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THE CAMBRIAN-PRECAMBRIAN CONTACT IN NORTHWESTERN CONNECTICUT
AND WEST-CENTRAL MASSACHUSETTSRobert W. Schnabel¹, Charles W. Martin², and Robert M. Gates³

Introduction

Mapping in the West Granville, Tolland Center, Winsted, Torrington, West Torrington, Cornwall and South Canaan quadrangles shows that the contact between so-called Precambrian rocks to the west, and Cambrian rocks to the east is not sharp, clear cut and marked by a major fault or an unconformity. Rather, rocks with lithologies typical of Precambrian rocks exposed in the Berkshire and Housatonic massifs to the west, and rocks with lithologies typical of Cambrian lithologies to the east, are interlayered at many different scales throughout the area. This area is along the eastern flank of the Berkshire and Housatonic Highlands Massifs, along the border between Connecticut and Massachusetts (Figure 1).

Distribution of the geologic units as they have been mapped within the area are shown on figure 1 which is a much simplified version of our geologic maps.

Terminology of the formations within this area has undergone an extensive and anguished evolution. The gneisses have been called "Becket Gneiss", "Stamford Granite Gneiss", "Hinsdale Gneiss", "Washington Blue Quartz Gneiss", "Gneiss complex of the Berkshire Highlands", "Gneiss complex of the Housatonic Highlands", as well as other less formal names. Most often the schist units have been assigned to the Hoosac Schist in Massachusetts, and to the Warmaug Formation in Connecticut. For the purposes of the present report, we shall use the terms "schist" and "gneiss" and beg the questions of precise stratigraphy.

Characteristically the gneisses are hard, dense rocks that tend to break rather erratically, about as easily across the foliation planes as parallel to them. They are mostly quartz, plagioclase, microcline, biotite rocks with relatively little muscovite, in fact many of the gneisses contain no muscovite at all. Accessory minerals are not abundant in most of the gneisses, they tend to be small and widely dispersed through the rock where they do occur.

Characteristically, the schists are very well foliated mica-rich rocks which split easily along the foliation planes but tend to shatter when one tries to break them across the foliation. Most of the schists are very rich in muscovite, and contain varying amounts of plagioclase and biotite. They almost never contain potash feldspar but they commonly contain relatively abundant accessory minerals such as garnet, sillimanite, kyanite and staurolite. We have used the relative abundances of these accessory minerals

