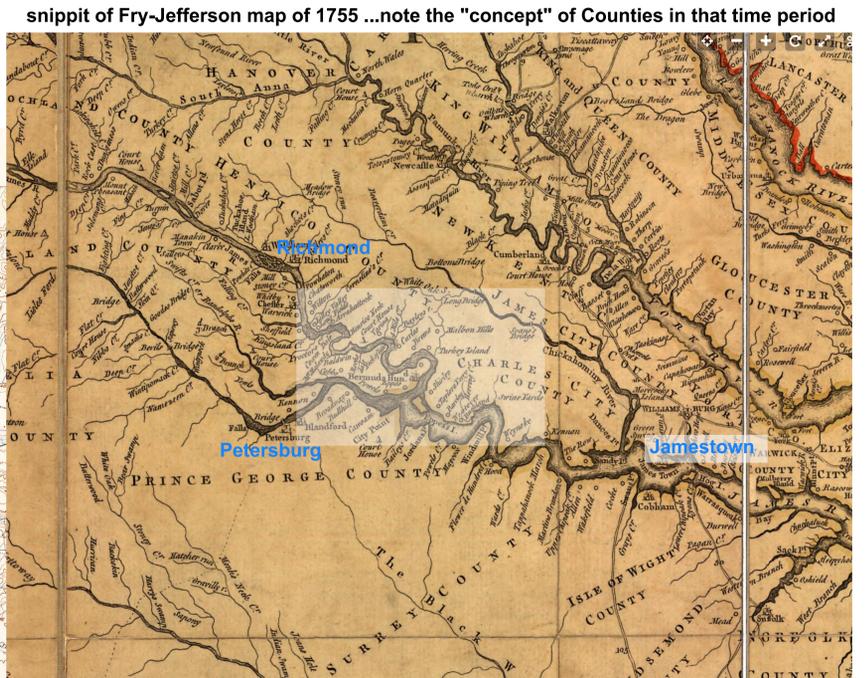
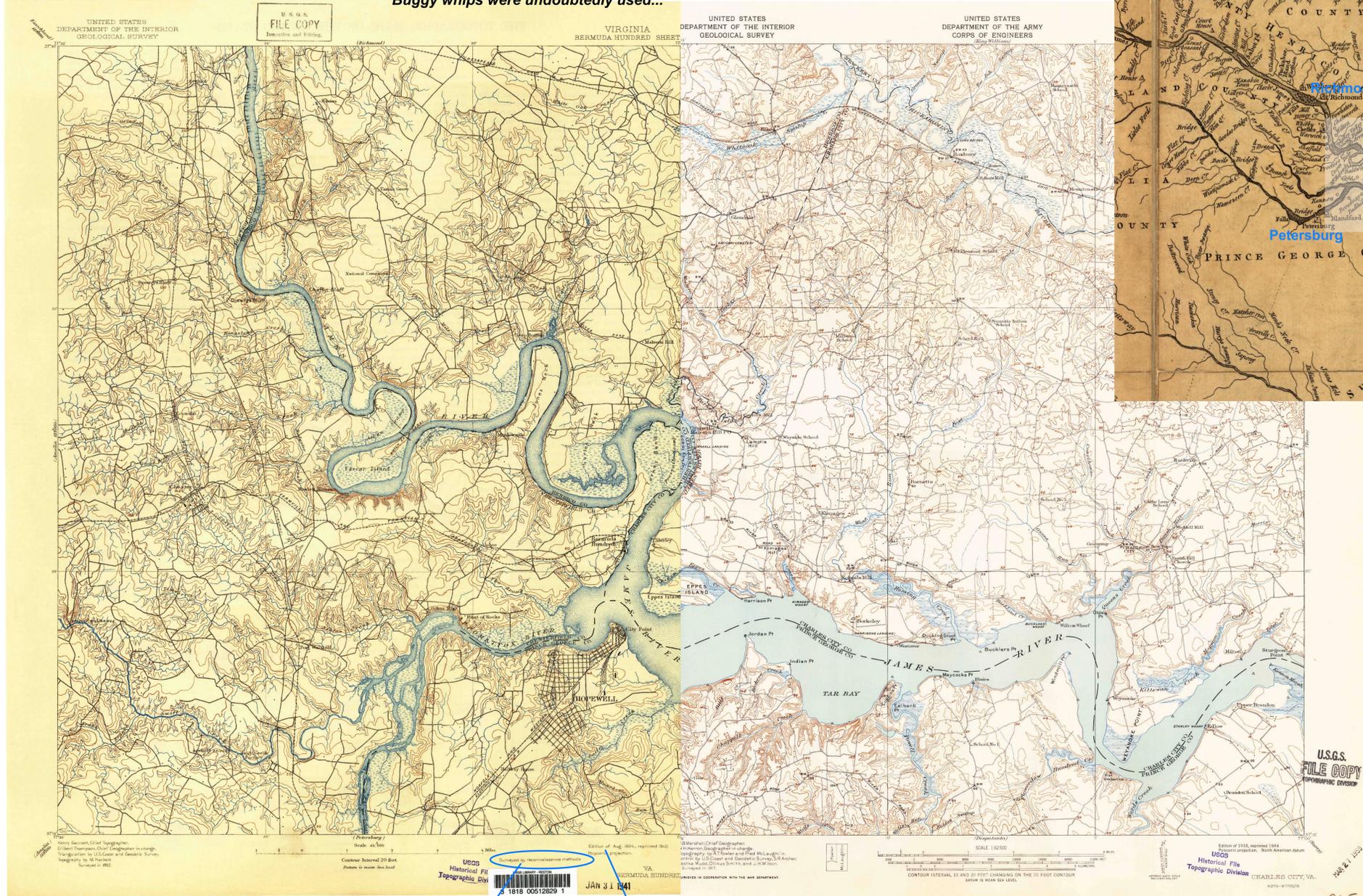


