THE PLOT OF THE PLOT: GRAPHS AND VISUALIZATIONS

Clifford E. Wulfman

ABSTRACT

Data visualizations, particularly in the form of word maps and plotted graphs, have become a hallmark of the so-called "digital humanities." It is important for creators and readers of these depictions to remember that they are not "data" but readings, interpretations of data mediated by programmed algorithms and hermeneutic desires. More important for periodical studies than plots of nodes and edges is the immense graph of the so-called "Semantic Web," whose network of machine-actionable assertions could enable researchers to combine statements about magazines into rich interpretive maps.

KEYWORDS: *data visualization, data art, digital humanities, semantic web*

A map is a discrimination, a marking of difference. Does a map discover already-present traces, or does it make a primal, foundational mark?

In a famous passage near the end of *A Midsummer Night's Dream*, with order restored after the night's bewilderment, Theseus comments on the truth of apprehended things; comparing the imaginative powers of the lunatic, the lover, and the poet, he concludes

> *The poet's eye, in a fine frenzy rolling,*
> *Doth glance from heaven to earth, from earth to heaven;*

JOURNAL OF MODERN PERIODICAL STUDIES, Vol. 5, No. 1, 2014

And as imagination bodies forth
The forms of things unknown, the poet's pen
Turns them into shapes and gives to aery nothing
A local habitation and a name. (Act 5, Scene 1, 13–18)

Here Shakespeare articulates, in the voice of the play's figure of authority, the Renaissance conception of *poesis* as *inventio,* as discovery, and the way that conception might be read as a kind of mapping. Mapping is, in one (mathematical) sense, a set of directions: how to get from point A to point B, how to link a value in set A to a value in set B; how to take the form of things unknown bodying forth in the imagination and give them local habitation and a name. From heaven to earth; from unknown form to shape; from airy nothing to something real and nameable. In formal terms, then, the poetic imagination can be understood as a mapping function.

A mapping function both identifies and discriminates: the function identifies (a value x in set A with a value y in set B, for instance), while the result of a mapping function (the map itself) is the discriminating trace of the boundaries and borders discovered by the function—what is and is not B, for example.

Theseus makes the poet's imagination compact with that of the lover and the madman, who both, he says, make false maps by mis-seeing: thinking the object of his love is beautiful, for example, when she is not. We can describe a mapping function, and we can see the traces it produces, but a problem arises when we attempt to interpret the map—that is to say, when we come to read it. Here we must ask: is discrimination equivalent to de-scrim-ination? That is, is mapping a discovery, a lifting of a veil hiding a "true" border, or is it an interpretation, a reading, an imposition of lines on an otherwise unmarked territory, a reading that may be a misreading?

To pose such a question is to address the role of desire in map-making, the second thing to note about Shakespeare's figure of poetic imagination. The mapping of strong imagination is motivated and comprehensive: seeing (or wishing to see) some joy or fright, it manufactures a cause. Apprehension results in comprehension. But *apprehension* is a paradoxical term, for it means both to understand, to grasp the meaning of (*apprehend* derives from the Latin *ad prehendere,* to grasp, take, or seize), and also to anticipate, especially with anxiety, dread, or fear. Fears make bears out of bushes, and desire can spur strong imagination to wish-fulfillment.

This notion of *poesis* as discovery informs the aesthetics of data visualization, and those among us with strong imaginations would do well to apprehend it. In what follows I want to critique two "humanist" uses of data visualization as examples of a fundamental misreading of the concept of the graph, and conclude with a pointer, if not a map, to a more productive and valuable employment of that concept in the rational Athenian daylight.

MAPPING ART

Easy access to enormous quantities of raw data and the ready availability of inexpensive digital sensors have made possible a form of artistic expression called "data art," which draws data from some process or source and passes it through algorithmic filters in order to create an artwork that is functionally, and often dynamically, connected to its source. George Legrady's *Making Visible the Invisible*, commissioned in 2005 by the Seattle Public Library, will serve as an example. Here is how it works: The system receives, in real time, an XML-formatted list of circulation data directly from the library's information-management system. The data include the circulation timestamp and metadata about the material itself: Dewey subject classification codes, barcode information, titles, and associative keywords. Legrady's system then interprets the data by applying a suite of filtering programs and transformations to it, creating an hourly record of which words predominate by building a word-frequency index of titles and keywords, for example, or clustering checked-out items according to their Dewey categories. These abstractions are then used to create visualizations: four sequenced animations presented on six large LCD screens installed behind the library's main information desk (see figure 1).

