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Military Cartography's Influence on Tolkien's Maps of Middle-earth

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Introduction

This paper sets out to answer a question that has been asked of the author on numerous occasions after making public presentations about cartography and Middle-earth: was J.R.R. Tolkien's experience as a signal officer in the First World War an influence on the way he drew maps of his legendarium? The connection posited by these questioners certainly seems plausible, since it is well established that many aspects of his stories were influenced by his time in the war (Garth 2003, 2020). Moreover, the making and reading of maps is a standard part of military officers' training. As an officer, Tolkien must be able to understand the terrain over which he would send his men to fight. While the finished maps published in *The Lord of the Rings* and *The Silmarillion* were drawn by the author's son Christopher, Christopher based his work on maps produced by his father during the writing process.

Finding an exact answer to this question requires a study of how maps would be drawn and used by the British military of the 1910s, as well as considering the wider context of maps that Tolkien would have encountered in his life, and a careful reconstruction of the process by which Tolkien produced his maps. This examination shows that Tolkien's initial mapping of Middle-earth is highly consistent with his background in military cartography, but that influence is reduced as he moved from his working drafts to the published maps with which most readers are familiar. His earliest maps for each of his published works match in style the maps he would have used in the military, and they were employed in much the way military maps would be – to track the movements of people and armies across terrain. As these working maps were transformed into publishable illustrations, they are redone in a pictorial style that bears more resemblance to the maps in contemporary children's literature.

Cartographic Background

A key aspect of any map is its symbology: the method of depicting geographical features. This paper pays particular attention to the symbology used to represent topography (features like mountains and hills) and forested areas. These features are very prominent in Tolkien's maps, and admit a variety of approaches to their depiction (see Figure 1), which enable us to trace stylistic influences.

Depicting elevation and topography has been an ongoing challenge for cartographers (Collier et al. 2003). A map is a flat page stretching north to south and east to west, but elevation adds a third dimension of features that stick up from or push down into the page. In our surviving ancient and medieval European maps, mountainous areas are typically shown as shaded regions, or as jagged-topped linear fences, sometimes referred to as "cock's combs" (Harley and

Woodward 1987). In the modern era (after 1500 CE or so), four methods of showing topography became common in Western maps prior to the rise of digital Geographic Information Systems: pictorial, hachure, contours, and hillshading.

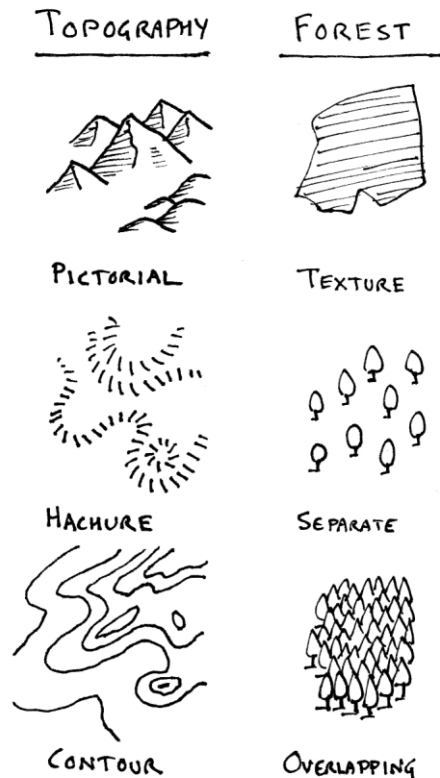
Pictorial representation of topography consists of drawing illustrations of mountains and other features in side-view. This approach was standard among early modern cartographers like Gerardus Mercator, Abraham Ortelius, and Albertus Magnus (Harley and Woodward 1987). Pictorial representations give the reader a quick feeling of the terrain, and resemble the way mountains would be seen by people on the ground. But they do not allow the map to convey exact detail about elevation, and they privilege one side of the mountain, obscuring what lies behind.

Hachures arose as a way of giving more exact depiction to terrain, for purposes of engineering and military planning. Hachures consist of small lines drawn up-and-down a slope. Short thick lines indicate steep slopes, while long thin ones indicate shallow slopes. Mountains drawn by hachure are sometimes compared to caterpillars, with the central ridgetop surrounded by hachure “legs” radiating out on all sides.

Contours are defined as lines of constant elevation. They form concentric rings around hills and mountains, each indicating an elevation a certain interval (say, 20 feet) higher or lower than the contours to either side. A contour map is extremely effective at conveying exact information about elevation, but can be confusing for an untrained observer to read (as the author has found in teaching introductory geography courses).

