Abstract
Detailed mapping reveals that a major shallow-water boundary (sequence surface) exists within the shallow marine strata of the Ripogenus Formation near the Ripogenus Dam in northern Maine. An outcrop with an overlying sequence boundary is immediately above the limestone breccia. The thickness of the breccia, and the fact that it is overlain by silts and mudrocks showing evidence of an event of coeval rapid subsidence. Mafic volcanics (West Branch) succeed the limestone breccia, and are typically cobble-sized. The matrix is a more shaly or mudrock material in some places, and weathering fine-grained arenaceous matrix (both quartz and carbonate) occurs between typically very thin limestone beds. Angular limestone clasts in the breccia, and in fractures which penetrate the bedded limestone below, imply that more rapid subsidence began in association with this event. A previously reported conodont-based age of late Llandovery to early Wenlock, based on brachiopod faunas from strata equivalent to the older Pitted Sandstone, was confirmed by us. Our recent mapping (see Map - Fig 1, and Stratigraphy - Fig 2) reveals that there is evidence of a significant erosion surface (sequence boundary) within this unit, marked by the overlying orthoquartzite which is a basal member of a conformable stratigraphic succession, and dated by syn-depositional normal faulting of the Ripogenus Formation. A section of 100 meters of upper Llandovery rocks and interbedded quartzites-pyrite limestones (probable conodonts), which overlies the limestone breccia, gives evidence of an event of coeval rapid subsidence. Mafic volcanics (West Branch) succeed the limestone breccia, and are typically cobble-sized. The matrix is a more shaly or mudrock material in some places, and weathering fine-grained arenaceous matrix (both quartz and carbonate) occurs between typically very thin limestone beds. Angular limestone clasts in the breccia, and in fractures which penetrate the bedded limestone below, imply that more rapid subsidence began in association with this event. A previously reported conodont-based age of late Llandovery to early Wenlock, based on brachiopod faunas from strata equivalent to the older Pitted Sandstone, was confirmed by us.

Fig. 1. Geological Map of the Ripogenus Dam area, Maine

Stratigraphy
Erosion Surface and Quartzite
Previously, the Massachusetts Geological Survey, during strata mapping of the Cheooneck supereclipse, had combined one cross stratigraphic unit, the Ripogenus Formation. Our recent mapping (see Map - Fig 1, and Stratigraphy - Fig 2) reveals that there is evidence of a significant erosion surface (sequence boundary) within this unit, marked by the overlying orthoquartzite which is a basal member of a conformable stratigraphic succession, and dated by syn-depositional normal faulting of the Ripogenus Formation. A section of 100 meters of upper Llandovery rocks and interbedded quartzites-pyrite limestones (probable conodonts), which overlies the limestone breccia, gives evidence of an event of coeval rapid subsidence. Mafic volcanics (West Branch) succeed the limestone breccia, and are typically cobble-sized. The matrix is a more shaly or mudrock material in some places, and weathering fine-grained arenaceous matrix (both quartz and carbonate) occurs between typically very thin limestone beds. Angular limestone clasts in the breccia, and in fractures which penetrate the bedded limestone below, imply that more rapid subsidence began in association with this event. A previously reported conodont-based age of late Llandovery to early Wenlock, based on brachiopod faunas from strata equivalent to the older Pitted Sandstone, was confirmed by us.

Ripogenus Dam - age, sequence stratigraphy, and significance of syn-depositional tectonism

Outcrop of orthoquartzite in the thickest part of the valley. Bedded limestone breccia at the top of the Orthoquartzite Member. Thickness of the breccia, and the fact that it is overlain by silts and mudrocks showing no shallow-water features, implies that more rapid subsidence began in association with this event.

Fig. 2. Stratigraphic Column of the Ripogenus Formation

Bedrock volcanics and silts show a significant thickness of pyroclastic debris.

Fig. 4. Tectonic interpretation

- Faulted forebulge (elevation of lower Ripogenus pitted sandstones) - filling of eroded valleys by felsic arenites (quartzite)

Fig. 3. Cross-sections of the Ripogenus Formation

- angular unconformity on dry, Wayne, House Fire Unit

Fig. 5. Angular Unconformity on Dry, Wayne, House Fire Unit

Fig. 6. Section through orthoquartzite Member of the Ripogenus Formation

Acknowledgements
Workshop Maine and New England field guides in the past which were possible, especially for the rippling conodonts and syn-depositional arenites: Workshops for Field Work on the Castle Mountain and Balsam Lake Area, New Brunswick, Canada.

References

BRADLEY et al. (1969), based on brachiopod faunas from strata equivalent to the older Pitted Sandstone, was confirmed by us.

Our recent mapping (see Map - Fig 1, and Stratigraphy - Fig 2) reveals that there is evidence of a significant erosion surface (sequence boundary) within this unit, marked by the overlying orthoquartzite which is a basal member of a conformable stratigraphic succession, and dated by syn-depositional normal faulting of the Ripogenus Formation. A section of 100 meters of upper Llandovery rocks and interbedded quartzites-pyrite limestones (probable conodonts), which overlies the limestone breccia, gives evidence of an event of coeval rapid subsidence. Mafic volcanics (West Branch) succeed the limestone breccia, and are typically cobble-sized. The matrix is a more shaly or mudrock material in some places, and weathering fine-grained arenaceous matrix (both quartz and carbonate) occurs between typically very thin limestone beds. Angular limestone clasts in the breccia, and in fractures which penetrate the bedded limestone below, imply that more rapid subsidence began in association with this event. A previously reported conodont-based age of late Llandovery to early Wenlock, based on brachiopod faunas from strata equivalent to the older Pitted Sandstone, was confirmed by us.