1894... This map was hand draw, hand lettered, and the equipment was hauled around by horseback.

Buggy whips were undoubtedly used...



This was the level of accuracy in 1755... which was woefully innacurate to depict a survey...

"Surveyed by reconnaissance methods"

By 1897–1920, the U.S. Geological Survey (USGS) continued to rely on **reconnaissance methods** for much of its early topographic and geological mapping, particularly in remote or western regions of the United States. These techniques were an evolution from the late-19th-century approaches but remained rapid, exploratory, and preliminary in nature, focused on covering large areas quickly with limited resources rather than achieving high precision. Continuation and Refinements of Reconnaissance Methods (1897–1920) Core Purpose and Scope: Reconnaissance surveys aimed to provide broad overviews of topography, geology, mineral resources, water supplies, and potential routes (e.g., for railroads, irrigation, or settlement). This was crucial during continued westward expansion, resource booms (oil, coal, metals), and post-Spanish-American War military needs. By this period, the USGS had shifted toward more systematic national coverage, but vast unmapped territories (especially in the West, Alaska, and rugged interiors) still required fast initial assessments before investing in detailed quadrangle mapping.

Mapping Scale and Detail Level: Work used small scales like 1:250,000 or coarser (e.g., 1:125,000 in some cases), resulting in generalized maps. Contours were often approximate or sketched with hachures (short lines showing slope direction) rather than precise intervals. Features like rivers, ridges, settlements, and trails were plotted roughly based on visual observation and basic measurements.

Field Techniques (Still Ground-Based but Evolving): Plane-table surveying remained the dominant method: Surveyors used a portable plane table (a drawing board on a tripod) with an alidade (sighting device) to sketch topography directly in the field from observation points. This allowed real-time drafting of contours and features while traversing on horseback, foot, or wagon.

Rough triangulation with theodolites/transits for angles and distances; barometric altimeters or aneroid barometers for elevations (accurate to tens of feet at best, not modern levels).

Visual sketching and pacing/chaining for positions; minimal heavy instrumentation due to mobility needs in rough terrain. Small field parties (geologists, topographic aides, packers) conducted traverses along rivers, ridges, or trails, noting rock types, fossils, stratigraphy, water sources, and cultural features.

Transition Toward Better Accuracy: By the early 1900s (especially post-1900), USGS standardized elements like uniform contour intervals (e.g., 20–50 ft) and symbology. Some areas received "intermediate" or "standard" surveys with denser control points. However, reconnaissance remained common for frontier or remote zones.

Emerging Aerial Influences: While full photogrammetry (using aerial photos for mapping) didn't become widespread until the 1930s (accelerated by WWII tech), early experiments with balloon/kite photography and military reconnaissance aircraft appeared by WWI (1917–1919). USGS topographic engineers contributed to these, but ground-based reconnaissance dominated 1897–1920.

Examples from the Period: Ongoing work in the West (e.g., Wyoming, Montana for oil potential; Alaska reconnaissance in the 1920s building on earlier efforts).

Surveys tied to resource classification (e.g., coal fields, artesian basins) or military needs (border areas post-1898).

By 1920, about 60% of the U.S. remained unmapped or poorly mapped, prompting calls for accelerated completion—reconnaissance filled gaps efficiently.

These methods were practical and cost-effective for a young agency mapping a continent-sized nation, but they involved approximations (e.g., positions off by miles, elevations rough). They built foundational data for later detailed quadrangle maps (e.g., 15-minute or 7.5-minute series) using triangulation networks and, eventually, aerial photos in the 1930s–1940s. The USGS Historical Topographic Map Collection (scans from 1884 onward) includes many such reconnaissance-level products for study today.



FIG. 1069. EARLY TWENTIETH-CENTURY PLANE TABLE USE. Willard D. Johnson and the Johnson plane table, Wasatch Range, Salt Lake County, Utah, July 1901. Image courtesy of the U.S. Geological Survey, Denver.