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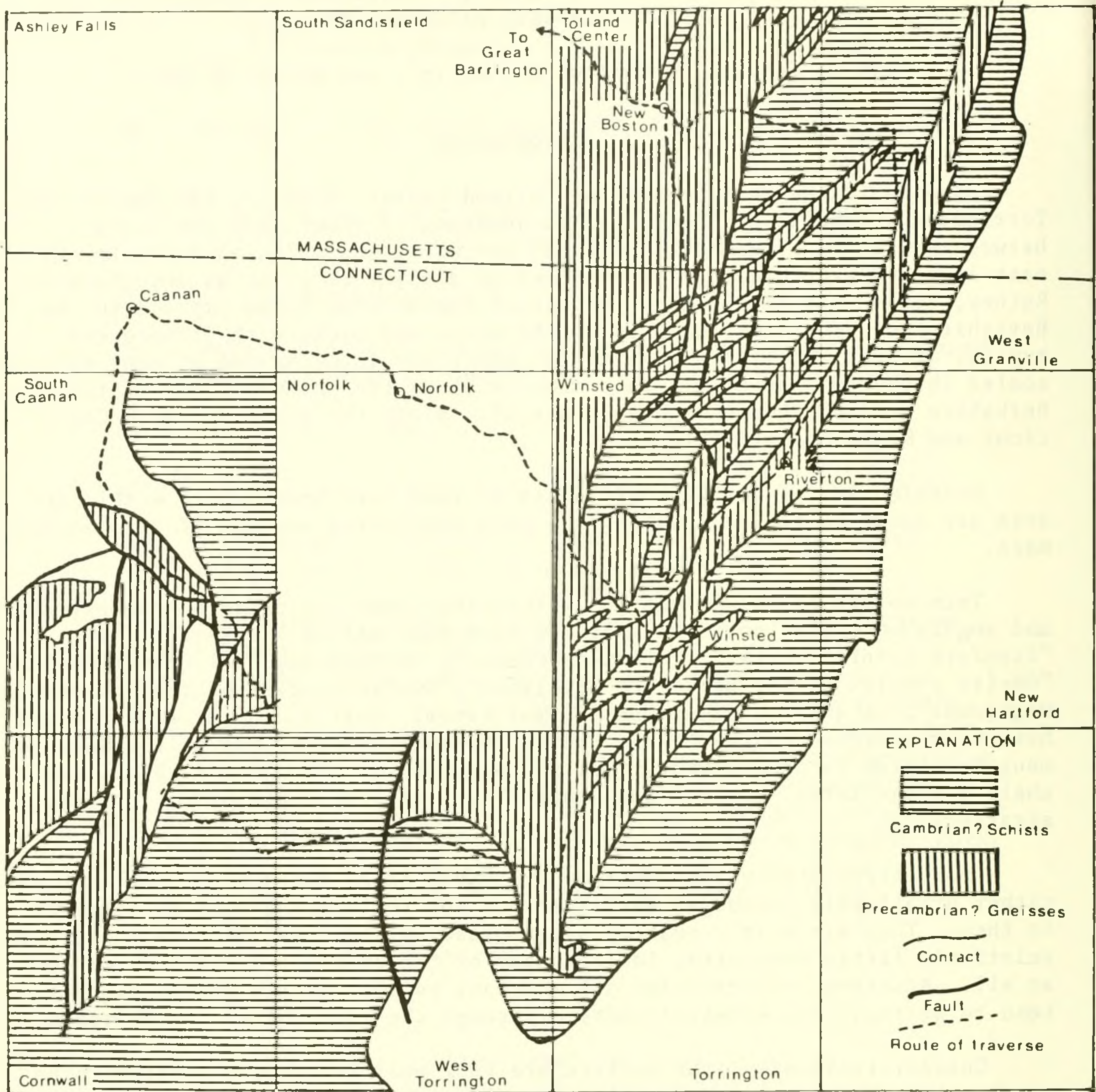


Figure 1: Generalized geologic map showing relations between Precambrian? gneisses and Cambrian? schists in western Connecticut and Massachusetts.

between beds to evaluate structural and stratigraphic relations in parts of the area.

The only purpose of this trip, however, is to examine the contact relations between the schists and the gneisses. We believe the contacts that we will show you will convince you that they are normal stratigraphic contacts. We believe that in some places there may be faults associated with these contacts, but we also believe most of the evidence indicates that many of the units are in perfectly normal stratigraphic contact. We shall show our evidence and let you decide if we have enough.

If there were a direct method for establishing the ages of the units we would have no problem. If the gneisses are metavolcanics, at least in part, then perhaps they contain enough zircon for accurate dating, but we have no direct way to get at the age of the sediments. In addition, the rocks are all at sillimanite grade metamorphism, and one may well suspect that metamorphism has reset any radiometric clocks that may have existed in these rocks.

Road Log

This road log is designed both for those attending the field trip in conjunction with the NEIGC meeting of 1975, and to offer interested individuals opportunities to observe other localities where the phenomena herein described are well exposed, but inaccessible to large groups. Side excursions for those individuals who plan to make a more thorough independent investigation, are separated from descriptions of the main part of the trip by double asterisks (**). Those who opt to take this trip as individuals are advised to obtain the following topographic quadrangle maps: Tolland Center and West Granville, Connecticut and Massachusetts; and Winsted, New Hartford, Norfolk, South Canaan, Cornwall, and West Torrington, Connecticut.

Mileage

00.0 Center of New Boston, Massachusetts, at the intersection of State Routes 8 and 57, on the bridge over the West Branch of the Farmington River. (New Boston is about 30 miles east of Great Barrington and can be reached by going east out of Great Barrington on Route 23, and following Route 57.) It is assumed that you are eastbound on Route 57. Immediately after crossing the bridge the road makes a sharp right turn, and then you make a sharp left turn, following Route 57 and up the long hill climbing Tolland Mountain.

