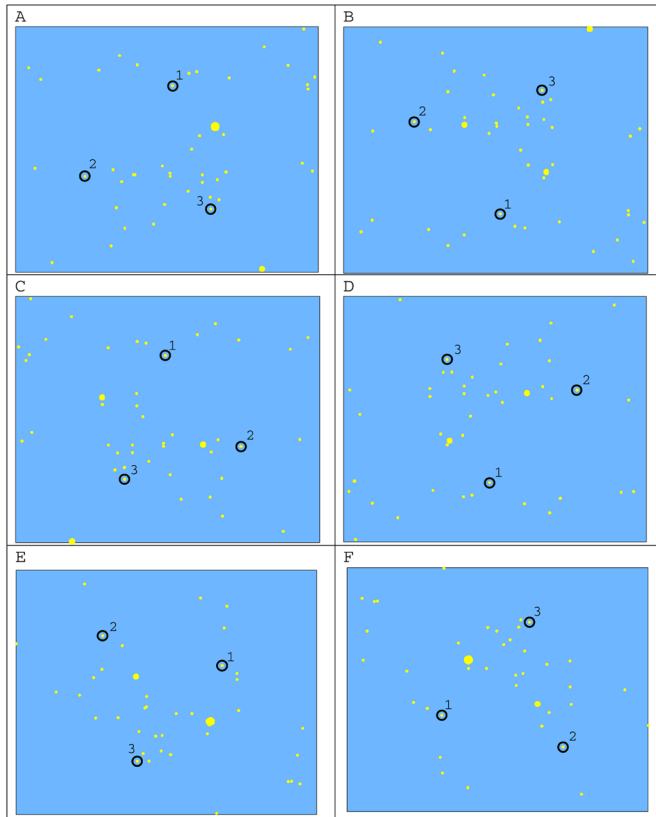## *color figures*

Figure 1. Global geographic masking methods used in this experiment.
A) Original incident locations, B) flipping about horizontal central axis of the map, C) flipping about vertical central axis of the map, D) flipping about both central axes of the map, E) rotating around the map center by 60° to the right, F) rotating around the map center by 120° to the left.
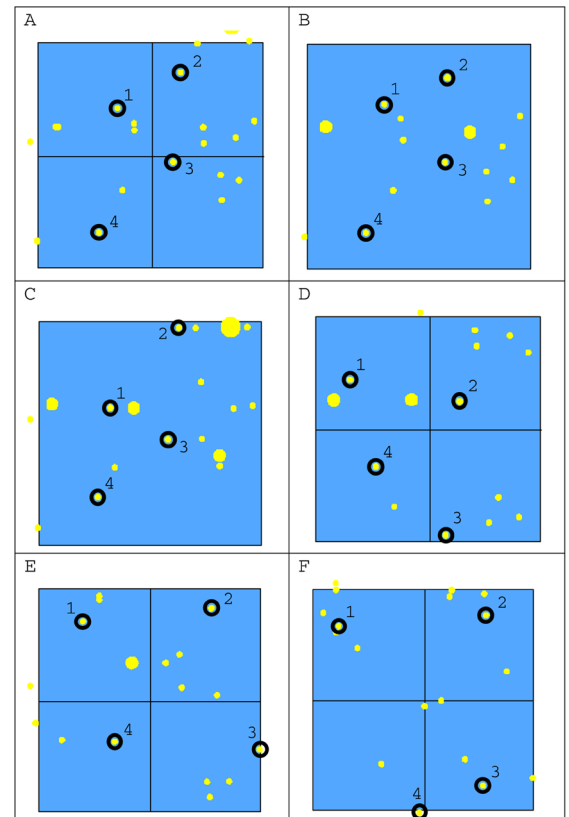