Hillshading involves coloring in the map as if the topography was being lit by a constant light source from the side. Hillshading can be very effective at making the terrain easy to intuit, and is thus often combined with contours, or used as a background to a map of other features such as roads. But on its own, hillshading does not convey exact elevation information.

With respect to forests, two main approaches are found. First, forests may be drawn pictorially, with little drawings of trees. These trees may be separate individual ones, overlapping areas of trees, or merged together into a kind of



cloud-like formation. Second, a color (commonly green) or texture may be applied across the forested area. The separate-trees, texture, and color approaches have the advantage of allowing other features, such as topography, to be shown in the forested area. On the other hand, a continuous area of overlapping or merged trees better conveys the feeling of a dense, closed-canopy forest.

Another significant aspect of a map to be considered is the importance it assigns to geometric accuracy. Beyond an extremely localized area, no flat map can be perfectly accurate in all respects in depicting the geometry of a round earth. A variety of projections have been developed by cartographers to achieve different balances of accuracy in distances, areas, and compass angles on maps. Medieval European maps typically gave little concern to geometric accuracy, as they were more interested in portraying a worldview or theological moral, for an audience unlikely to travel more than a few dozen miles from home in their lifetime. The rediscovery of Ptolemy's work on projections, combined with the increased importance of using maps for navigation during the age of European colonialism, is typically pointed to as a crucial marker of the start of the modern era of cartography (Harley and Woodward, 1987). Today, geometric accuracy is widely taken for granted as an obvious necessity in a map. But there remain contemporary maps, such as subway maps or pictorial maps intended for tourists, which sacrifice geometric accuracy in favor of legibility and pleasing composition.

Tolkien's Influences

We can look at three possible sources of influence on Tolkien's cartography: literary maps, practical maps, and formal cartographic training.

Space prohibits a comprehensive consideration of the history of maps in literature. One area of particular interest, though, is maps found in children's literature. Tolkien's first published maps were in a work of children's literature (*The Hobbit*), and they set the tone for his future published maps. Numerous works of children's literature published in the early 20th century establish a common pictorial style of cartography. *The Wind in the Willows* (Grahame 1908), published in 1908, contains a detailed pictorial map of "The Wild Wood and surrounding country." A.A. Milne's *Winnie-the-Pooh* likewise has a pictorial map of the "Hundred Aker Wood," allegedly drawn in part by the character Christopher Robin (Milne 1926). The dust jacket for the first edition of Arthur Ransome's *Swallows and Amazons* from 1930 (Ransome 1930) contains a rough pictorial map, with cloudlike forests and drawings of houses and tents. Later editions increased the realism of the illustrations, adding elements of pictorial topography such as hills and cliffs.

It is also worthwhile to consider maps in adult fantasy novels. Many of the notable pre-Tolkien adult fantasies, such as E.R. Eddison's *The Worm Ouroboros*

(Eddison 1922), were originally published without maps. The same is true of the works of William Morris, with the exception of his posthumously published *The Sundering Flood* (Morris 1897), which included a detailed pictorial map. In that work, Morris provides one of the earliest examples of creating a medieval atmosphere through the use of a pictorial map inspired by early modern European cartography (Ekman 2013).

To determine precisely what maps Tolkien used for practical purposes, such as navigating to various destinations, is an impossible task. However, it is possible to examine some examples of maps he was likely to have encountered, to demonstrate the sorts of cartographic representations he would have been familiar with.

It is likely that on his 1911 hiking trip through the Alps, which heavily influenced the development of his legendarium (Garth 2020), Tolkien would have consulted a guidebook such as Baedeker's *Switzerland* (Baedeker 1911). The editions of this guidebook available at the time are richly illustrated with maps, all of which use detailed hachuring to depict the mountainous terrain. Another set of maps with which Tolkien was likely familiar are those produced by the Ordnance Survey (National Library of Scotland 2020b). These maps were produced at consistent scales covering all of Britain. The maps from the beginning of the 20th century used hachuring to depict elevation, and separate pictorial trees for forested areas. By the 1920s, the symbology of the Ordnance Survey had shifted to contour lines for elevation and a combination of color and texture for forests.

