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## Images of *The Rise of the West*: Cognitive Art and Historical Representation\*

WILLIAM MCNEILL'S *The Rise of the West* is one of the foundational texts of the field of world history. When it was published in 1963, reviewers hailed the book for the new paradigm it advocated—that civilizations did not develop in isolation but grew as a result of contact with other civilizations and the exchange of ideas and techniques that resulted—and in 1964 McNeill was awarded the National Book Award.<sup>1</sup> As a testimony to the book's significance, *The Rise of the West* remains required reading in many graduate-level world history programs. As part of the preparation of the book, McNeill commissioned Hungarian-born artist Bela Petheo to design and draw a series of illustrations to accompany the text. McNeill and Petheo collaborated closely on the design of the illustrations, McNeill's active role in the visual design demonstrating the value he placed on these images. McNeill himself often sketched out crude diagrams to clarify his thinking, and the illustrations in this book were to be a more formal representation of that process. Therefore, he did not view the illustrations as mere supplements to or distractions from the text, but rather as a vital and necessary part of the book. In fact, McNeill noted in the introduction that the diagrams could

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\* The images discussed in this article should be viewed online at <http://www.bu.edu/historic/staley.html>.

be viewed alone, without the text, providing a coherent visual narrative of world history.

While reviewers have long admired McNeill's words, they have been less than charitable with Petheo's images. Most reviewers have paid no notice to the illustrations, while others noted them only to deride them. In his *New York Times* book review, for example, Hugh Trevor-Roper found the text "learned," "intelligent," and "stimulating," but dismissed the images as "trivial and unhelpful." Lefton Stavrianos, in his otherwise laudatory review, noted that "the banal and frequently confusing pictograms have no place in a study of such sophistication and stature."<sup>2</sup>

The dismissive comments of these reviewers are not out of line with the attitudes of most historians toward visual images. Most historians continue to believe that "serious history" is written history.<sup>3</sup> Diagrams, charts, and other visual images are distractions from the "real history" historians locate in the text. Such images might be, at best, appropriate for school children or the general public, so this argument goes; however, images cannot be considered a meaningful part of serious historical discourse. As Hayden White once observed, historians "are inclined to use visual images [merely] as a complement of our written discourse, rather than as components of a discourse in its own right, by means of which we might be able to say something different from and other than what we can say in verbal form."<sup>4</sup> White was speaking specifically about the use of film and photographic images as sources for an alternative discourse in history. Petheo's images do not fall within those categories, but might nevertheless be understood as part of an alternative visual discourse of history, capable of "saying something different" about the past through a medium other than written prose.

Petheo's images are examples of what the graphic designer Edward Tufte calls "cognitive art."<sup>5</sup> Simply stated, cognitive art is a type of visual image designed to communicate information. Maps, engineering schematics, diagrams, airline departure tables, graphs, scientific illustrations, charts, EKG readouts, and the periodic table, to name but a few, are all examples of cognitive art. The art historian James Elkins labels these "informational images," a class of images in the wider domain of "nonart images."<sup>6</sup> Non art images, according to Elkins, make up by far the bulk of the images humans have

produced over the millennia, and Elkins finds these images as expressive as fine art images, and just as amenable to art historical analysis.

As the list above suggests, cognitive art and information images have long been a part of the representation of knowledge in scientific and technical disciplines. This tendency has been accelerated in recent years with the application of complex computer graphics to these disciplines. Scientists, mathematicians, and engineers use computer graphics to create images such as mathematical objects, computer-aided designs, virtual reality simulations, and abstract dataspace. These images are not distractions from the real scientific work; often, these images are the product of this work and are used for both data exploration and scholarly communication with professional colleagues. In the sciences, at least, cognitive art has long been regarded as a serious form of representation.

The present essay explores the possibilities of cognitive art images like Petheo's as serious forms of representation in history. When re-imagined as cognitive art, Bela Petheo's images appear not as "trivial and unhelpful" cartoons, but rather as serious and expressive forms of visual historical representation. Petheo's drawings were intended to depict synchronic structures, something like a visual *Annales* history. The properties inherent in visual representations prove especially useful to historians who wish to depict whole/part relationships, the multidimensional and simultaneous structures of world systems, or visual comparisons across space and time. Quite aside from being a forgotten and underappreciated event in the history of historiography, the McNeill/Petheo collaboration and the images produced suggest an interesting template for how historians might compose a visual history in today's computer-mediated environments. For reasons of cost and production, Petheo was limited to simple pen and ink drawings, but the form and structure of his diagrams provide a useful model for how we might build visual historical narratives on a digital canvas.

#### THE COLLABORATION

McNeill insisted that his text would include visual illustrations. While their purpose was, in part, to create a visual image of the written narrative as an aid to memory, the resulting images were more than mere visual aids

or supplemental illustrations of the words. The text, the photographs, and Petheo's images were "intended to support and mutually reinforce one another," McNeill wrote in the introduction. "In principle . . . an attentive perusal of any one of these three constituents of the work should offer its own limited yet coherent insight into the history of the human community, whereas the combination of all three is designed to multiply the force and enrich the meaning of any one taken by itself."<sup>7</sup> Although diminished when removed from the surrounding text, the illustrations nevertheless could stand on their own as representations of historical knowledge in visual—rather than verbal—form.

McNeill had interviewed and rejected five other illustrators before deciding on Petheo, a painter by training. The artist Harold Haydon had suggested Petheo to McNeill, who had decided that if Petheo failed to meet his criteria, then there would be no illustrations in the book. During their initial meeting, McNeill handed Petheo a list of the concepts he wished to have illustrated, then instructed Petheo to compose a few sketches. The drawing entitled "The Industrial Revolution" earned Petheo the handsome \$2000 commission to illustrate McNeill's text<sup>8</sup> (see Figure 1 at <http://www.bu.edu/historic/staley.html>).