FIG. 1 Two screens from George LeGrady's *Making the Invisible Visible* in the Seattle Public Library. Each screen displays two Dewey categories in three columns (books, CDs, DVDs); the titles spread across the image drop from the top and fade out to the bottom in an animation sequence. Image used with permission of the artist.

Legrady's system is essentially a semiotic machine: it does little more than create images of a kind of computational play of signification, visual renditions of the calculations and transformations Legrady's programs perform on the library data. As a kind of sensory apparatus (with its signal receivers, algorithmic filters, and output transmitters), it is a tool of the imagination, akin to the poet's rolling eye. Indeed, in an interview with Roberto Simanowski in *Dichtung Digital,* Legrady seems to echo Shakespeare's Theseus when he says of this work, "The process of visual mapping . . . allows the emergence of patterns which would not have been apparent otherwise. Things that are present, active, but have yet to be given a label, a name, or have yet to be pointed at."[1] Those patterns, according to Legrady, are airy nothings inherent in the library data: circulation trends in relation to the time of day and linguistic affinities among titles, among others.

The new-media theorist Lev Manovich, in "The Anti-Sublime Ideal in Data Art," says that, like the artists of the modernist period, "data visualisation artists transform the informational chaos of data packets moving through the network into clear and orderly forms."[2] The difference, for Manovich, comes in the multiplicity of local habitations digital mapping affords: because it enacts a three-stage series of transformations, from concrete data to abstract patterns, structures, and algorithms, and then back to concrete visualizations, mapping art carries the process of abstract art, which stops at the transformation of concrete data into abstract representations, one (dialectical) step further. Manovich's distinction allows us to see how Legrady departs from a purely semiotic view of this mapping. Legrady does not see visual mapping as an arbitrary linking of signifier to signified; instead, he says it reveals sets of linkages that are already inherent to the data produced by the library information system. But the linkages are *not* in the data. They are correspondences created by his algorithmic filters: mappings and tracing imposed on the data. It is not the data that are being visualized; it is the result of the filtering. That is, not the apprehension, but the comprehension.

Legrady elides primary data, drawn from logs and sensors, with processed information, and this conflation leads him, in the Simanowski interview, to make suspiciously large claims for his work. On the one hand, he says that the project's conception "was guided by the library's interest in having an artwork that reflected on the library as a system, and one of its key infrastructure components consists of the flow of data." Yet the project's intent, Legrady says, is "to provide a glimpse as to what the community is thinking based on the things they check out to take home with them." And the challenge of mapping art, he says, "is always to arrive at the ideal balance between information and poetics." Early versions of *Making Visible the Invisible* entailed visualizations that were much more abstract, but these, Legrady says, "evolved into more informational visualizations as it seemed necessary to bring in a certain degree of legibility." For Legrady, the most fascinating element of mapping art is "the cultural narrative and associative resonances that emerge out of the stream of data itself, so it is best to let it speak for itself."[3]

But the data stream most emphatically cannot speak for itself. It must be articulated by another—in this case, by a two-fold agency of processing and presentation that selects what data to use, how to relate them, and how to express the relationships. It is Legrady who chooses to write a program that orders checked-out titles by subject, and Legrady who chooses to indicate their rank by, for example, displaying those titles in a larger font. Legrady's project is not, therefore, semiotic so much as it is mimetic, and as such is not a mathematical mapping or projection but rather an imitation of a process of perception and interpretation pretending to be a mapping. To see *Making Visible the Invisible* as providing a map of "what the community is thinking" is a wishful fantasy, akin to mistaking a bush for a bear.

I say "wishful" because I want to emphasize the element of intention and desire in Legrady's conception. Why should Legrady want to say that his art provides a map of community thought? And why should he want to claim that his art is merely representational, a transparent vessel through which the data stream speaks for itself?