Tolkien received formal instruction in the use of maps at one critical juncture in his life: his training, in 1916, as a signal officer in the British Army (Timpf 2017). He scored well on the map-reading portion of the examination (Garth 2003: 134), and presumably had opportunities to practice his skills on various occasions during his period of service in the First World War. Highly accurate maps were essential in planning troop movements, calculating artillery fire, conveying messages between units, and planning attacks and defensive maneuvers (Chasseaud 2013; Heffernan 1996).

I have been unable to locate the specific training materials that Tolkien would have used, but a review of British military training manuals from the era shows a great deal of consistency in approach (e.g. Martin's Lane 1912; Legge 1915; Hutchinson 1915). After introducing basic elements of scale and direction, these manuals give close attention to the issue of elevation and topography. The primary representations of topography are through contour lines, so a trainee like Tolkien can be expected to have learned to read a contour map. Some manuals also make reference to hachures, which had been important in 18th century military maps but were being phased out by the time of the First World War. It is plausible, though by no means certain, that Tolkien would have worked with hachure maps during his military service.

During the war, great efforts were made to produce improved maps of the Western Front (where Tolkien fought), building on existing French and Belgian maps with new information derived from captured enemy maps, ground-based surveying, and increasingly from aerial photography (see generally Choussead 2013; Heffernan 1996; Mitchell 2016; Murray 1988). The original maps often used hachure to portray elevation, but revised maps drawn for the British army employed contour lines. Forested areas were typically drawn as isolated pictorial trees (National Library of Scotland 2020a). Large numbers of maps were produced over the course of the war. Initially security concerns meant that only enemy trenches and installations were marked, with friendly ones left out, but over time the practical need for maps of one's own trenches (plus the fact that users frequently drew them in anyway) led to both sides' fortifications being printed.

It is worth noting that geometrical accuracy is of the essence in military cartography. If you cannot read the exact distance or direction to your target from the map, you will find yourself lobbing artillery shells into empty fields or even your allies' trenches, or dispatching supplies and reinforcements by inefficient routes. The Allies gained a major advantage in the war through their mastery of "predictive fire" – aiming artillery on the basis of geometrical calculations, to avoid having to make test shots that would give away the element of surprise before a bombardment (Chasseaud 2013). By contrast, many literary maps play fast and loose with geometrical accuracy – indeed, those depicting magical lands may find that no such accuracy is even possible in the shifting geography of faerie (Padron 2007). Military training would have impressed upon Tolkien the importance of precision in distances and directions when reading a map.

The Development of Tolkien's Maps

Tolkien famously stated that he "wisely started with a map" in developing his legendarium (Tolkien 2000: 177), but that is a bit too pat of an answer. The detailed study of the development of his work given by his son Christopher in the *History of Middle-earth*, and by John Rateliff (2007) in *The History of the Hobbit*, show the text and the map evolving together, with influence running in both directions. This ensured that Middle-earth would be a mappable world, in contrast to works such as Dante's *Inferno* or Moore's *Utopia* that were only ever mapped – with inevitable inconsistency – post-hoc (Padron 2007).

A map attached to a work of fiction can play one or more of three roles (Ekman 2013; Timpf 2017). It can be a *doceme*, that is, an artifact from within the story world. It can be a *text*, that is, a medium for conveying the story. And/or it can be a *paratext*, a piece of supplemental material serving to guide the reader

(and author) through the story contained in the written text. The role(s) played by a literary map will shape its construction and content.

It seems clear that (with the exception of Thrór's Map), Tolkien primarily conceived of his maps as paratexts – first for himself as author, then for the reader. In this conclusion I depart from Behrooz (2019), whose analysis of Tolkien's maps treats them as docemes produced in Middle-earth. Tolkien kept extensively edited working maps to help himself plan and organize the writing of the story. The manuscript of *The Lord of the Rings* was initially submitted to the publisher without any maps, but in his letters he repeatedly insists on the necessity of including them for the benefit of the reader, discussing them alongside other paratextual material that would eventually become the Appendices to *The Return of the King* (e.g. Tolkien 2000: 141, 160). He also apologized to draft reader Naomi Mitchison that “I am sorry about the Geography. It must have been dreadfully difficult without a map or maps” (Tolkien 2000: 144) (though Timpf, 2017, disagrees with Tolkien's assessment of the maps' necessity).

The Silmarillion

The earliest elements to Tolkien's legendarium were conceived during his years as an undergraduate at Oxford, but he only began to write down his stories in extended form upon returning from the battlefields of France, and it appears to be at this time that he began to draw maps of Middle-earth. The so-called “Earliest Map” of Valinor and Beleriand, drawn around 1919 (Tolkien 1983: 81) is an extremely rough line sketch, providing little grist for inferring influences.