McNeill originally conceived of the illustrations as abstract diagrams, with lines and geometric shapes enclosed around words. In his own work, McNeill would often sketch diagrammatic drawings of concepts either on paper or on blackboards as a way to clarify his own thinking. These diagrams were usually circles and shapes around words linked together by lines and arcs. The interesting, if visually simple, charts Carl Becker included in his 1931 *Modern History* textbook also inspired McNeill to include diagrammatic representations in his book.<sup>9</sup> Becker's charts were really little more than timelines, albeit timelines that employed the interesting narrative convention of bending the lines to show rising and falling actions.<sup>10</sup> McNeill seems to have imagined his diagrams as similar to the two-dimensional ones he often scribbled for himself, not simple one-dimensional timelines. The illustrations "Relations Among Old World Civilizations" and "The Rise of the West" are representative of the type of illustration McNeill had envisioned for *The Rise of the West*<sup>11</sup> (see Figure 2 at <http://www.bu.edu/historic/staley.html>).

Petheo, however, conceived of the illustrations as more figurative, wishing instead to draw realistic depictions of people and objects. Although the figures were to be realistic, Petheo believed that such figures were the best way to visualize abstract concepts. “When it comes to abstract ideas, such as the idea of ‘justice,’” Petheo wrote, “one has to resort to ‘symbols,’ i.e., images, where the meaning comes from common agreement, rather than direct communication.” Thus, the best way to visualize “justice” was with a blindfolded female figure holding a sword and scale.<sup>12</sup> Most of the symbols Petheo selected similarly derived from images readily accessible to anyone with an understanding of Western iconography. The concept of “imperial power,” for instance, was represented by an eagle, “industry” by a smoke stack, “fortuna” as the hand of a goddess measuring out the thread of life. Petheo was well trained in art history, and many of his choices reflect this understanding. Petheo’s drawings of Mesopotamian gods, for instance, appear similar to the visual conventions of that ancient civilization; in addition to costume, Petheo depicts the god in a seated position, a representation of his divine status (see Figure 3 at <http://www.bu.edu/historic/staley.html>). Petheo’s decision to employ realistic figures, therefore, was not for decorative effect but rather as a means of translating abstract concepts into visual form.

Given these two very different approaches, the two men debated which style would influence the design of the images. This debate was lively and never fully resolved, Petheo finding the abstract diagram idea too dry and “chemistry book-like,”<sup>13</sup> and McNeill believing that the idea of figurative drawings suffered from “too much realism.”<sup>14</sup> Eventually, the two settled on a compromise: the drawings would be based on the geometric diagrammatic style but would include figurative icons. Petheo would later refer to the resulting images as “animated charts.”<sup>15</sup>

The decision to create a hybrid image somewhere between an abstract diagram and a figurative drawing was a *de facto* decision. Although the two men worked closely in the early stages of the process, by the end Petheo worked alone. As noted before, McNeill produced a list of historical concepts he wished to have illustrated, such as “Growth of Civilization on Rainwatered Land” and “The Old Regime in Theory and Practice.” Petheo would read

the relevant sections of McNeill's text, then he and McNeill would meet to discuss the text, with McNeill explaining in words the main points of the section. Petheo then would "translate" the words into sketches. McNeill would offer his comments on the rough sketch, occasionally penciling his own preliminary drawings, which Petheo would then use to draw a second or third version. Drawing all the images took Petheo nearly two years, and was marked by disagreements between the two men over the issue of the figures Petheo increasingly employed in the images. McNeill criticized the figures at first, but appears to have eventually conceded to their inclusion, if only by gradually removing himself from the process.<sup>16</sup>

Petheo's increased role in the design of the images is visually evident, as the charts—which were composed in the order they appear in the book—became increasingly "animated," dominated by the figures. Compare, for instance, the use of figures in the image "Hammurabi's Great Society" with a later image such as "Japan 1500–1650" (see Figures 3 and 4 at <http://www.bu.edu/historic/staley.html>). In the first case, the figures assume rigid poses, with little in the way of gesture or movement. The diagrammatic nature of the illustration is evident. In the later illustration, however, the figures in the left side panel "move" and express emotion through gesture and body language. Increasingly, the illustrations rely more and more on such figures, as Petheo began to shed the overtly diagrammatic structure in favor of a more traditional pictorial space. The last image in the text, "Theory and Practice of Modern Dictatorship," is representative of this trend (see Figure 5 at <http://www.bu.edu/historic/staley.html>). The image is wholly figurative, with the figures alive with gesture and motion. The arrangement of the figures is based more on the realistic depiction of space rather than the abstract diagrammatic geometry that had informed most of the previous images. In my interviews with the artist, Petheo continually returned my attention to this image. In part this was because the image was personally meaningful to him, the artist having lived under such a dictatorial regime in his native Hungary. It is also clear that this illustration was the model for the type of image Petheo had envisioned all along and had wished for all of the illustrations in *The Rise of the West*.<sup>17</sup>

## REPRESENTING THE PAST THROUGH IMAGES

Like any written work of history, these animated charts are representations of the past, not the actual past itself. Hayden White reminded historians that any article or monograph we compose is “a verbal structure in the form of a narrative prose discourse that purports to be a model, or icon, of past structures and processes in the interest of *explaining what they were by representing them*.”<sup>18</sup> Working from this definition, White examined the formal structures of nineteenth-century historical works, noting how the form shaped the content of the history. My approach here is similar to White’s in that I treat Petheo’s images as visual structures in the form of a cognitive art discourse that purports to be a model of past structures in the interest of explaining what they were by representing them. Where White approached the written works from the perspective of literary theory, I am approaching Petheo’s images from the perspective of art history. I am less interested in the “correctness” of Petheo’s interpretation of the past than I am with the formal properties of the images. The larger goal of this inquiry is to understand how cognitive art images represent the past to serve as serious forms of historical discourse.