USGS Aerial Photos in the 1920s were part of early experimental efforts to incorporate photogrammetry (using aerial images to derive measurements and create maps) into topographic mapping, marking a shift away from purely ground-based reconnaissance surveys. Key Details on 1920s USGS Aerial Photography: Experimental Phase: The 1920s represented the beginning of USGS experimentation with aerial photos to replace or supplement the labor-intensive plane-table sketching in the field. This was driven by the need for faster, more efficient mapping of large areas, especially in the expanding West and for resource surveys. The USGS began testing photogrammetric techniques, where overlapping stereo pairs of photos (taken from aircraft) were viewed in stereoplotters to determine elevations and plot contour lines accurately.

This was a major innovation, as prior mapping relied heavily on manual ground observations.

Earliest Notable Example: In 1921, the USGS compiled the Michigan Schoolcraft Quadrangle (near Kalamazoo, Michigan) using 274 aerial photographs taken by Captain Albert W. Stevens of the U.S. Army Air Corps. This is widely recognized as the first U.S. topographic map compiled strictly from aerial photography (no ground surveying for the final contours). It covered about 225 square miles and demonstrated the potential of aerial methods for precise elevation data via stereo overlap.

I had the idea that, perhaps, balloons were used for aerial photography... but apparently not. Even that was too exotic in the 1890s.

The first successful, powered, controlled, and sustained flight by a heavier-than-air aircraft took place on December 17, 1903, at Kitty Hawk, North Carolina (specifically near Kill Devil Hills, about 4 miles south of the town of Kitty Hawk).



How, exactly, were fields plowed... before we had tractors?

For most of the USGS topographic mapping history (from the late 1800s through the late 20th century), lettering on maps was done by hand—specifically through hand-drawn lettering and hand-scribing techniques—rather than modern digital fonts or even early mechanical typesetting in many cases. Historical Overview of USGS Map Typography/Lettering Early Period (1880s–1930s/1940s):

USGS topographic maps were compiled, drawn, and edited entirely by hand. Cartographers (often called "topographers" or "draftsmen") used ink pens, ruling pens, and freehand techniques to letter place names, feature labels, and other text directly onto the map sheets or onto separate "lettering separates" (overlays for different map elements like culture/roads vs. hydrography). This was part of the traditional lithographic process: features were scribed (engraved) onto coated plates or stones, and text was often hand-lettered by skilled draftsmen trained in uniform styles for legibility at small scales.

No widespread phototypesetting or adhesive type yet; it was manual calligraphy adapted for cartography (e.g., simple sans-serif-like styles optimized for tiny labels on 1:24,000 or 1:62,500-scale quads).

Sources confirm: Maps were "hand scribed" and "drawn by hand," including lettering.

Mid-20th Century Shift (1940s–1970s/1980s):

As production evolved, USGS introduced tools like Leroy lettering sets (mechanical templates with pens/guides for uniform lettering, popular from the 1930s onward) and dry-transfer/adhesive-backed type (e.g., transparent Letraset-style sheets applied to map separates). By the 1950s–1970s, many maps used adhesive type for culture lettering (place names, roads, etc.), applied by hand to scribed plates before printing. This was still manual but more standardized than pure freehand.

Examples from USGS historical photos: Images show cartographers applying adhesive type to map separates (e.g., Miller Peak quad).

Contours and hydrography remained scribed, but text often used these mechanical aids for consistency and speed.

Transition to Digital (Late 20th Century Onward):

In 2009, USGS fully switched to US Topo maps, which are computer-generated using GIS databases and digital fonts (e.g., proprietary or standard typefaces like Souvenir/Univers in earlier redesigns, now more modern sans-serif). No hand lettering at all—everything vector-based and automated.

Why Hand Lettering Dominated for So Long: USGS topographic maps (especially the classic 7.5-minute quads from 1947–2006) were labor-intensive analog products.

Hand (or mechanically assisted hand) lettering ensured legibility at reduced scales, avoided crowding, and followed strict cartographic rules for hierarchy (e.g., bold for major features, italic for water names).

Modern recreations (like BellTopo Sans font) mimic the subtle, slightly irregular look of those old hand-lettered USGS labels.

In short: Yes, hand lettering was the primary system for USGS topographic maps through much of the 20th century, evolving from pure freehand to mechanical aids like Leroy sets and adhesive type before going fully digital in 2009.



A USGS topographer engraves topographic map information onto a copper plate for map reproduction.



FIG. 1073. WORLD WAR I AIRCRAFT WITH EARLY MAPPING CAMERA. Observer receiving French camera with Berthiot color lens for reconnaissance and photo work, Gondreville-sur-Moselle, France, 6 August 1918. Image courtesy of the U.S. National Archives, Washington, D.C.