Legrady's desire is a manifestation of what Shakespeare calls the poet's "strong imagination," and in this context we must take seriously Shakespeare's compaction of the poet's imagination with the misapprehensions of the lunatic and the lover. All three derive from the map-making urge that is fundamental to human consciousness. We are semiotic subjects, impelled to invent meaning, whether we believe we are discovering significance inherent in the objects of perception (the data) or in the unconscious processes of our minds. Legrady wants his art to function as a kind of social barometer installed in the public square, a mirror that reveals the community's desires and obsessions to itself.

It is part and parcel, too, of our aesthetic urge, our impulse to evaluate or measure the value of a work of art. Specifically, as critics, how do we evaluate, or measure, the aesthetic value of a piece of mapping art? Do we assess its traditional qualities—color, shape, form? Do we measure its *fidelity,* in some way: the degree to which, as a map, it conforms to or represents the contours and complexities (or lack thereof) of its underlying data? Do we take a reading of its literariness—the degree to which it defamiliarizes and therefore broadens the semiotic field? At play here are two notions of mapping: the idea of functional mapping (that is, the work of art is a function F that, for each and every element or subset of some data set A yields some element or subset in domain B), and the idea of semiotic modeling, in which the work of art is a kind of semiotic field/space—that is to say, a language—of signs whose signifiers are the perceptible phenomena produced by the work, and the signifieds are the underlying data.

MORETTI AND THE MECHANIC MUSE

On June 26, 2011, the *New York Times* introduced a new feature devoted to examining the exploding "techno-literary complex" of writers, publishers, and scholars: the territory of the digital humanities. The editors titled the column "The Mechanic Muse," after Hugh Kenner's 1987 book of the same name, and they noted approvingly Kenner's personal enthusiasm for technology and his critical understanding of the "close kinship of modernist writers with the technologies of their time."[4] Nevertheless, the feature's first column, the *New York Times*'s inaugural engagement with digital humanities, was a curiously hostile piece by Kathryn Schulz entitled "What Is Distant Reading?" that took aim at the quantitative methods of the Stanford Literary Lab and its founder, literary scholar Franco Moretti.

Moretti's writings (particularly his "Conjectures on World Literature" and *Graphs, Maps, Trees*) have become foundational texts for statistics-driven literary study and a method of "distant reading" that foregoes the semantic parsing of individual texts by individual readers for the statistical accounting of large text corpora by programs.[5] Advocates of this approach criticize traditionally New Critical approaches to literary criticism for drawing insupportably broad conclusions from a small canon of texts (not, of course, a new critique) and argue instead for approaches that draw on extremely large corpora of text—whole runs of journals, for example, or, hypothetically, the entirety of nineteenth-century printed text.[6] Because it is impossible for individuals to "read" everything in a corpus of that size, advocates of distant reading employ computational techniques to "mine" the texts for significant patterns and then use statistical analysis to make statements about those patterns.

Although her article is entitled "What Is Distant Reading?" Schulz does not actually critique corpus analysis. Instead, she focuses on another quantitative method Moretti and the Stanford Lab employ, the application of network theory to the analysis of plot. It is this critique that concerns us here, as Schulz takes particular aim at Moretti's "Network Theory, Plot Analysis," a paper published in *New Left Review* in 2011 and in expanded form as a "pamphlet" on the Stanford Literary Lab's website. It was a discussion of this pamphlet by an "Essay Club" hosted by the Magazine Modernisms blog in the summer of 2011 that led to this special issue of *JMPS*.[7]

Schulz notes that Moretti adheres to the scientific method in "publishing negative results" by confessing that over the course of his attempt to use network theory to study the plot of *Hamlet,* he "drifted from quantification to the qualitative analysis of plot." But the "negative result" Moretti reports is not a failure of quantification but rather the limits of contemporary software: "Once I started working in earnest," Moretti writes, "I soon realized that the machine-gathering of the data, essential to large-scale quantification, was not yet a realistic possibility."[8] That is, he was unable to construct networks of sufficient size to support statistical analysis. So he "repurposed" the network he had constructed and used it to support a "qualitative analysis" of plot that entailed a spatial reinterpretation of temporal structure.