Images are an excellent medium for representing the past, in some cases a better medium than written prose. In an 1830 essay, Thomas Carlyle described the problems of writing about causation in history:

The most gifted man can observe, still more can record, only the *series* of his own impressions; his observation, therefore . . . must be *successive*, while the things done were often *simultaneous*; the things done were not in a series, but in a group. It is not in acted, as it is in written History: actual events are nowise so simply related to each other as parent and offspring are; every single event is the offspring not of one, but of all other events, prior or contemporaneous, and will in its turn combine with all others to give birth to new: it is an ever-living, ever-working Chaos of Being, wherein shape after shape bodies itself forth from innumerable elements. And this Chaos . . . is what the historian will depict, and scientifically gauge, we may say, by threading it with

single lines of a few els in length! For as all Action is, by nature, to be figured as extended in breadth and in depth, as well as in length . . . so all Narrative is, by its very nature, of only one dimension; only travels forward towards one, or towards successive points; Narrative is *linear*, Action is *solid*.<sup>19</sup>

Carlyle observed that the reality the historian wishes to represent is often multidimensional, simultaneous, and structural. When representing the past with written language, however, we are forced to condense this multidimensional world into a one-dimensional string of words, the “single lines of a few els in length,” as Carlyle poetically described it. This reduction in dimension similarly reduces the simultaneity of the structure so represented. With written language, we may only describe actions and events in a sequence, never simultaneously as they often occur. As the art historian Rudolf Arnheim observed, verbal language “dismantles the simultaneity of spatial structure.”<sup>20</sup> Historians well recognize that, as they are occurring, events do not line up in convenient successive order. Yet because we choose writing as our medium for serious representation in history, we are constrained to describe those events in such a linear order.

Historians in the twentieth century as well have lamented the limitations of prose for representing the past. Fredrick Lewis Allen “frankly confessed that if he could figure out a way to write several stories at once and construct them in parallel columns so some special human brain could follow all of the threads in the stories at the same time, then he might have a chance to help the reader sense the multiplicity, heterogeneity, and simultaneity of events.”<sup>21</sup> John D. Hicks similarly expresses his dissatisfaction with the linear treatment of historical narrative enabled by writing, especially when attempting to compose a textbook. “All historical writing,” he observes,

is a kind of compromise between topical and chronological treatment; how far should he go with one subject before he takes up another? And what sequence can he follow that will least confuse the students who so regularly assume that whatever comes earlier in the book happened before whatever comes later? And how can he guard against introducing a subject, following it halfway through, then dropping it

for chronological reasons and forgetting to return to it? Many times I have pointed out to my students how much simpler it would be if historical synthesis could follow the example of a symphony orchestra, with the various instruments, each representing some significant developments, all blended together to produce a harmonious whole. Instead, the historian has to do the best he can to convey his enormously complicated message on a single instrument that can produce only one tone at a time.<sup>22</sup>

That instrument, of course, is written prose. While admitting that writing cannot help but to dismantle the simultaneity and structure of the past, none of these historians composed their histories in a medium that could preserve simultaneity and structure. Each seems resigned to prose as their only medium of representation.

The act of composing a history through a medium other than prose is not without precedent, however. Using images to depict notable events is as old as human civilization. Kings and emperors have been commissioning paintings, monuments, and sculptures since the beginnings of settled society; one need only think of the Bayeux Tapestry, Trajan's column, Aztec pictorial histories, or the Egyptian Palette of Narmer to name only a few examples of representations of the past in visual form. This impulse to depict notable events extends to preliterate societies as well; some art historians maintain that cave paintings like those found at Lascaux and Altamira might well have been commemorations of especially successful hunts. We should situate Petheo's drawings within this ancient and fundamental historical impulse: to represent the past by picturing it.

Modern historians have largely suppressed this ancient impulse. As the discipline was professionalized toward the end of the nineteenth century, historians consigned images, such as historical paintings, to the ranks of amateur history or antiquarianism.<sup>23</sup> While historians are today becoming more comfortable with images as primary sources, most would never think of composing a visual secondary source.<sup>24</sup> Museum displays, historic recreations, and films are often designed for the general public or school kids. Professional historians value written history as the only form of serious history.

The reasons for this attitude are difficult to pin down, but may be linked to the notion that images are for the illiterate, a “dumbed down” version of the “real” information we believe is written. Medieval peasants needed stained glass images because they could not read the Latin words; little kids need lots of pictures in books before they can read the words; wayward students cut corners by watching the movie rather than reading the novel. The visual culture of television, movies—and today, the Internet—is often associated with popular mass culture, not serious academic discourse. The art educator Betty Edwards contends that such attitudes are enshrined in our educational institutions. Writing and mathematics—left-brain activities—dominate curricula, while art and image making—right-brain activities—are considered “enrichment” experiences that can be eliminated when budgets are tight.<sup>25</sup> While images might decorate our business presentations and textbooks, making them more entertaining and engaging than dry text, that text is still the carrier of the important information.