Although outcrops are sparse in the areas immediately adjacent to the road, most nearby exposures in this segment of the traverse are competent, hard, two feldspar gneisses.

00.6 Tolland-Sandisfield town line.

03.8 Tolland Center. **In the brush, about at the 1519 bench mark, southwest of the road intersection, is an outcrop of porphyroblastic garnet schist, containing garnets about $\frac{1}{2}$ to $\frac{1}{2}$ inch in diameter. This schist is a relatively isolated occurrence of "Hoosac-type" schist well east of the main mass of Hoosac Schist. An additional side excursion

involves going north from Tolland Center on Clubhouse road, to Schoolhouse road, north on Schoolhouse road to Blandford road, east on Blandford road to Amos Case road, and left on Amos Case road to the 140 foot crest just west of Babb Hill. In the woods just to the west are abundant outcrops of both gneiss and schist, and many of these show contact relations between the rock types rather well. In addition, several different rock types commonly present in the Hoosac Schist, are abundantly exposed. A note of caution: Blandford road is not always passable, especially in the spring, and if a two-wheel drive vehicle is used care must be exercised before proceeding down Tow Hill.**

- 04.3 Intersection of Schoolhouse road, and Hartland road. **In the yard behind the school on the northeast corner of the intersection, are several small pavement outcrops that show very thin layers of gneiss and schist.**
- 04.4 Outcrops on both sides of the road are of Hoosac Schist.
- 06.6 Hubbard River, Granville-Tolland town line.**Outcrops on the east facing slope to the southwest, and in the stream valley to the north are poor, but some show the interlayering of the schists and gneisses. Contacts are not well exposed.**
- 07.0 West Hartland road, turn right (south) toward Granville State Forest.
- 07.5 Hubbard River. Turn left along road along north side of river. **In season there may be a parking fee, inasmuch as this is a State Park. Outcrops upstream along the river are both schists and gneisses, but in general they are poor and do not clearly expose contact relations.
- 08.0 Loop at end of road. At this time of year, parking should be no great problem, but the park road is narrow, and some caution should be exercised if we are to be able to turn around.

Outcrops are essentially non-existent along stream from bridge to this point. The area is interpreted to be underlain by Hoosac Schist.

Take trail from loop at end of road along east side of river going downstream. At about 2,000 feet, trail intersects high pressure gas line. Continue additional 500 feet along trail. In 1974, an abandoned boiler was alongside the trail at this point. Outcrops of interlayered schist and gneiss are on both stream banks from this point to about 200 feet downstream.

It is much slower to follow the stream valley, but there are nearly continuous outcrops of gray two feldspar gneiss from about the loop at the end of the road to the first schist outcrop.

After examining the outcrops, return to the cars and retrace route back to the main road at the bridge.

- 08.5 Main road, turn left (south).

