

## *Thuja (Thuites) from the Latah Formation of Idaho*

NORMAN J. GILLETTE

*Department of Plant Sciences, Syracuse University  
Syracuse, New York*

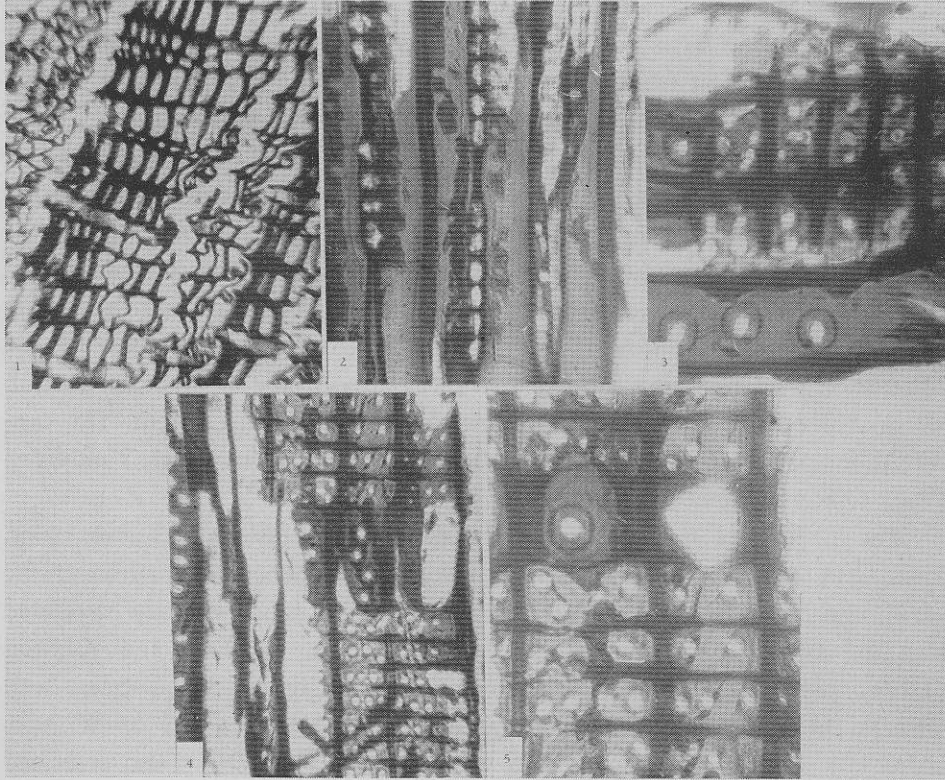
ONE OF THE earlier studies of the Miocene floras of the Northwest was that of Knowlton (1926), which accompanied a geological study of the Spokane region by Pardee and Bryan (1926). The latter authors proposed the name *Latah formation* "for a series of beds, consisting mostly of clay and shale and of fresh-water origin that are found near Spokane, Washington, and that contain an abundant middle or lower Miocene flora." These rocks are often overlaid by basalt flows also assumed to be of Miocene age. Subsequent studies on fossiliferous rocks in north-central Idaho and adjacent Washington greatly extended the range of the Latah sediments beyond the originally defined area. The flora reconstructed from these beds include genera known from mesophytic forests of temperate regions of today, and the species comprising it are often separated into three groups on the basis of the distribution of their living equivalents: an eastern Asiatic element, an eastern North American element, and a western North American element. The coniferous genera include *Glyptostrobus*, *Juniperus*, *Libocedrus*, *Pinus*, *Taxodium*, *Thuja (Thuites)*, and *Torreya*.

The majority of the fossil remains consist of impressions of leaves, twigs, fruits, and seeds collected from the volcanic ash deposits constituting the Latah, and few specimens of fossil wood have been found directly associated with the ash or with the Columbia River basalts. Kirkham and Johnson (1929) reported much coniferous charcoal and lignitic wood from well cuttings through the Columbia River basalts at Moscow, and at Weippe, Idaho, but no generic determinations were made. Beck (1935) also described some petrified wood from the Yakima basalts.

The fossilized wood here described was collected from a road cut between Juliaetta and Arrow Junction in Idaho along Potlatch Creek, a tributary of the Clearwater River. At one edge of the beds of volcanic ash was an exposure of basalt containing several logs of various sizes. The wood was in a charred condition, and that lying along the highway looked no different from some that might have been partially burned only recently. The wood was so brittle that it crumbled when attempts were made to section it. It

was therefore infiltrated with paraffin and imbedded. The imbedded wood was then soaked for about two days in a synthetic detergent, after which it was possible to cut sections as thin as ten microns with a rotary microtome.

As seen in transverse section (Fig. 1) the summer wood cells appear well preserved, but there is great crushing of the spring wood. The average tangential diameter of the tracheids is 33 microns. No longitudinal parenchyma cells or resin ducts are evident in any of the transverse sections observed.



Tangential sections (Fig. 2) show only uniseriate rays that are relatively low. In the radial cuts (Fig. 3) the bordered pits of the tracheids are well preserved and for the most part are uniseriate. No ray tracheids were observed (Fig. 4), and the taxodioid pits (Fig. 5) between the ray cells and the longitudinal tracheids are in a single row with two or three per ray-crossing. The vertical end walls of the ray cells lack the nodules and deep pits that serve to differentiate the present-day species of *Thuja* from *Abies* and others. The taxodioid pits separate *Thuja* from the other living members of the

Cupressaceae. No rays were observed that approached the ray height of either *Sequoia* or *Taxodium*, and the texture is finer than that of either of these two genera.

Beck (1945) pictured a specimen he called *Thuioxylon* from the Miocene deposits at Thorp, Washington. Although no statement is made regarding the living equivalent of *Thuioxylon*, it is assumed from the name that an affiliation with *Thuja* is implied. The wood described here lacks the longitudinal parenchyma that is so prominent in the wood pictured by Beck, but according to Brown and Panshin (1940) the distribution of wood parenchyma is extremely variable in the two species of *Thuja* native to the United States, and in some specimens from this genus parenchyma may appear to be lacking.

Foliage remains of *Thuja (Thuites)* have been reported from various Miocene deposits of the northwest including fragmentary ones from the Latah at Spokane (La Motte, 1952). The wood identified here extends the geographic range of *Thuja (Thuites)* about 100 miles southeastward from Spokane.

#### *Literature Cited*

- Beck, George F. 1935. Fossil bearing basalts (more particularly the Yakima basalts of central Washington). *Northwest Science*, 9(4): 4-7.
- . 1945. Tertiary coniferous woods of western North America. *Northwest Science*, 19(4): 89-102.
- Brown, H. P., and A. J. Panshin. 1940. *Commercial timbers of the United States*. McGraw-Hill, New York. xxi + 554 pp.
- Kirkham, Virgil R. D., and M. Melville Johnson. 1929. The Latah formation in Idaho. *Jour. Geol.*, 37: 483-504.
- Knowlton, F. H. 1926. Flora of the Latah formation of Spokane, Washington, and Coeur d'Alene, Idaho. U.S. Geol. Surv., Prof. Paper 140: 17-80.
- La Motte, Robert S. 1952. Catalogue of the Cenozoic plants of North America through 1950. *Geol. Soc. America Memoir* 51. 381 pp.
- Pardee, J. T., and Kirk Bryan. 1926. Geology of the Latah formation in relation to the lavas of the Columbia Plateau near Spokane, Washington. U.S. Geol. Surv., Prof. Paper 140: 1-16.

Received October 13, 1952