Contrary to the beliefs of modern historians, however, visual representations are not inferior to written representations. Many medieval scholars believed images were as useful as prose in constructing an argument, and in some cases were an even more useful form of discourse. Medieval theologians believed that thought, ideas, and concepts possessed underlying geometries, like tree diagrams, circles, and architectural forms. These geometric forms gave shape to thought, what the art historian Michael Evans calls the medieval “geometry of the mind.”<sup>26</sup> Medieval texts often contained geometric schemata which were not supplemental to the ideas expressed in words but were alternative forms of “diagrammatic exposition” (see Figure 6 at <http://www.bu.edu/historic/staley.html>). Indeed, for many medieval scholars, geometry was the most important of the liberal arts; for Hugh of St. Victor, geometry was the “fount of perceptions and the source of utterances.” Scholastic philosophers and theologians considered diagrammatic expositions to be as useful, rigorous, and necessary as prose expositions, and in fact of greater value in representing certain types of arguments. Geometric schemata could “express relations between a totality and its parts, between high and low, large and small, significant and insignificant, and do so in a more elegant and economical manner than words.”<sup>27</sup> While they

were often illustrations of text, just as often these diagrams were created without reference to a text; there are even examples of books of diagrams, composed without any accompanying text. Thus, argues one art historian, “it would be wrong to perceive [these] images as secondary illustrations to thoughts already formulated verbally. On the contrary, images reproduce the very structure of thought.”<sup>28</sup> Michael Evans believes these diagrammatic expositions represented “a sophisticated example of the tradition of visual exegesis through the medium of geometrical design.”<sup>29</sup> The illustrations in *The Rise of the West* might also be understood as a form of visual exegesis, diagrammatic arguments outside of what McNeill presented in the text.

Because they can depict simultaneity, multidimensionality, and whole/part relationships, images are an excellent medium for representing thought and ideas, including our representations of the past. Echoing Carlyle, the painter Donald Weismann observed that language “courses along like a train on a track or a river in its bed.” Language is a distinctive medium because of its discursiveness. “We say,” says Weismann, “that language is *discursive in form*. Its stimuli and the responses they elicit are strung out in time. We say, therefore, that language is *temporal in form*.” By contrast, a visual image is not discursive but “presentational,” since it reveals its whole structure to the eye at once. “Time,” notes Weismann, “is not required to gain the [form and logic] of the painting. Whereas the form of language is temporal, the form of the visual arts is *spatial*.”<sup>30</sup> When viewing an image, the eye wanders over the image. The eye grasps the whole, then “zooms into” a portion of the image to examine a smaller part. By seeing the whole, we can apprehend simultaneity; we can see many symbols in many relations to other symbols all at once. The eye can thereby readily draw visual comparisons between these symbols. These symbols need not line up like a chain of words but rather as a web; one could say, in fact, that the syntax of writing is a one-dimensional chain while the syntax of a visual image is a two- or three-dimensional web. It is the nonlinear syntax between symbols in a visual image that allows it to retain more of the simultaneity and multidimensionality Carlyle wished to represent, and which makes images especially useful in depicting structures.

Petheo’s diagrams aim for this presentational and spatial form. Look, for example, at the illustration “Russia Under Peter the Great” (see Figure 7 at

<http://www.bu.edu/historic/staley.html>). The eye can take in the image as a whole, and then can zoom into a smaller part of that whole, focusing on, for instance, the images representing Western influences (although the eye could be just as easily drawn to another portion of the image). We could extend our view further down and focus on one of the icons in particular, observing the clothing or other details before we zoom back out again to see the whole. Note what your eye is doing as you examine this image: unlike reading order, where the eye moves left-to-right in linear fashion following the train of words, the eye has no predetermined “viewing order” when viewing the image. Even as we focus on the icons for Western influence, we do not lose sight of their place within the larger whole, thereby allowing us to apprehend the relationship between whole and part. At the same time, we can place these icons in multidimensional relation to the other icons; we can see at a glance the geographical relationships of the Western icons to one another, their ultimate destinations once they arrive in Russia, and their symbolic relationships to the rest of Russian culture. The eye readily draws visual comparisons between the various icons depicted in the image. The presentational form of the image retains the structural relationships that are linearized in written prose.

Petheo’s animated charts function in a manner similar to a map. Historians, of course, appreciate the value of maps to our work, not as distracting decorations but as useful representations of historical knowledge. We unconsciously accept that certain types of knowledge—geographic information, for example—is multidimensional, simultaneous, structural, and nonlinear. Imagine trying to translate all of the information contained in a map into written prose form. Writing out such information would be, at best, clumsy and inefficient; at worst, too much information would be lost in the translation. These differences between the linearity of language and the spatiality of images have important consequences for how historians represent the past. As Carlyle, Allen, and Hicks observed, much of what historians study in the past is not linear and sequential, but rather nonlinear and simultaneous; yet we continue to insist that writing is a more serious form of representation than what can be pictured in images. Petheo’s cognitive art images are like maps, in that they locate historical concepts and information in

multidimensional, simultaneous, nonlinear structural form. When examined from this perspective, we might more readily grasp the useful communicative tasks cognitive art performs.

#### ICONOGRAPHIC TECHNIQUES

Each of the diagrams in *The Rise of the West* should be understood as the product of the creative tension between McNeill and Petheo. Recall that McNeill had imagined that the illustrations in the book would be abstract and geometric, while Petheo imagined them more as figurative pictures. Most of the images reflect a fusion of these two design assumptions: the geometric structure favored by McNeill provides the skeleton for each image, which is then filled out by Petheo's figurative icons. The results are images that are not quite like pictures and not quite like diagrams. They are, rather, "in-between" type images, "schemata," to employ Elkins's useful term. In his classification of nonart images, a schema is a type of image "that is strongly notational but also infused with . . . writing, pictures, framing elements, numbers, allographs, and so forth, with a high compliment of geometric forms."<sup>31</sup> By notational, Elkins means that the image is organized according to some geometric configuration; choreographic charts, graphs, and musical staves are all notational systems. Schemata are organized by a notational system that can be either overt and obvious or hidden and understood, but has the added dimension of pictures, words, numbers, or other symbols. The term "schemata" very nicely describes the images in *The Rise of the West*.