Our recent mapping (see Map - Fig 1, and Stratigraphy - Fig 2) reveals that there is evidence of a significant erosion surface (sequence boundary) within this unit, marked by the overlying orthoquartzite which is a basal member of a conformable stratigraphic succession, and dated by syn-depositional normal faulting of the Ripogenus Formation. A section of 100 meters of upper Llandovery rocks and interbedded quartzites-pyrite limestones (probable conodonts), which overlies the limestone breccia, gives evidence of an event of coeval rapid subsidence. Mafic volcanics (West Branch) succeed the limestone breccia, and are typically cobble-sized. The matrix is a more shaly or mudrock material in some places, and weathering fine-grained arenaceous matrix (both quartz and carbonate) occurs between typically very thin limestone beds. Angular limestone clasts in the breccia, and in fractures which penetrate the bedded limestone below, imply that more rapid subsidence began in association with this event. A previously reported conodont-based age of late Llandovery to early Wenlock, based on brachiopod faunas from strata equivalent to the older Pitted Sandstone, was confirmed by us.

Our recent mapping (see Map - Fig 1, and Stratigraphy - Fig 2) reveals that there is evidence of a significant erosion surface (sequence boundary) within this unit, marked by the overlying orthoquartzite which is a basal member of a conformable stratigraphic succession, and dated by syn-depositional normal faulting of the Ripogenus Formation. A section of 100 meters of upper Llandovery rocks and interbedded quartzites-pyrite limestones (probable conodonts), which overlies the limestone breccia, gives evidence of an event of coeval rapid subsidence. Mafic volcanics (West Branch) succeed the limestone breccia, and are typically cobble-sized. The matrix is a more shaly or mudrock material in some places, and weathering fine-grained arenaceous matrix (both quartz and carbonate) occurs between typically very thin limestone beds. Angular limestone clasts in the breccia, and in fractures which penetrate the bedded limestone below, imply that more rapid subsidence began in association with this event. A previously reported conodont-based age of late Llandovery to early Wenlock, based on brachiopod faunas from strata equivalent to the older Pitted Sandstone, was confirmed by us.

Our recent mapping (see Map - Fig 1, and Stratigraphy - Fig 2) reveals that there is evidence of a significant erosion surface (sequence boundary) within this unit, marked by the overlying orthoquartzite which is a basal member of a conformable stratigraphic succession, and dated by syn-depositional normal faulting of the Ripogenus Formation. A section of 100 meters of upper Llandovery rocks and interbedded quartzites-pyrite limestones (probable conodonts), which overlies the limestone breccia, gives evidence of an event of coeval rapid subsidence. Mafic volcanics (West Branch) succeed the limestone breccia, and are typically cobble-sized. The matrix is a more shaly or mudrock material in some places, and weathering fine-grained arenaceous matrix (both quartz and carbonate) occurs between typically very thin limestone beds. Angular limestone clasts in the breccia, and in fractures which penetrate the bedded limestone below, imply that more rapid subsidence began in association with this event. A previously reported conodont-based age of late Llandovery to early Wenlock, based on brachiopod faunas from strata equivalent to the older Pitted Sandstone, was confirmed by us.

Our recent mapping (see Map - Fig 1, and Stratigraphy - Fig 2) reveals that there is evidence of a significant erosion surface (sequence boundary) within this unit, marked by the overlying orthoquartzite which is a basal member of a conformable stratigraphic succession, and dated by syn-depositional normal faulting of the Ripogenus Formation. A section of 100 meters of upper Llandovery rocks and interbedded quartzites-pyrite limestones (probable conodonts), which overlies the limestone breccia, gives evidence of an event of coeval rapid subsidence. Mafic volcanics (West Branch) succeed the limestone breccia, and are typically cobble-sized. The matrix is a more shaly or mudrock material in some places, and weathering fine-grained arenaceous matrix (both quartz and carbonate) occurs between typically very thin limestone beds. Angular limestone clasts in the breccia, and in fractures which penetrate the bedded limestone below, imply that more rapid subsidence began in association with this event. A previously reported conodont-based age of late Llandovery to early Wenlock, based on brachiopod faunas from strata equivalent to the older Pitted Sandstone, was confirmed by us.

Our recent mapping (see Map - Fig 1, and Stratigraphy - Fig 2) reveals that there is evidence of a significant erosion surface (sequence boundary) within this unit, marked by the overlying orthoquartzite which is a basal member of a conformable stratigraphic succession, and dated by syn-depositional normal faulting of the Ripogenus Formation. A section of 100 meters of upper Llandovery rocks and interbedded quartzites-pyrite limestones (probable conodonts), which overlies the limestone breccia, gives evidence of an event of coeval rapid subsidence. Mafic volcanics (West Branch) succeed the limestone breccia, and are typically cobble-sized. The matrix is a more shaly or mudrock material in some places, and weathering fine-grained arenaceous matrix (both quartz and carbonate) occurs between typically very thin limestone beds. Angular limestone clasts in the breccia, and in fractures which penetrate the bedded limestone below, imply that more rapid subsidence began in association with this event. A previously reported conodont-based age of late Llandovery to early Wenlock, based on brachiopod faunas from strata equivalent to the older Pitted Sandstone, was confirmed by us.