

## **Microbially Altered Diabase from the Northern Caroline Plate(?)**

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Rock samples collected using the Wood Hole Oceanographic Institution's hybrid-remotely operated vehicle Nereus in 2009 from deep (10,879 m) on the incoming plate south of the Challenger Deep in the Mariana Trench may have originated at the Caroline Ridge. Optical microscopy, electron microprobe and Raman analysis show that they are partially altered massive diabase with altered interstitial glass and containing microtubules in vug-filling secondary phases. The tubules are similar to those observed in a variety of marine settings in lavas, hypabyssal igneous rocks and are presumed to have formed by tunneling lithoautotrophic microbes. The rocks were collected from the base of a fault scarp where large, columnar-jointed blocks are draped with sediment. A similar rock was dredged by V. Kanajev aboard the Soviet oceanographic vessel "Vityaz" in the late 1950's. There is the suggestion of a boundary between the Pacific Plate and the shallower sea floor (Caroline plate?) subducting beneath the southernmost Mariana Trench. Some interpret that the chain of seamounts striking NNW, colinear with the Lyra Trough, mark such a boundary. Sediments, drilled from above postulated basement north of the Caroline Ridge are no older than Oligocene. The igneous basement of the subducting plate south of the Challenger Deep is, as yet, undated, but it may be younger than the Jurassic Pacific Plate subducting further east. Age dating (underway) of the diabase recovered with Nereus should help to solve this question.