Indeed, there is a quality to Petheo's diagrams that seems medieval and pre-scientific, even nonWestern, all of which are evoked in the term "schemata." His illustrations are flat and two-dimensional, filled with symbols, signs, and figures whose position in the pictorial space often fail to obey the rules of linear perspective, like a mandala or a medieval book illustration. In many ways, they appear like the medieval "geometries of the mind" described above. Medieval schemata were unlike the schemata of antiquity—in that they were not based on an understanding of Euclid—nor were they like modern scientific diagrams, whose designers removed most of the symbols and figures, producing the "chemistry book-like" diagrams of today. While the figurative pictures of many medieval diagrams were present simply as

embellishments or as decorations, in many instances the figures would convey information that served as a necessary part of the visual argument.<sup>32</sup> Petheo's figures, as we have stated before and will elaborate below, always served this latter function, as a vital part of the overall narrative of the image. Because of his use of figurative images organized by a geometric form, Petheo's illustrations look more like medieval schemata than modern scientific diagrams.

During my interviews with the artist, I asked Petheo where he found his inspiration for the form of the diagrams. He pointed me toward Giotto's fresco *The Last Judgment* (c.1305) from the Arena chapel in Padua<sup>33</sup> (see Figure 8 at <http://www.bu.edu/historic/staley.html>). The figures in this fresco relate to each other in a manner similar to the diagrammatic space of medieval schemata. The Christ figure dominates the image; he is depicted much larger than his disciples, who line up on either side of him. Above, angels align themselves in rows like a chorus. They are depicted as smaller than the Christ figure, but this is not because they are located in the distance. Rather, Giotto uses scale to indicate significance and importance in the hierarchy. Position also determines importance in the hierarchy; these animated figures are arranged in a space that is geometric and schematic. Christ is placed at center, his disciples toward the middle. At lower left are the elect, and on the lower right are the damned as they descend toward hell. Note the smaller size of these latter two groups, again revealing their position in the hierarchy. In this image, higher and more centrally placed figures signify their importance. The geometry of the image is not as overt as with the examples shown above; we would need to imagine a framework of lines and shapes underlying these figurative images in order to more fully grasp their geometric form (see Figure 9 at <http://www.bu.edu/historic/staley.html>). Although the lines are not overt, the geometric order evident in medieval diagrammatic representations of thought is present in Giotto's fresco. This geometric spatial order had a direct influence on the final form of Petheo's images.

Because they are based largely on schematic geometry, Petheo's illustrations reflect a synchronic, rather than a diachronic, view of history. That is, the illustrations are not like Becker's timelines, which show a linear procession of specific events through time. Nor do they depict a single event,

like a historical painting of a notable battle or an important treaty signing (Petheo drew no images titled “Storming the Bastille” or “Signing the Magna Carta”). Instead, the images depict structures and relations, in a manner similar to an anthropological or Annales-type approach. In part, this design choice stemmed from McNeill’s original suggestions; the list he provided Petheo focused exclusively on structures rather than events. From this original mandate, Petheo then decided to depict these structures as Giotto-like geometric hierarchies.

If we were to focus on the geometric structures underlying many of Petheo’s images, we would more clearly see this hierarchical syntax. Removing the figurative icons in the image “Evolution of Chinese Society,” for instance, yields the following geometries (Figures 10 and 11 at <http://www.bu.edu/historic/staley.html>). In the image “Hammurabi’s Great Society,” this hierarchical theme is also present (Figures 3 and 12 at <http://www.bu.edu/historic/staley.html>). In both of these cases, more powerful figures are placed at the top, with weaker figures arranged below. This hierarchical structure is especially evident in many of the early illustrations in the text (since these tend to focus on the structure of various societies, which were, of course, hierarchical). This is not, however, the only geometric form Petheo employs. In some instances, the most important figure is not located at the top but nearer to the center, reminiscent of Giotto’s placement of the Christ figure in *The Last Judgment*. Consider, for example, the schematic geometry in the left-hand panel of the image “Japan: 1500–1650” (see Figures 4 and 13 at <http://www.bu.edu/historic/staley.html>). Petheo structured many of the later illustrations into more complex geometric configurations, in contrast to the simple hierarchies in the earlier diagrams. The geometry underlying each illustration is not inconsequential to the overall narrative of the image. Had Petheo chosen to arrange his figures as in a flow chart or in a circle, the result would have been a different narrative structure. The geometry of each illustration serves as the syntax of the image, the ordered arrangement of icons within the diagrammatic space.

The geometric structure forms the skeleton of each diagram; information-rich icons provide the flesh and muscle. At first glance, the icons may appear cartoonish and thus easily dismissed as childlike and irrelevant. Indeed,

Petheo says that the style of these figures was influenced by the nineteenth-century cartoonist Wilhelm Busch as well as by popular comic strips of the day such as *Dick Tracy*.<sup>34</sup> These icons seem to have been the particular target for the dismissive critiques of reviewers. However, we should not allow these critics' observations to cloud our understanding of the effective role the icons play in the overall structure of the image, nor should we view Petheo's icons simply as decorations intended to enliven the otherwise dull, geometric schematic. The icons are vital to the overall communicative effectiveness of the image because they depict meaningful information, information that would be impractical to convey through words alone.

Petheo composed icons that were context-dependent and meaningful. Look again at the image of Peter the Great (Figure 7 at <http://www.bu.edu/historic/staley.html>). Words alone, such as "czar" or "art" or "foreign ghetto," fail to convey the level of nuanced information the icons provide. Petheo's icons often displayed costumes and other aspects of the material culture of the period. The distinction between Peter's Western dress and more Orthodox robe is an integral part of the overall narrative of the diagram, as is his absence of facial hair when gazing westward. This one icon adds several levels of information that would require too many words to explain, thus making them impractical from a design perspective to include in the diagram.