Moretti cheerfully acknowledges that he is a *bricoleur* with limited understanding of the bits and pieces he picks up and plays with. But it is important to engage Moretti fully in that play and to recognize (even if, on several occasions, it appears he himself does not) that the mistake is not one of quantification but of interpretation, in the Shakespearean sense we have just described. In a section entitled "Epilogue," Moretti reflects on the work he has just described as a journey of discovery, one that entailed two major changes in direction: first, from the quantification of plot by means of network theory to a "qualitative analysis of plot" based on relational rather than temporal concepts, and then a second, "more radical" change to a metaphoric conceptualization driven by his apprehension of spatial patterns in the graphs. "No," Moretti concludes, "I did not need network *theory,* but I probably needed *networks*. . . . What I took from network theory were less concepts than *visualization:* the possibility of extracting characters and interactions from a dramatic structure, and turning them into a set of signs that I could see at a glance, in a two-dimensional space."[9] Moretti, I think, commits a category error here. By "network theory," he seems to mean the abstract model conceptualized by nodes and edges—the subject of decades' worth of mathematical research. And by "networks," he clearly means the drawings of circles and curved lines that enabled him to understand something new about the play. But the drawing is not the network. It is simply one depiction—one of infinitely many possible depictions—of the assertions represented by the graph. Network *theory* is a language; a particular network is a set of statements in that language; and the drawing—what Moretti calls the network—is an expression of the statements. Or to use the common terminology for depicting graphs, a *plot*. To emend Moretti's conclusion, he did not need the graph, but he probably needed the plot of the graph.

In other words (and they are probably not words Moretti would use), he reified the trope of (narrative) plot as (graphical) plot by attempting to map a temporal structure (the plot of *Hamlet)* into two-dimensional space (the plot of the graph). And his "pamphlet" is not a lab report (though it borrows from that genre) so much as it is a narrative, a narrative of trial and investigation that led, Moretti says, to the next chapter in the Stanford Literary Lab's work. That is, it is less an essay than a plotting of a plot to plot.

And it is a plot that fails. Moretti appends an epilogue to his epilogue: some time after the *Hamlet* experiment, the Stanford Literary Lab attempted to graph the utterance relationships in all of Shakespeare's plays. Despite the application of numerous tweaks "to maximize our chances of 'seeing' the complex dramatic structures we wanted to understand," the team was unable to produce a plot that was legible, one that made the structures comprehensible to the faculty Moretti calls "intuition." "It is never easy," Moretti concludes, "realizing that one has reached a dead end, pure and simple. But this is what it was."[10]

It is not quite so simple, though. There are two possible reasons why the plots are illegible, having to do with the agents involved. The first is that Moretti and his team may not be terribly good readers of plots (the graphic kind). A naïve reliance on visual "intuition" seldom holds up to rigorous application; intuition usually needs to be refined and enhanced with tuition (training, study, practice): ask an electrical engineer, or a radiologist, or an art historian. Certain illustrative conventions—circles connected by lines or clustered together, for example—offer a false perspicuity precisely because they are so conventional. When we look at Gephi's lovely constellations we believe we are seeing more than we are. The power of visualization is its capacity to represent abstract properties and relationships. That is, they are complex signs, whose properties—shape, size, color, placement—can be exploited to stand in for other things. The diameter of a circle can be made to denote something, as can its color and location; so too can the length of a line, its weight, the presence of arrowheads on its terminal points. This is what visualization does: it exploits the properties of graphical elements to convey meaning. In other words, visualizations are metaphors.

The second reason is this: Graphviz (or any tool like it) is not Shakespeare. The programs that draw plots are like the poet's pen, turning the forms of things unknown into shapes. Projecting graphs into two dimensions is a hard problem, the subject of considerable research in mathematics and computer science. These mechanic poets rely on algorithms that compute the two-dimensional coordinates of characters and lines (the signifiers of the graph's nodes and edges) based on rules, formulas, constraints, and tolerances. The plot, in other words, is driven by algorithms that function like the Freudian dreamwork to overlay, censor, and combine the images from the Unconscious: desire (to comprehend the network, to conceptualize the relational data) governing the tracing of its significations.

