Abstract: Petrified wood is well-known both as a material for lapidary arts, and as an important source of information for understanding the history of plant life. The taxonomic and paleoenvironmental aspects of fossil woods have been subject to intensive investigation. In contrast, geologic origin of petrified wood has received less study. How much time is required for wood to become fossilized? What minerals are present? How did they originate? What is the origin of petrified wood color? These seemingly simple questions have surprisingly complex answers. New evidence suggests that some traditional assumptions lack validity. In particular, wood petrifaction has long been described as a process of permineralization, where cellular tissue becomes entombed when silica is precipitated in open spaces. This hypothesis been widely accepted, despite a paucity of supporting data. Recent investigations show that silicified woods typically contain only very small amounts of relict organic matter, evidence that true permineralization rarely occurs. Much new evidence for wood fossilization processes comes from Canadian localities, particularly the Cenozoic mummified forests that occur in the Arctic region, and the Cretaceous calcium-carbonate mineralized woods preserved in abundance on Vancouver Island.