In an effort to achieve a Giotto-like effect, Petheo uses icons of varying size to show hierarchical relationships. Petheo depicts the powerful, more important figures as much larger than all other figures, in violation of the rules of one-point perspective. In the same way the Christ figure dominates the Arena Chapel fresco, the shogun dominates the right hand panel of Petheo's image "Japan: 1500–1650" (Figure 4 at <http://www.bu.edu/historic/staley.html>). In that same image, the Japanese emperor is diminished in size, which reflects his diminishment in status and influence in the hierarchy. Petheo communicated historical information through the size and position of the figurative icons.

Petheo would often draw from contemporary visual conventions and iconography when designing these icons. Look, for example, at Petheo's depiction of the Mesopotamian gods (Figure 14 at <http://www.bu.edu/historic/staley.html>). In addition to depicting costume, the figure is seated,

as was the convention among artists from Mesopotamia as well as Egypt, Assyria, and Persia. The gods or other important figures were often drawn in seated positions, emphasizing their power and importance. This icon for gods is context-specific; in a later diagram for Greek civilization, the icon for the gods is drawn differently (Figure 15 at <http://www.bu.edu/historic/staley.html>). Where the Mesopotamian god holds a bolt and affects a threatening posture toward humanity, the Greek gods are relaxed and relatively indifferent to the human world below. Replacing these icons with the word “gods” for each diagram would not only remove important primary source information, it would ignore the cultural and historic differences in how those gods were viewed in each context. Petheo’s figures add several more dimensions of information to what would otherwise be a flat geometric rendering.

The human figures in the diagrams often convey information through gesture and body language. Petheo was influenced by the way Giotto’s figures conveyed narrative through their actions and gestures, as when the Christ figure indicates his acceptance of the elect with one hand and his rejection of the damned with the other.<sup>35</sup> Petheo’s figures—unlike the figures found in some medieval schemata—were not embellishments but vital carriers of meaning. Thus, Peter the Great smiles when facing westward, his hand gesturing his acceptance of Western art and technique; he scowls like an autocrat when facing eastward. The shogun banishes Western missionaries with an outstretched hand, his rigid stance calming the chaos that had previously engulfed the island. He both literally and figuratively “balances” samurai and urban elites. The samurai on the left greedily paw at Western weapons or engage in petty skirmishes, while their counterparts on the right are orderly and disciplined. The viewer must pay attention to the body language of each figure, for these figures often convey information necessary to interpret the overall narrative of the image, information that would otherwise require lengthy lines of prose. Although they are static images, Petheo’s figures are alive with expression, motion, and gesture. However, this nonverbal information is not intended to merely enliven (to make the past “come to life”) but rather to add meaningful information in service to the larger visual narrative.

Computer users are accustomed to clip-art filling their screens, and at first glance these figures would appear to look like low-tech precursors to those visual icons so prevalent in today's digital world. In fact, I can imagine a web designer looking at these diagrams and imagining them as templates for a type of multimedia history. A user might click onto any one of these figures as a navigation tool, in the same way we click onto images of printers and folders and disks on our computer's toolbar. The information designer Robert Horn sees clip-art as a vital component of the "visual language" that he maintains is defining twenty-first-century global communications.<sup>36</sup> Large and ever expanding clip-art databases allow designers to decorate their visualizations with ease.

I do not view Petheo's figures as similar to clip-art, and not simply because they are hand drawn versus computer generated. In the first place, Petheo's figures are context-dependant. Clip-art images are, by definition, generic and contextless, to make them easy to drop into one display after another. In the second place, the visual qualities of Petheo's figures matter a great deal in interpreting the overall narrative of the image. The viewer is required to look carefully at the figure, to pay attention to costume, gesture, size, location, iconography, convention, and level upon level of nonverbal communication. Clip-art images invite no such careful viewing; when clicking onto the symbol for "printer," the viewer need not pay special attention to the physical qualities of the icon. Petheo's icons are not simply a visual redundancy of the words: they add multiple dimensions of information beyond what is expressed in words.

In many instances Petheo employed fading and shading in his depiction of these icons. As with his other iconographic techniques, fading would serve a variety of narrative purposes and not simply as a decorative flourish. In some cases, faded images would reflect "the ideal" versus the harsh reality, drawn in black and white. The most notable example of this technique is shown in the image "Theory and Practice of Modern Dictatorship" (Figure 5 at <http://www.bu.edu/historic/staley.html>), where the ideal communist society is depicted at top, contrasted with the dark, ugly reality at bottom. Petheo would also use fading to show an activity or concept that had been placed in the background or that had been superseded, as in the case of the Japanese

emperor who, in addition to being reduced in size, is considerably faded. Petheo's figures often cast shadows, representative of the "light" emanating from a word or concept, as the Pharaoh in the first panel of "The Development of Monotheism" is bathed in the universal light of Aton (Figure 16 at <http://www.bu.edu/historic/staley.html>). Because these illustrations were to be simple black and white drawings, employing lighter shades of gray would allow Petheo to squeeze an extra layer of information into the image.

Although they are static images, Petheo's illustrations are indeed "animated," conveying historical information through word, symbol, gesture, and spatial arrangement. They contain no "chartjunk," a term coined by Edward Tufte to refer to unnecessary decoration or marks in an image that contain no data or information.<sup>37</sup> Tufte used the term chartjunk to describe poorly designed statistical graphics, but I believe the term can be applied to any type of image. Nearly every mark Petheo committed to paper, every gradation of shading, every arrangement of symbols and figures carries information, information necessary to establish the narrative structure of the whole. All the marks on the page contribute to the narrative, and are not present simply to decorate and make eye-catching, a fault of too many "graphics" today. A viewer casting a superficial glance at Petheo's illustrations would see only simple drawings, but such a glance would miss the levels upon levels of information contained in these well-composed, expressive visual narratives.

## CONCLUSIONS

McNeill himself often employed visual thinking in his own work, and specially commissioned and oversaw the composition of the diagrams for his text. Indeed, McNeill viewed their inclusion as a necessary part of the overall narrative. The McNeill/Petheo collaboration provides an example for how images might be included in the work of all historians, and offers a useful model for how images and words might work together in our scholarly publications and textbooks.