Figure 2. Local geographic masking methods used in the experiment (only a portion of the entire test map is shown).
A) Original incident locations, B) spatial aggregation at the midpoint of the street segment, C) spatial aggregation at the closest street intersection, D) flipping randomly either about the vertical, horizontal or both central axes of each grid cell, E) rotating by some random degree around the center of each grid cell, F) translating by some random distance.
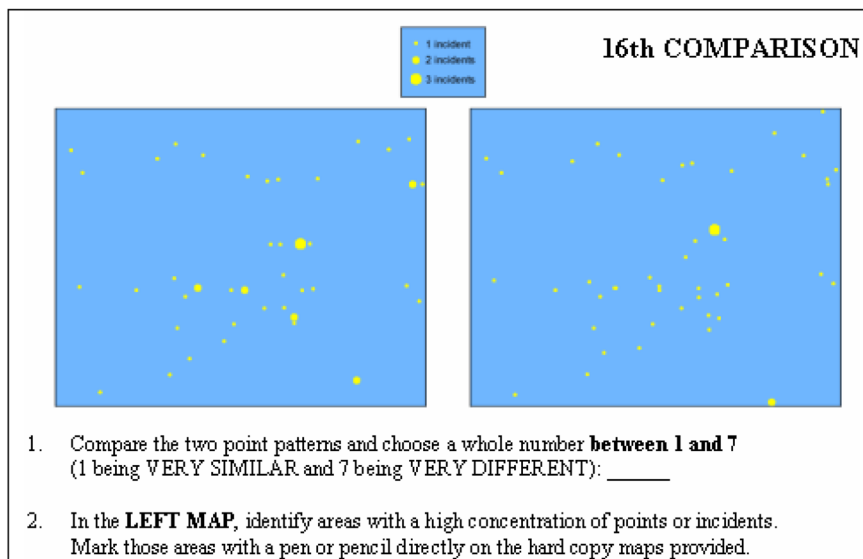

Figure 4. Example of a pair of test maps included in the experiment. All incident locations in the left map are locally masked by spatially aggregating them to their closest street intersection. All incidents in the right map are shown with their true, unmasked location.
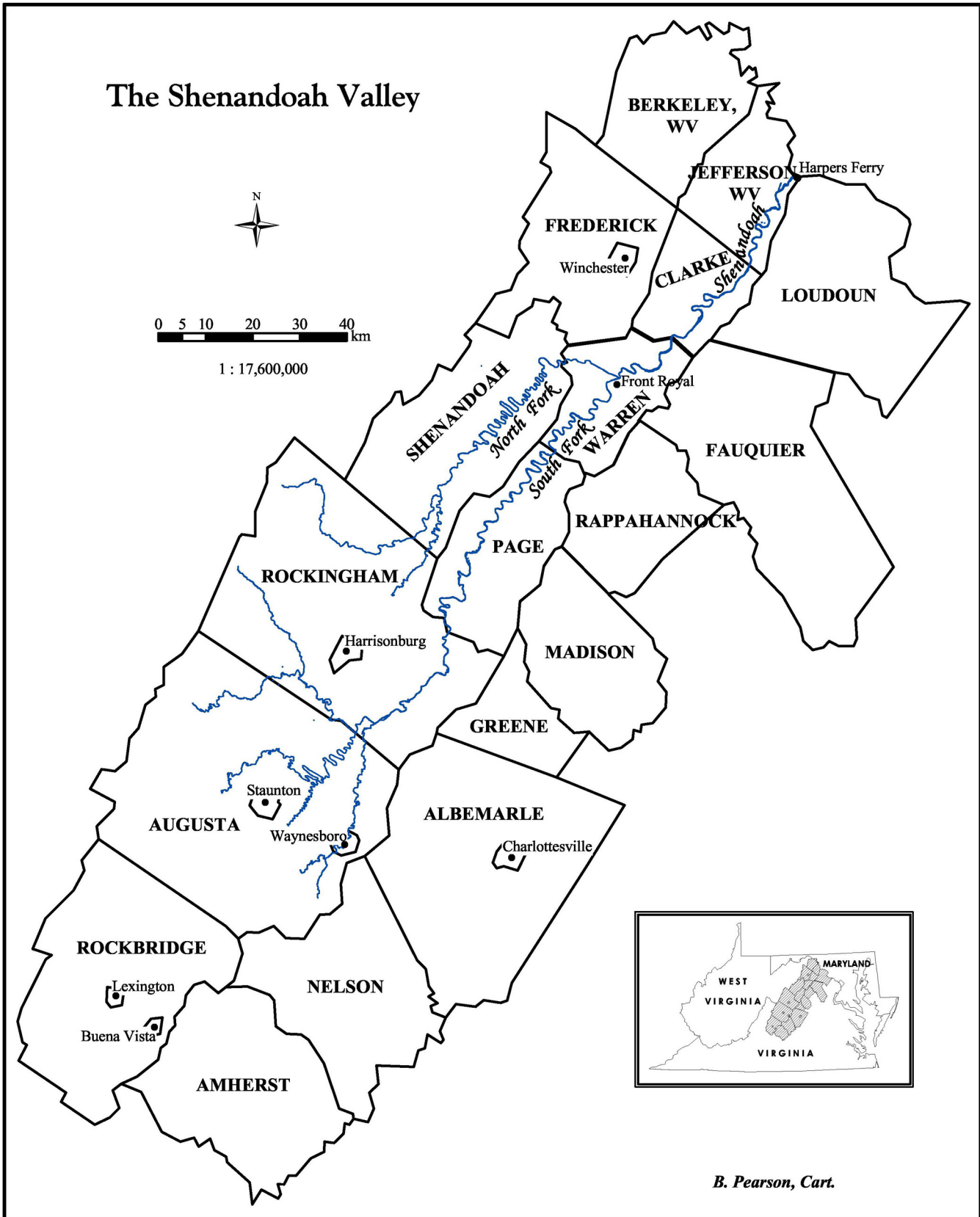
The Shenandoah Valley

