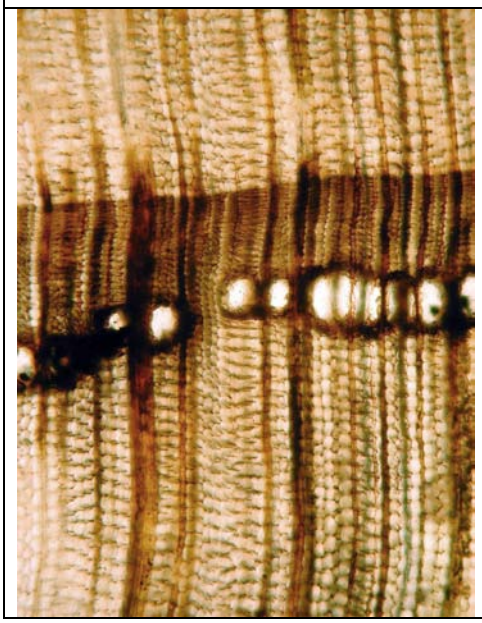
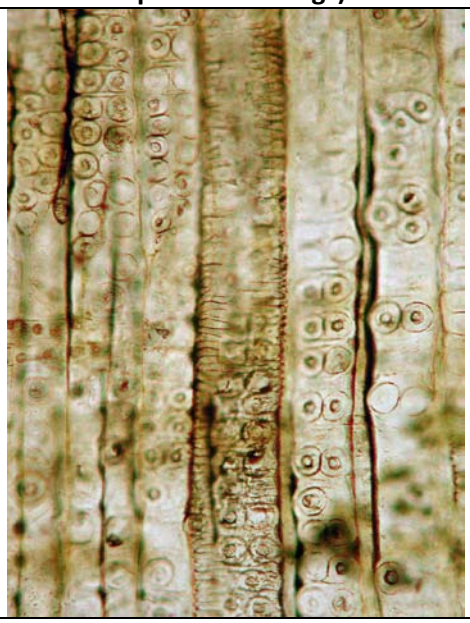
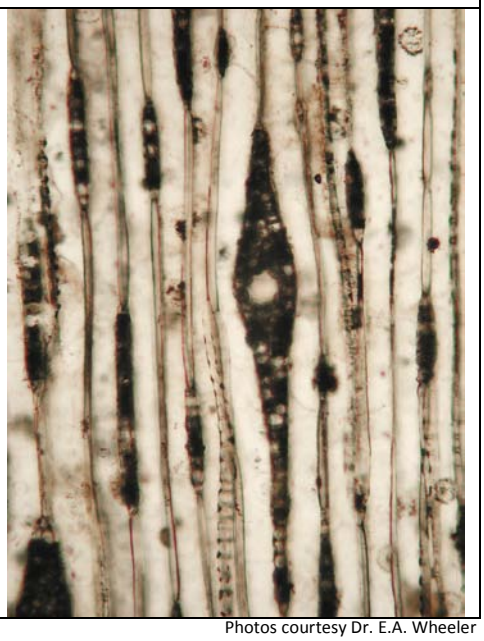
Pseudotsuga pseudotsugae **(Douglas fir, red fir)**

Family: Pinaceae

Synonym: *Piceoxylon pseudotsugae* Gothan

Naming reference: Beck, G.F. 1945. Tertiary coniferous woods of western North America (Part 2). Northwest Science, XIX, 89-102.

Other reference: Wheeler, E.A. & T.A. Dillhoff. 2009. The Middle Miocene wood flora of Vantage, Washington, USA. IAWA Journal, Supplement 7. 101p.

Transverse section (showing tangential group of resin canals)	Radial section (showing intertracheary pits and tracheid with spiral thickenings)	Tangential section (showing fusiform ray with resin canal)
		

Photos courtesy Dr. E.A. Wheeler

Diagnostic features: Growth rings distinct, abrupt transition from earlywood to latewood. Both axial and radial resin canals are present, surrounded by thick walled epithelial cells. Axial resin canals typically at latewood/earlywood transition or in latewood portion of growth ring, often in tangential groups. Radial resin canals occur in multiseriate fusiform rays. Other rays typically uniseriate. In radial section, rays can be seen to have marginal rows of ray tracheids. Spiral thickenings present in longitudinal and ray tracheids.

Discussion: Beck (1945) lists this type as being abundant at Vantage and common in several other wood floras. Under a hand lens, it can look very similar to *Picea* (spruce). In his publications, Beck typically referred to wood of the undifferentiated spruce/Douglas fir type as *Piceoxylon.* In cross section view, *Pseudotsuga* usually has a more abrupt transition from earlywood to latewood. There is some overlap in features though, so any hand lens identifications should be taken with a grain of salt. In thin section, *Pseudotsuga* has spiral thickenings in axial and ray tracheids that clearly distinguish it from *Picea*.

Fossil *Pseudotsuga* wood is known from the Eocene of the high Arctic, and there are published reports of fossil seeds, cones and foliage from the Pacific Northwest, although some of these identifications need to be reevaluated. Modern *Pseudotsuga* is restricted to eastern Asia and western North America – it is one of the dominant trees in coniferous forests of the Pacific Northwest and is valued for its timber.