CECI N'EST PAS UN GRAPHE

Recently, the Modernist Journals Project opened an "MJP Labs" subsite.[11] It contains some dazzling and thought-provoking visualizations, like one representing the relative number of contributions made to *Others* by its authors (see figure 2). It is an intriguing image, but more important than these sample visualizations are the underlying representations the MJP has begun to make available, the XML-encoded metadata records that underlie these visualizations and that drive the MJP site itself. By making these records available, the MJP has empowered researchers to perform their own analyses using the increasingly broad array of tools available to them.

Figure 3 is part of one of these complex bibliographic records, expressed using a schema (a language) called MODS. MODS is one attempt by the library community to represent centuries' worth of bibliographic data in human-readable, machine-processable XML. It is a useful attempt, but there are a number of things wrong with it.

First, it is anachronistic, because it perpetuates a records-based data-processing model rooted in paper and punch cards. Records are a fine method for storing important information in one place, but they do little to expose the relationship of the data in a record's fields to other records: you can easily see all the data about a particular student, for example, but not the rank of all the students in a class. Databases help bring disparate records together, making it possible to find all records of poems written by Ezra Pound, for example, or "created" by "Pound, Ezra"—which is not quite the same thing. A human reader can readily interpret the string "P o u n d, E z r a" as referring to Ezra Pound, the American poet. To a machine,

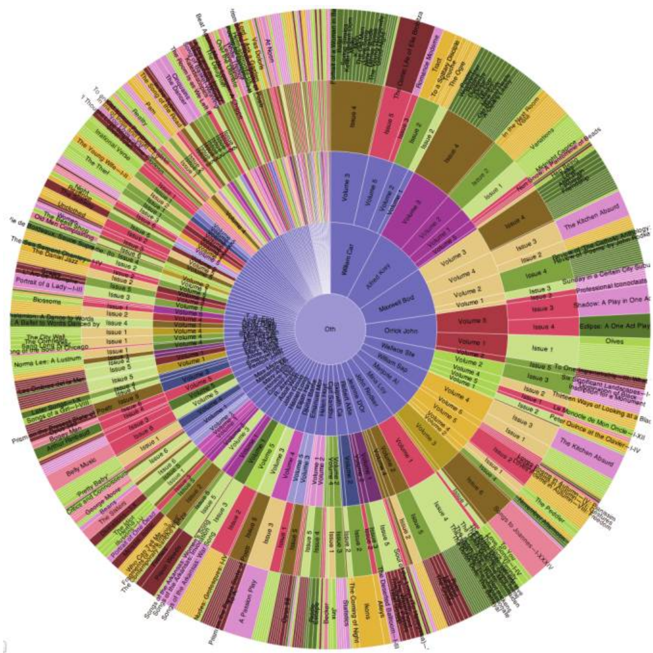

FIG. 2 A visualization from the “MJP Labs” portion of the Modernist Journals Project’s website. The wheel represents the relative number of contributions made to the magazine *Others* by its contributors.

```
<relatedItem type=“constituent”>
 <titleInfo>
  <nonSort>The</nonSort>
  <title>Tea Shop</title>
 </titleInfo>
 <name type=“personal”>
  <namePart>Pound, Ezra</namePart>
  <role>
   <roleTerm authority=“marcrelator” type=“text”>creator</roleTerm>
  </role>
 </name>
 <genre authority=“aat”>poetry</genre>
 <part>
  <extent unit=“pages”>
   <start>84</start>
   <end>84</end>
  </extent>
 </part>
</relatedItem>
```

FIG. 3 A portion of descriptive metadata encoded in the Metadata Object Description Schema (MODS). MODS is an XML schema for representing bibliographic elements; it is maintained by the Network Development and MARC Standards Office of the Library of Congress.

however, it is merely a string, an empty signifier, used to designate a part of a personal name playing the role of "c r e a t o r" in this record. Simple string matching will not reveal that "Pound, Ezra" refers to the same person as "Ezra Pound," or "William Aetheling," or any of the other aliases under which Ezra Weston Loomis Pound wrote. What is needed is a general purpose identifier, a true sign, to which all the strings can refer. Librarians have been creating such "name authorities" for some time, (as well as authorities for authorial roles like "creator") but these have until recently been little more than concordances for catalogers.