N

0 5 10   20   30   40
km

1 : 17,600,000

BERKELEY, WV

JEFFERSON WV   Harpers Ferry

FREDERICK

Winchester

CLARKE

Shenandoah

LOUDOUN

SHENANDOAH

North Fork

Front Royal

South Fork

WARREN

FAUQUIER

PAGE

RAPPAHANNOCK

ROCKINGHAM

Harrisonburg

MADISON

GREENE

Staunton

AUGUSTA

Waynesboro

ALBEMARLE

Charlottesville

ROCKBRIDGE

Lexington

NELSON

Buena Vista

AMHERST

WEST VIRGINIA   MARYLAND

VIRGINIA

B. Pearson, Cart.

Figure 1. Map showing the theater of operations for the 1861 & 1862 Shenandoah Valley campaigns. The river system is from U.S. Geological Survey 7.5′ topographic quadrangles.
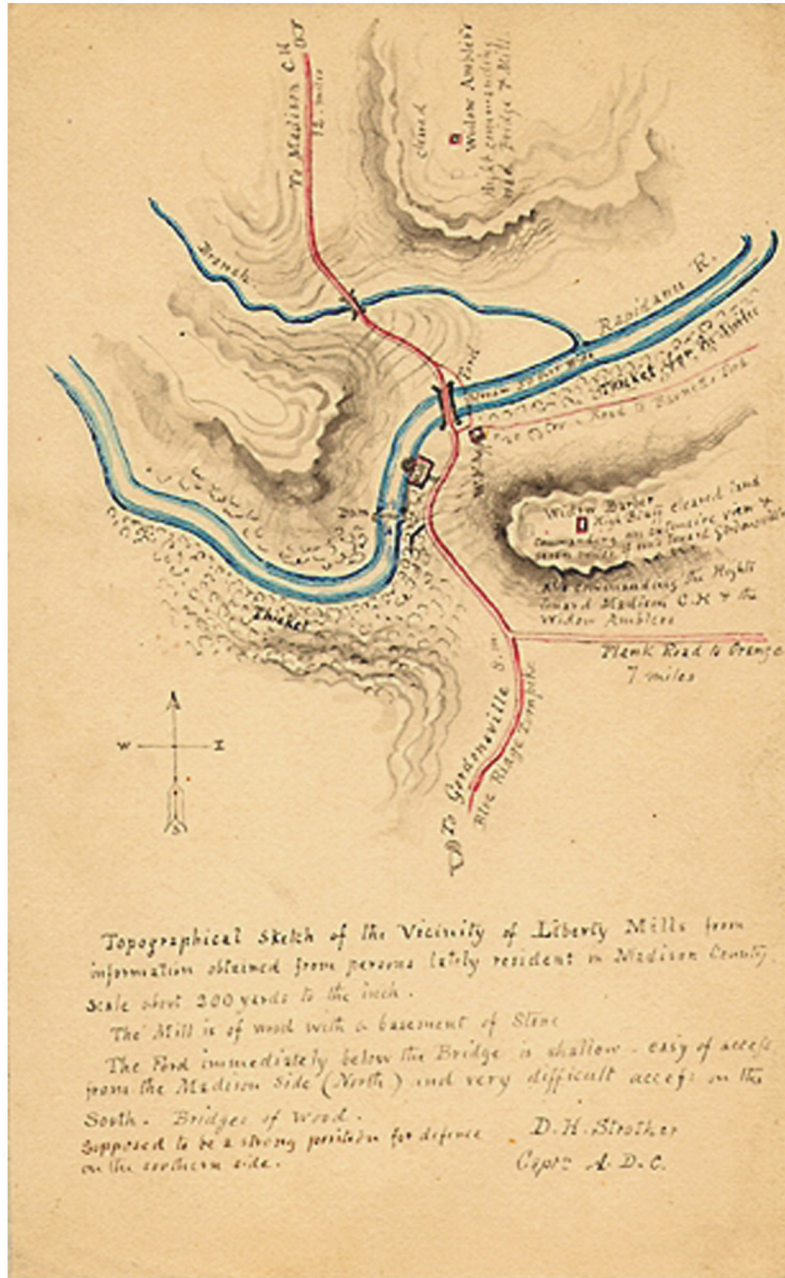
Figure 5. Strother's Topographical Sketch of the Vicinity of Liberty Mills*. Source: West Virginia and Regional History Collection.*