Such a collaboration would, I am convinced, improve the quality of visual images in educational materials. Education researchers and psychologists have argued for nearly two decades that some students learn better through

visual means than through linguistic means. Yet visual images in textbooks are rarely composed with the same attention to compositional style and meaningful content as the written words. As the critic Alexander Stille has correctly observed, too many of these “graphics” in school history textbooks are “distracting, boring and trivial, cutting down space for a more serious treatment of events.”<sup>38</sup> Textbook authors and teachers very rarely ask students to look at or study the graphics with the same seriousness with which they are asked to examine the written content. If we are truly to teach history to visual learners, historians should attend to the quality of the images in the same way we do the words. Images like those in *The Rise of the West* are meant to be looked at, contemplated, discussed, and remembered; advocates for visual learning in schools would do well to model Petheo’s iconographic strategies.

Students are not the only ones to benefit from well-designed cognitive art; historians’ scholarly work would be enhanced by more attention to images as secondary sources, as ways to display historical knowledge. When writing an article or monograph, historians might wish to design thoughtful images to visualize our arguments and interpretations in a more convincing manner. What the geographer Mark Monmonier has said about maps is equally applicable to cognitive art images:

Maps used in scholarly books and articles should not only support and supplement the author’s words, but should also convey a definite message. A good expository map is an integral and unambiguous part of the author’s narrative, adapted to the reader’s expectations and prior knowledge and designed to promote understanding, complement other illustrations, and build on what has gone before. Like good prose, an effective expository map requires careful thought and conscientious editing and rethinking. Because the expository map is a part of the author’s narrative, it is best designed while the author is making notes, writing, and rewriting. Indeed, writing with maps and with words should be a holistic process in which the author uses words and graphic symbols in concert and in combinations appropriate to the geographic character of the phenomenon discussed.<sup>39</sup>

Where Monmonier's expository maps depict geographic information, cognitive art images might be understood as expository "maps" of historical structures, with a definite message, communicative purpose, and interpretive stance. Cognitive art images used in scholarship should be the final result of an editing and revision process that has worked in parallel with the editing and revision of the text. Cognitive art should be included as a way to represent the past, to model ideas, and as a form of diagrammatic exposition.

Visual representations would be an especially helpful tool in representing the past. Historians are accustomed to using maps in their work, especially when trying to understand regional and super regional connections. World historians often deal with issues of structure and simultaneity, and with making comparisons across time and space. "Structural maps" like Petheo's could also help us to represent economic, political, and social structures in a manner that text alone cannot afford. Visual representations of relationships and structures would open up new areas of historiographic exploration.

Imagine something like Petheo's animated charts updated, enhanced, and digitized on a screen. Such a display would not be a textual document with pictorial illustrations; rather, the visualization itself would provide the structure and organization of the narrative. Imagine if the Peter the Great diagram were an interactive digital display that included not only the visual icons but also text, sound, and other multimedia elements. A viewer could navigate around in the resulting diagrammatic space, perhaps clicking onto the icon for Peter the Great, revealing a block of text or other such information. Clicking onto other elements of the diagram might reveal maps, tables, letters, government records, or other primary sources. The figures could also be animated, made to move in either geographic or diagrammatic space, their shifts in facial expression and body language conveying nuanced information, creating a truly "animated chart."

Petheo's diagrams remind us that such a digital visual history would need to attend to several important design elements. Space and structure would serve as organizing principles, as ways to give form to the narrative, in effect creating a spatial story. In the same way Petheo drew from Western iconography and the history of art, digitized artifacts and visual primary

sources could be placed within the narrative space. The diagrammatic structure would provide the main interface with the data as well as the overall narrative structure. This structure would be spatial and visual rather than linear and linguistic, maintaining the structure and simultaneity which historians like Hicks lament is lost when history is composed in purely written accounts. Petheo was limited to the relatively simple tools of pen, ink, and paper; historians employing Petheo's techniques in a digital space would have at their disposal a rich and expressive form of historical narrative, a digital geometry of mind.<sup>40</sup>

I am not arguing here that historians should abandon language and writing as a means to represent the past. I am arguing that images can convey serious information, and are an excellent medium for representing certain types of historical knowledge. Images can depict structures, dimensionality, and nonlinear simultaneous whole/part relationships in ways that written prose cannot always accomplish. Many of the events of the past that historians wish to represent unfolded in such a structural, nonlinear manner; it would be useful, therefore, to employ a medium of communication that retains many of these multidimensional, simultaneous features. Rather than ridiculing them, passing them over, or assuming that they are included merely to break up long blocks of text, historians might wish to consider more carefully cognitive art images such as Bela Petheo's as a serious form of discourse in history.

## NOTES

1. See especially the reviews by L. S. Stavrianos, *American Historical Review* LXIX, no. 3 (April 1964): 713–715; Joseph Strayer, *Journal of Modern History* 36 (June 1964): 184–185.
2. Hugh Trevor-Roper, "Barbarians Were Often at the Gate," *The New York Times Book Review* (October 6, 1963). Walter Kaufmann wrote that he "found some of the many charts dispensable." *Good Reading*, XV, no. 11 (January, 1964). Ernst B. Hass was even more vitriolic: "The book might have dispensed with a large number of comic-strip-like charts that purport to illustrate relationships between religious belief, social structure, and specific events. I found to the extent that they illustrate anything, they do more to distort the picture than to clarify it, apart from being an unnecessary cheapening of a serious and well-written text." *The Asian Student* (January 25, 1964). David Thomson wrote that "the drawings and diagrams too often fall between the stools of the obvious and the over-simple." *The Listener* (January 2, 1964).
3. See Chapter 1, "Prose and History," in David J. Staley, *Computers, Visualization and History: How New Technologies Will Transform Our Understanding of the Past* (Armonk, N.Y.: M.E. Sharpe, 2003).
4. Hayden White, "Historiography and Historiophoty," *American Historical Review*, 93, no. 5 (December 1988), 1193–1199.