What this old-fashioned computer technology lacks is a way of bringing caches of information together. Periodical studies has emerged as a discipline that examines magazines both synchronically and diachronically, and its success is predicated on the ability of researchers to trace the work of writers, artists, editors, and advertisers across time and space. It has taken the creation of the Internet and the evolution of the World Wide Web to make that possible—and conventions for linking data together in consistently meaningful ways. Such a set of conventions has begun to emerge in the Semantic Web, which is without question the most important graph for the study of magazines.

The Semantic Web is made up of formally encoded statements asserting relationships (predicates) between things (subjects and objects), residing in discoverable and addressable locations across the World Wide Web.

Let us look at a record for the "Dada Manifesto of 1918," published in the third issue of *Dada* and encoded by the Blue Mountain Project (see figure 4). Notice a few things about this representation. First, it contains unique identifiers for both the record and the resources it describes. These make it possible for people and programs to refer unambiguously to *Dada 3* (urn:PUL:bluemountain:bmtnaae_1918-12_01) and to the Dada Manifesto for which it is so famous (urn:PUL:bluemountain:bmtnaae_1918-12_01#c1). Similarly, the byline to the Manifesto (TRISTAN TZARA) is recorded, but that is not the name of the Romanian poet; he is named http://viaf.org/viaf/27072443 instead: a name opaque to human readers but *actionable* by machines, which can follow the URL to the Virtual International Authority File, to which any web resource can refer when wanting to indicate it is talking about this Tristan Tzara and no other. Even the relationship of http://viaf.org/viaf/27072443 to urn:PUL:bluemountain:bmtnaae_1918-12_01#c1 is expressed unambiguously by reference to a commonly understood predicate identified by http://id.loc.gov/vocabulary/relators/cre.

```
<mods xmlns=“http://www.loc.gov/mods/v3”>
 <recordInfo>
  <recordIdentifier>urn:PUL:bluemountain:dmd:bmtnaae_1918_01
  </recordIdentifier>
 </recordInfo>
 <identifier type=“bmtn”>urn:PUL:bluemountain:bmtnaae_1918_01
 </identifier>
 <typeOf Resource>text</typeOfResource>
 <genre>Periodicals-Issue</genre>
 <titleInfo type=“uniform”>
  <title>Dada (Zurich, Switzerland)</title>
 </titleInfo>
 <titleInfo>
  <title>Dada 3</title>
 </titleInfo>
 <part type=“issue”>
  <detail type=“number”>
   <number>3</number>
   <caption>3</caption>
  </detail>
  <extent unit=“pages”>
   <list>15</list>
  </extent>
  <extent unit=“pageimages”>
   <total>16</total>
  </extent>
 </part>
 <originInfo>
  <dateIssued>Décembre 1918</dateIssued>
  <dateIssued keyDate=“yes” encoding=“w3cdtf”>1918-12</dateIssued>
 </originInfo>
 <relatedItem type=“host” xlink:type=“simple”
             xlink:href=“urn:PUL:bluemountain:bmtnaae”>
  <recordInfo>
   <recordIdentifier>urn:PUL:bluemountain:dmd:bmtnaae
   </recordIdentifier>
  </recordInfo>
 </relatedItem>
 <relatedItem type=“constituent” ID=“c1”>
  <titleInfo lang=“fre”>
   <title>Manifeste Dada 1918</title>
  </titleInfo>
  <name type=“personal” authority=“viaf” valueURI=“http://viaf.org/27072443”>
   <displayForm>Tristan Tzara</displayForm>
   <role>
         <roleTerm type=“code” authority=“marcrelator”>cre</roleTerm>
   </role>
  </name>
  <typeOfResource>text</typeOfResource>
  <language>
   <languageTerm authority=“iso639-2b”>fre</languageTerm>
  </language>
 </relatedItem>
</mods>
```


FIG. 4 A MODS record for the Dada Manifesto of 1918, appearing in the third issue of *Dada*.

The MODS record has now been enhanced to emphasize unambiguous things and the unambiguous relationships among them. These relationships can be distilled and expressed more succinctly in a series of statements in first-order predicate logic:

The title of work_x is 'Manifeste Dada 1918'
The creator of work_x is 'Tristan Tzara'
Work_x is part of 'Dada 3'

Or, more formally, as a set of subject-predicate-object triples (see table 1).