Inset A

Inset C

Inset B

BERKELEY, WV

JEFFERSON WV · Harpers Ferry

FREDERICK

Winchester

Inset A

CLARKE

LOUDOUN

· Front Royal

WARREN

FAUQUIER

RAPPAHANNOCK

PAGE

ROCKINGHAM

· Harrisonburg

Inset B

Inset C

Staunton ·

AUGUSTA

Waynesboro

MARYLAND

WEST VIRGINIA
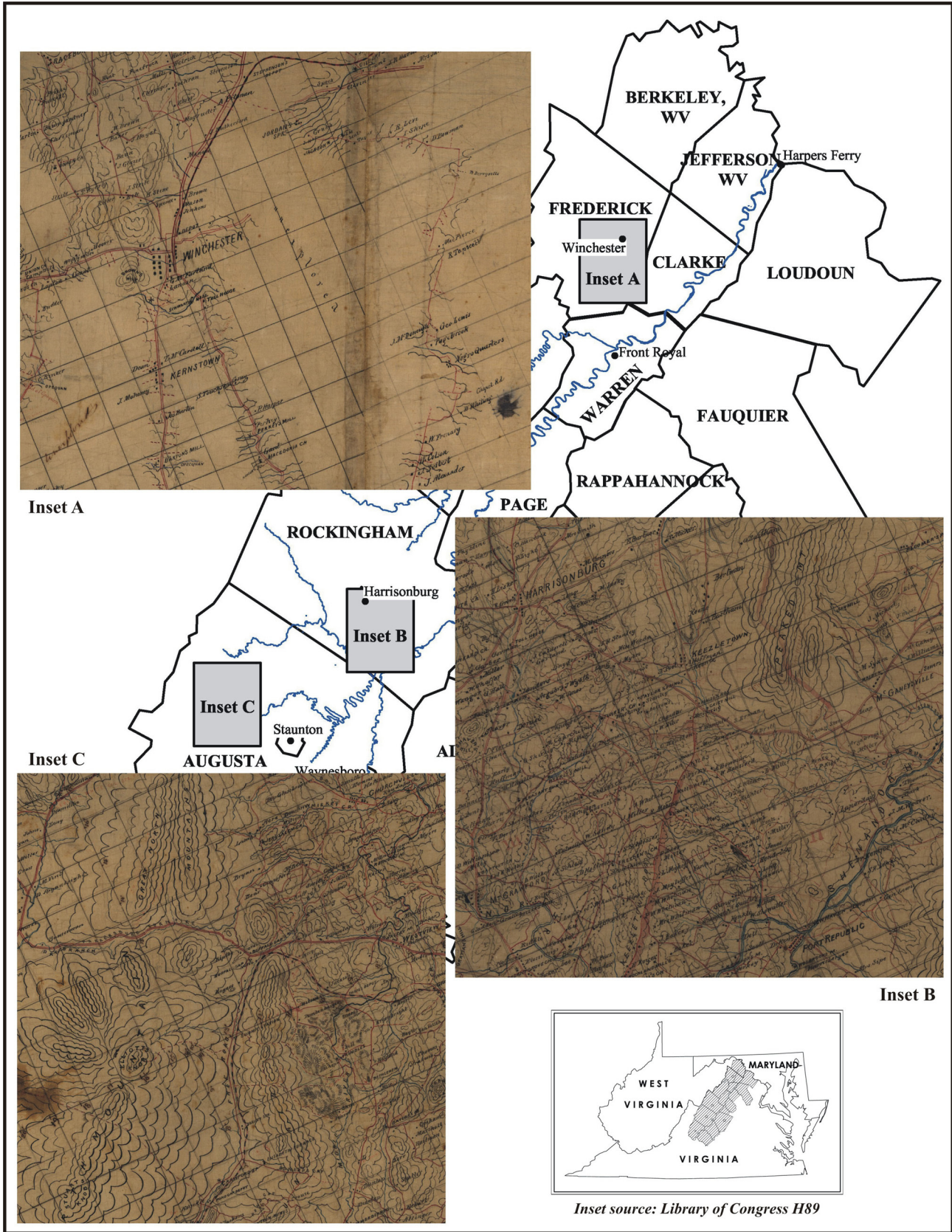
VIRGINIA

Inset source: Library of Congress H89

Figure 6. Details from Hotchkiss's Map of the Shenandoah Valley.

Figure 7. Hotchkiss's Sketch of the McDowell Battlefield. *Source: Library of Congress H94.*