Of more interest is what Christopher calls the First Silmarillion Map, a map of Beleriand and the lands to the north drawn sometime in the 1920s (Tolkien 1986: 219; McIlwaine 2018: 223). This map uses a pictorial style to show forests, as regions of separate individual trees (rather than the continuous overlapping trees seen in the published maps). Elevation is shown through contour lines, which are found throughout the map, not just in mountainous areas. Additionally, a sort of spine (possibly based on hachure techniques) runs along the crest of the Ered Lomin. The combination of contour lines across the entire map, with forests shown as individual pictorial trees, is precisely that used in British trench maps from World War I (National Library of Scotland 2020a). In addition to depicting geographical features, this map includes names of characters and peoples at locations significant to the story. This was a well-used working map, which Tolkien used as he plotted out the journeys and crossings of paths for his legends.

In the 1930s, Tolkien produced the Second Silmarillion Map (Tolkien 1987: 407; McIlwaine 2018: 227), which is the direct predecessor of the finished map drawn by Christopher for the published *Silmarillion* (Tolkien 1977). The Second Silmarillion Map, in addition to being much cleaner, adopts a simple

pictorial style for illustrating mountains. While Tolkien would continue to revise and rewrite his stories over the remaining half century of his life, by this point the geographical elements – who went where at what time – were largely fixed.

The Hobbit

Tolkien produced two maps for *The Hobbit* (Tolkien 1937) – a copy of Thror’s map of the Lonely Mountain (notable for being a doceme that appears within the story), and a general map of Wilderland showing the places visited by Thorin’s company. Additional maps were considered as the book was prepared for publication, but were ultimately dropped (Hammond and Scull 2000).

Thror’s map was drawn very early, with a draft produced in the 1920s known as Fimbulfambi’s Map (after the original name of the character) (Rateliff 2007; McIlwaine 2018: 290). On Fimbulfambi’s Map, the Lonely Mountain is shown through hachure. The map was revised for publication in 1936, at which point a pictorial style was adopted.

The Wilderland Map seems to have been drawn late in the writing process, with the first draft – nearly exact in geography, but cruder in style, than the published map – dating from 1936 (McIlwaine 2018: 317). The story of the *Hobbit* is a linear sequence of events and places, so it seems that Tolkien did not feel the need to have a working map to sort out distances and journeys in order to keep them internally consistent. Both the draft and final version of the Wilderland Map use a pictorial approach to depicting mountains. The draft map uses a texture of concentric ripple lines to show the forested area of Mirkwood, which is then rendered as an area of continuous overlapping pictorial trees in the published map.

The Lord of the Rings

Tolkien went through several drafts of his maps for *The Lord of the Rings*. These form three traditions, each culminating in one of the published maps: the map of the Shire, the map of Northwest Middle-earth, and the map of Gondor, Rohan, and Mordor (hereafter G/R/M) (Tolkien 1954, 1955).

The first Shire map was drawn in 1938, as he was beginning to compose his *Hobbit* sequel (McIlwaine 2018: 390). Very little elevation is shown on this map – for example, the Green Hill Country is labeled but no hills are shown. The Hill, where Bag End is located, is indicated through hachure. The Barrow-downs off on the distant margin are sketched in pictorially with extremely rough inverted-u shapes. The Old Forest is simply labeled, while a few individual pictorial trees mark out Woody End. The final version published in *The Fellowship of the Ring*, redrawn by Christopher, adopts a pictorial depiction of

hilly areas within the Shire, while cropping out the Barrow-downs. Forests are shown as areas of overlapping trees.

The so-called First Lord of the Rings Map, covering northwestern Middle-earth, was Tolkien's working map through most of the writing of the story. It evolved over the course of 12 years, from 1937 to 1949, with numerous alterations and additional elements pasted on (Tolkien 1989: 304; McIlwaine 2018: 398). It is clear both from the numerous changes to the map and from various notes and outlines written by Tolkien (chronicled by Christopher in *The Treason of Isengard*) that he was taking great pains to keep the distances and routes traveled by his characters consistent, and that the map was a key tool in doing so. This is consistent with his later declaration that "start[ing] with a map" enabled him to exercise "meticulous care with distances" (Tolkien 2000: 177). This first map makes use of hachure to depict mountains and hills, and forests are shown either as areas shaded in green (Old Forest), ripple texture (Fangorn), or individual trees (Mirkwood).