TABLE. 1 Statements about the Dada Manifesto, expressed as subject-predicate-object triples.

Subject	**Predicate**	**Object**
work_x	title-of	'Manifeste Dada 1918'
work_x	creator-of	'Tristan Tzara'
work_x	part-of	'Dada 3'

In fact, with a bit more syntactic sugar we can express these relationships in machine-readable form, as in figure 5, which makes the same statements using the Resource Description Framework (RDF), a widely adopted method for conceptual description. This is only one of several for mats developed to express RDF triples (a format called Turtle); the same triples can be written using the syntax of XML, or expressed visually, as in figure 6. RDF expresses the relationships in a way that ties the subjects, objects, and predicates unambiguously to other concepts addressable on the World Wide Web.

That is to say, it situates our graph within the immense graph of the Semantic Web. It is unambiguous but not closed or unique: there is nothing preventing another from asserting more specific roles for Tzara in the composition and publication of "Manifeste Dada 1918," using other vocabularies and augmenting a universally accessible web of meaning.

While powerful in its unbounded extensibility, this "linked data" model suffers from a problem opposite that of fixed data records like MODS: because statements can be made in any language, anyone can make up their own predicates to express concepts and assertions, even if synonymous terms are already in circulation. This flexibility is a great advantage when expressing subtle differences in meaning but a hindrance when trying to communicate commonly accepted notions with generally understood terms. To avoid this problem, informaticists frequently codify the semantics of a domain of discourse—the vocabularies and the relationships among the concepts they represent—into formal ontologies, which may then be shared among communicants.

```
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix dc: <http://purl.org/dc/elements/1.1/> .
@prefix dct: <http://purl.org/dc/terms/> .
@prefix bmtn: <urn:PUL:bluemountain> .
@prefix owl: <http://www.w3.org/2002/07/owl#> .

bmtn:bmtnaae_1918_01#c1 dc:title "Manifeste Dada 1918" ;
                        dct:creator [
                          rdfs:label "Tristan Tzara" ;
                          owl:sameAs <http://viaf.org/viaf/27072443>
                        ] ;
                        dct:isPartOf <bmtn:bmtnaae_1918-12_01> .
```

FIG. 5 Statements about the Dada Manifesto representated as a graph of RDF triplets in the Turtle format.

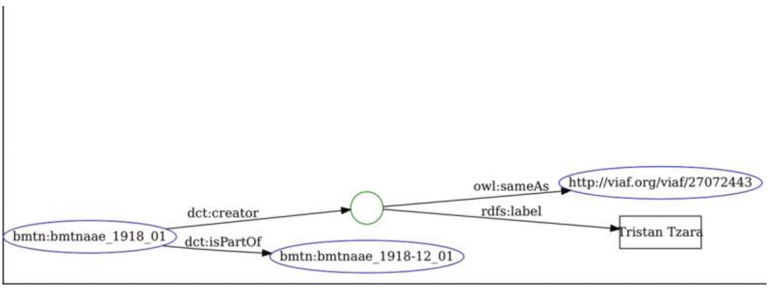

FIG. 6 A visual diagram representing the graph of RDF triples in figure 5 as a set of nodes connected by directed arcs.

To date, the digital library community has developed a number of ontologies for books, newspapers, and academic journals. Some are simple translations of old-fashioned bibliographic records,[12] while others are attempts to express bibliographic concepts more generally.[13] In the past several years, a group of information scientists and librarians have begun to develop more-sophisticated models for publication; of particular interest is an ontology called PRESSOO, an extension of an ontology for describing museum collections that models bibliographic information pertaining to journals and magazines.[14] Figure 7 shows an exploratory modeling of the publication of Bayard Boyesen's "Lake" in the first issue of *Broom* and its subsequent digitization by the Blue Mountain Project. More than visualization, it is this work—the work of developing an ontology that enables researchers to make rich statements about magazines, their form, their content, and their relationships to the world, and then the work of producing those statements—that offers a fruitful application of graph theory to periodical studies.