The Shenandoah River from
USGS and Historical Maps

Harpers Ferry

Winchester

Shenandoah River

N
W   E
S

0   5   10   20   30   40   km

1 : 970,000

North Fork

Front Royal

South Fork

**Generally best agreement among representations
of the middle reaches of the Shenandoah system.**

Harrisonburg

Staunton

Waynesboro

Charlottesville

∿∿ **USGS Shenandoah River**

∿∿ **Abert 1861 Triangulation Survey**

∿∿ **Hotchkiss 1862 Valley Map (H89)**

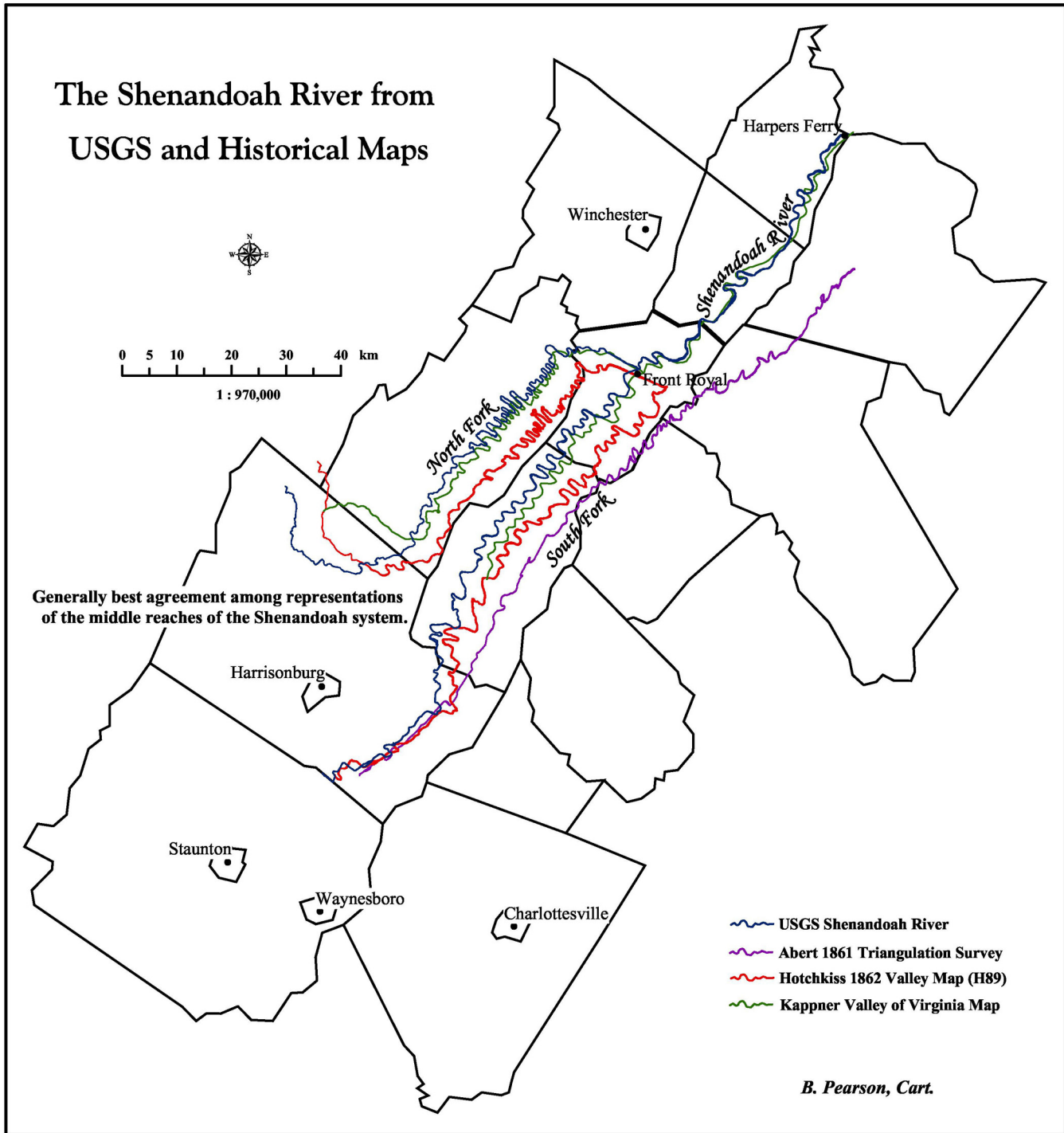∿∿ **Kappner Valley of Virginia Map**

B. Pearson, Cart.

*Figure 8. Map showing the Shenandoah river system as represented on historical maps by Abert, Hotchkiss, and Kappner, and in current U.S. Geological
Survey data.*