- 10.8 State line. Marked by post on east side of road. Several outcrops in woods to west, of both gray gneiss and schist, but contacts are not well exposed.
- 11.9 Intersection with Connecticut State route 20. Turn right (south). Outcrops on both sides of road are of Hoosac schist with abundant pegmatite. We have seen no exposures of gneiss east of this road. According to our interpretation, we are near the top of the Hoosac.
- 12.7 West Street (Pinehurst Road on 1955 edition of West Granville quadrangle map). **At the south end, and in the woods to the north and east of Howells pond, which is near the end of West Street, are several rather poor outcrops of both schist and gneiss.**
- 13.3 New Hartford quadrangle boundary.
- 13.6 Junction with Connecticut State Route 181. Turn right (west), stay on Route 20.
- 14.7 Winsted quadrangle boundary.
- 16.4 Hogback road junction to right. Outcrops to left are of calc-silicate gneiss. These are included in the gneiss complex, they are not a typical Hoosac lithology.
- 17.0 Turn right (west) stay on Route 20. Hitchcock chair factory to right.
- 17.2 Riverton Connecticut. Turn left (stay on route 20).**About .1 miles farther, just across the bridge over the Still River an unnamed road to the left follows the West Branch on the Farmington River. The first outcrop, on the left side of this road, exposes an excellent contact between schist and gneiss. To the southeast along the road (mostly along the river bank) are scattered small outcrops of both schist and gneiss, but we saw no good contacts in this area. Continue to Pleasant Valley and turn right (south) on State Route 318. About 1.2 miles farther is junction of U.S. Route 44. Turn right (west). Outcrops on both sides of road are various gneisses. Continue west on Route 44 for about 2.4 miles. Turn left (south) on West Hill road. Along the west side of West Hill lake are scattered outcrops of Hoosac-like schist in a large area of gneiss. No good exposures of contacts were found in this area. Return to Route 44 and continue west to Winsted Connecticut. At the exit ramp of new Route 8 are several exposures of contacts between schist and gneiss, parking for more than one or two cars is difficult, however. Rejoin road log at junction of Routes 8 and U.S. 44 in the center of Winsted.**
- 19.3 Junction with State Route 8. Turn left (south).
- 21.2 Center of Winsted Connecticut. Junction with U.S. Route 44. Turn right (west).
- 23.1 Beginning of long road cut. Outcrops are mostly gray gneiss with a few thin layers of Hoosac-like schist near the east end, and abundant pink feldspar pegmatite and granite near the west end.

- 24.1 Entrance to Mad River Dam. Turn left through gate and park on top of dam. We will inspect the outcrops along the spillway where several exposures show the contact between schist and gneiss. When finished, return to cars and turn left (west) on Route 44. **If the gate across the road to the dam is locked, access can be gained by continuing west on Route 44 and making the first possible left turn. A secondary road goes east to the base of the dam, and access to the spillway can be gained by climbing the dam. Alternatively the outcrops along Route 44 can be studied, they show relations similar to those seen in the spillway cuts.**
- 38.1 Canaan, Connecticut, junction with U.S. Route 7. Turn left (south) on Route 7.
- 42.5 Junction with State Route 63. Bear left (south) on Route 63.
- 47.9 **Outcrops along road are of schist, on hills to east and south some contacts between schist and gneiss are exposed.**
- 49.8 Turn left on to dirt road and park where convenient. Walk to west (under powerline) to examine pavement exposures of contacts between gneiss and schist.
- Return to cars and turn right (north) on Route 63.
- 51.2 Turn left on secondary road.
- 52.0 Junction with State Route 43. Turn left (south).
- 56.4 Junction with State Route 4, continue straight ahead (south) on Route 4.
- 56.6 Junction with Great Hollow road. Turn left (south).
- 57.1 Mohawk Mountain Ski area. Turn left into parking lot and park where convenient. Walk across the bridge, and then left (north) to northernmost ski trail. Walk up the ski trail and examine outcrops in area to north and east. In this area are many scattered outcrops of both schist and gneiss, contacts are not well exposed but area shows thinly layered nature of the schist-gneiss interbeds. Return to cars and turn right (north) out of ski area.
- 57.9 (Milage is approximate and depends on how far you drove in the parking lot). Junction with State Route 4. Turn right (north).
- 58.1 Junction State Routes 128, 43 and 4. Turn right (east) on Route 4.
- 70.9 Junction with Main Street, Torrington Connecticut. Road is marked as Route 8 on older maps. Turn left (north).
- 71.5 "Y" junction, bear right along old Route 8. Hills to northwest are underlain mostly by gneiss, with thin interbeds of schist. If there is time we will stop and examine these exposures.

- 80.5 Junction with U.S. Route 44, center of Winsted, Connecticut. Continue north across intersection. Join State Route 8.
- 92.1 Small, thin schist layers occur in the valleys between these big cuts. A few can be seen near the ends of the cuts. Most are rather poorly exposed.
- 92.1 Park as far off road as possible. Outcrop on west side of road is a coarse garnet schist in contact with gray gneiss. The schist is lithologically identical to schists in the Hoosac Schist to the east. After examining this exposure, return to cars, continue north on Route 8 to New Boston Massachusetts, and then west on Route 57 to Great Barrington, Massachusetts.