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5. Edward Tufte, *Envisioning Information* (Cheshire, Connecticut: Graphics Press, 1990), 9.
6. James Elkins, *The Domain of Images* (Ithaca: Cornell University Press, 1999), 4.
7. William H. McNeill, *The Rise of the West: A History of the Human Community* (Chicago: The University of Chicago Press, 1963[1991]), xxxi–xxxii.
8. See Bela Petheo, “Creativity Versus Convention: An Illustrator’s Challenge,” *The Off-Campus Record* (St. John’s University, MN), 1967, 15–22; interview with Bela Petheo, August 22, 2001. Note: Neither McNeill nor Petheo have kept written records of their collaboration or the process by which the images were designed. Petheo’s article cited above is the only contemporary written account. Only a few of the original sketches remain (which are now in my personal collection). Because of the absence of written records, a good deal of the primary source research for this project derives from interviews with McNeill and Petheo.
9. William McNeill, personal correspondence, December 11, 2001.
10. Carl Becker, *Modern History: The Rise of a Democratic, Scientific, and Industrial Civilization* (New York: Silver Burdett, 1931).
11. William McNeill, personal correspondence, August 2, 2002.
12. Petheo, “Creativity Versus Convention,” 16.
13. *Ibid.*, 18. Interview with Bela Petheo, August 22, 2001.
14. *Ibid.* William McNeill, personal correspondence, December 11, 2001.
15. Petheo, “Creativity Versus Convention,” 19.
16. *Ibid.*, 15–22; interview with Bela Petheo, August 22, 2001; William McNeill, personal correspondences, April 26, 2002, July 12, 2002, August 2, 2002.
17. Interview with Bela Petheo, August 22, 2001; Bela Petheo, personal correspondence, April 28, 2002.
18. Hayden White, *Metahistory: The Historical Imagination in Nineteenth-Century Europe* (Baltimore: Johns Hopkins University Press, 1973), 2. Emphasis in original.
19. Thomas Carlyle, “On History,” in Fritz Stern, ed., *The Varieties of History: From Voltaire to the Present* (New York: Vintage Books, 1972), 95.
20. Rudolf Arnheim, *Visual Thinking* (Berkeley: University of California Press, 1969), 246.
21. Cited in Michael T. Isenberg, *Puzzles of the Past: An Introduction to Thinking About History* (College Station: Texas A&M University Press, 1985), 51.
22. John D. Hicks, *My Life with History: An Autobiography* (Lincoln: University of Nebraska Press, 1968), 166.
23. Francis Haskell, *History and its Images: Art and the Interpretation of the Past* (New Haven: Yale University Press, 1993), 1–2.
24. On the use of visual evidence as primary sources, see Peter Burke, *Eyewitnessing: The Uses of Images as Historical Evidence* (Ithaca: Cornell University Press, 2001); Raphael Samuel, *Theatres of Memory: vol 1, Past and Present in Contemporary Culture* (London: Verso, 1994).
25. See Betty Edwards, *Drawing on the Right Side of the Brain* (New York: Tarcher/Putnam, 1979 [1999]), 39–40; Rudolf Arnheim, *Thoughts on Art Education*, Occasional Paper 2 (The Getty Center for Education in the Arts, 1989); Kathryn Henderson, *On Line and On Paper: Visual Representations, Visual Culture, and Computer Graphics in Design Engineering* (Cambridge: MIT Press, 1999), vii.
26. Michael Evans, “The Geometry of the Mind,” *Architectural Association Quarterly*, 12, no. 4 (1980).
27. Kristin Bliksrud Aavitsland, “E.R. Curtius and the Rhetoric of Visual Art,” *Nordlit*, no. 6 [www.hum.uit.no/nordlit/6/aavitsland.html#.ftnref11](http://www.hum.uit.no/nordlit/6/aavitsland.html#.ftnref11), accessed July 19, 2002.
28. *Ibid.*
29. Evans, “The Geometry of the Mind,” 49.
30. Donald L. Weismann, *The Visual Arts as Human Experience* (Prentice-Hall, 1970), 10.
31. Elkins, *The Domain of Images*, 213.
32. Evans, “The Geometry of the Mind,” 35. “Some books,” writes Evans, “consisted entirely of diagrams, with no supporting text.”
33. Bela Petheo, personal correspondence, July 13, 2002.
34. Interview with Bela Petheo, August 22, 2001.
35. Bela Petheo, personal correspondence, July 13, 2002.

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36. See Robert Horn, *Visual Language: Global Communication for the 21st Century* (Bainbridge Island, Washington: MacroVu Press, 1998).
37. Edward Tufte, *The Visual Display of Quantitative Information* (Cheshire, CT: Graphics Press, 1983), 107.
38. Alexander Stille, "The Betrayal of History," *The New York Review of Books* (June 11, 1998), 15.
39. Mark Monmonier, *Mapping It Out: Expository Cartography for the Humanities and Social Sciences* (Chicago: University of Chicago Press, 1993), x–xi.
40. I explore the idea of visual historical narratives in *Computers, Visualization and History*.

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Images of The Rise of the West: Cognitive Art and Historical Representation. Article. Sep 2006.Â Reviews literature on the dual coding theory (DCT) of memory and cognition, beginning with the origin and development of DCT from 1963 to 1986. General and specific criticisms of DCT and research findings are also addressed, focusing on alternative views that emphasize abstract propositional representations as the basis of cognition. The review deals with the origins of DCT in research related to the conceptual peg hypothesis of concreteness and imagery effects on associative memory.