In 1948, Tolkien produced an updated map, called by Christopher the Second Lord of the Rings Map (Tolkien 1988: 433; McIlwaine 2018: 378). This map underwent relatively little alteration, as the major geographical issues in the story had been worked out. This map uses a combination of contour lines and hachure to depict topography, and solid green shading and/or ripple lines to depict forests. Christopher's published map drew its geography directly from the Second Map, while adopting pictorial mountains and overlapping pictorial trees. In doing so, he brought it into stylistic conformity with the Wilderland map from *The Hobbit*.

Tolkien's more detailed maps of the G/R/M border area began with a map of the area from Minas Morgul to Minas Tirith in 1944 (McIlwaine 2018: 386), then two drafts of a broader map in 1946 (McIlwaine 2018: 394). The goal of these close-up maps was to sort out, for both the author and reader, the movements of armies and characters during the Battles of Pelennor Fields and the Morannon (Tolkien 2000: 187). In all of these maps, Tolkien used contour lines to depict elevation, and individual pictorial trees for forests. That is, he used the same cartographic style as his First Silmarillion Map, and the trench maps used in his war days. When these maps were re-drawn by Christopher for *The Return of the King*, he maintained the use of contour lines, but switched to overlapping trees for the forests.

Analysis

Comparing the development of Tolkien's maps for his three principal works, there is a consistent pattern. His earliest maps are working maps, which evolve in conversation with the developing story. He approaches these maps in much the way that a military officer would, with a concern for being exact about distances that individuals and armies can travel, and topographic barriers to their maneuvers. This is reflected in his use of stylistic conventions similar to those he would have encountered in military maps – hachures and contour lines for elevation, with individual pictorial trees for forests that allow underlying topography to show through. These more exact ways of depicting elevation help to ensure plausibility and accuracy of his characters' maneuvers. Once the geographical framework of the story is settled, Tolkien then shifts to a more pictorial style of map (a process completed by Christopher in the case of the *Silmarillion* and *Lord of the Rings* maps). This pictorial style is more intuitive to the reader (who can trust that the author got his timetables of journeys and military movements correct), as well as helping to convey a sense of antiquity since this approach is associated with maps from the early modern period. The major exception is the published topographic map of G/R/M. Yet in this case, the reasons for departing from the pictorial style are not hard to see: the events of *The Return of the King* turn heavily on the exact movements of characters and armies across this more limited area of land, and so the more exact depiction of topography gained from a contour map is useful to the reader¹.

It seems, then, that Tolkien's military experience was an influence on his use of cartography in the initial development of his stories. In working out the geography of Middle-earth, he produced maps much like those he used in the war. But when it came time to create maps suitable for publication, Tolkien was more influenced by maps from children's fantasy literature and early modern European maps. Military maps are in the genealogy of the published maps of Middle-earth, but their influence is hidden.

Observing this pattern dispenses with a potential related question: was Christopher influenced by his own military training, obtained during his service in the Second World War, when he created the finished maps for publication in *The Lord of the Rings* and *The Silmarillion*? This can be answered in the negative, for three reasons. First, the pictorial style of his maps closely imitates that used by his father in the published map of Wilderland from *The Hobbit*, leaving little room for additional influences from Christopher's biography. Second, the content of Christopher's maps, down to the exact shapes of coastlines, directly matches the latest drafts made by his father. Thus Christopher re-drew the maps, making them clean and neat, but did not re-map the underlying world in any significant way.

1 However, when the maps were re-done by Shelly Shapiro for the 1988 Ballantine paperback edition of *The Lord of the Rings*, she applied the same pictorial style to the mountains and forests of the general map in the first two books and to the G/R/M map in the third book.

Finally, the movement of the maps in Christopher's hands was away from the kind of mapping done in the military. Christopher would have been trained in the use of contour maps (hachures having gone out of fashion), as pictorial maps are of little use in military applications. But with the exception of the G/R/M map, the maps he drew were pictorial ones.

Conclusion

The maps of Middle-earth accompanying J.R.R. Tolkien's works have become icons of his world, and major influences on the development of the fantasy genre. The published maps use a pictorial style that bears little resemblance to the maps that Tolkien would have used as a signal officer in World War I. But in tracing back the genealogy of these maps, we find Tolkien developing his stories using a mapping style that closely resembles the trench maps he would have encountered during his service.

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