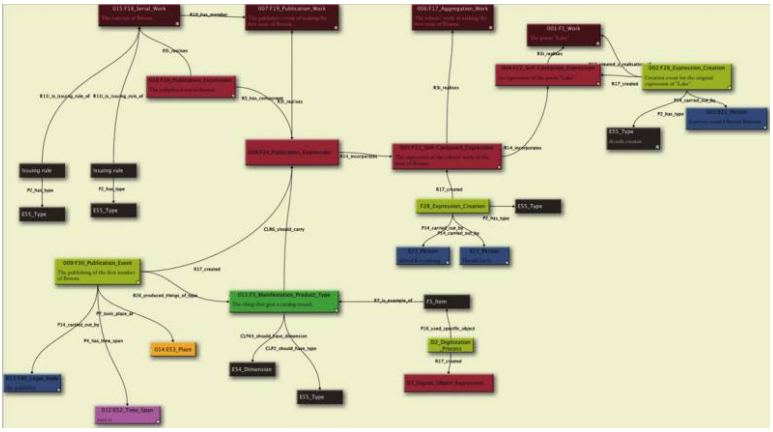

FIG. 7 A graph modeling the publication of Bayard Boyesen's "Lake" in the first issue of *Broom*, using the PRESSOO ontology.

As the as-yet-ill-defined "digital humanities" begin to take shape and use data visualization to give new habitations and names to the products of frenzied scholarly brains, it is important for us, as critics, to scrutinize those practices with care and suspicion. Quantitative methods promise to reveal much that has been invisible until now, but much, too, can be revealed about critical desire. What is the map of the digital humanities? What are its borders and disputed territories? In our eagerness to make it new, to ask questions we have never been able to answer before, we should not simplify our methods or abandon the self-reflection that is a hallmark of humanistic inquiry. The digital humanities must be a "discipline" (if at all) that critiques its methods. We must continue, as Peter Brooks urges us, to read for the plot, to look back and see what lines have been traced, what map has been made, by the desire to make a map.

NOTES

1. Roberto Simanowski, "The Art of Mapping Statistics: Interview with George Legrady," *Dichtung Digital* 7, no. 35 (2005): http://www.dichtung-digital.de/2005/2-Legrady.htm.
2. Lev Manovich, "The Anti-Sublime Ideal in Data Art," August 2002, available at http://users.fba.up.pt/~ldcag01015/anti_sublime/beauty.html.
3. Simanowski, "Art of Mapping Statistics."
4. "Up Front: Introducing the Mechanic Muse," *New York Times*, June 26, 2011.
5. Franco Moretti, "Conjectures on World Literature," *New Left Review* 1 (2000): 54-68; Franco Moretti, *Graphs, Maps, Trees: Abstract Models for a Literary History* (London: Verso Books, 2005).
6. Hypothetically, because not all nineteenth-century texts have been converted to machine-readable form, despite the prodigious efforts of Google and other mass digitizers.
7. Kathryn Schulz, "What Is Distant Reading?," *New York Times*, June 26, 2011; Franco Moretti, "Network Theory, Plot Analysis," *Stanford Literary Lab Pamphlet* 2 (2011): http://litlab.stanford.edu/; James Stephen Murphy, "MagMods Essay Club: Franco Moretti and the Prospects of Social Network Analysis for Literary Studies," Magazine Modernisms: Dedicated to Modern Periodical Studies blog, August 18, 2011, http://magmods.wordpress.com/2011/08/18/magmods-essay-club-moretti-and-the-prospects-of-social-network-analysis-for-literayr-studies/.
8. Moretti, "Network Theory," 11.
9. Ibid.
10. Ibid., 12.
11. The author is the former Project Manager and now Technical Director of the Modernist Journals Project at Brown University.
12. See, for example, Diane Hillman, Karen Coyle, Jon Phipps, and Gordon Dunsire, "RDA Vocabularies: Process, Outcome, Use" *D-Lib Magazine* 16, nos. 1/2 (2010): http://webdoc.sub.gwdg.de/edoc/aw/d-lib/dlib/january10/hillmann/01hillmann.print.html.
13. See, for example, the Bibliographic Ontology (BIBO): http://bibliontology.com/, and the Bibliographic Framework Initiative (http://bibframe.org).
14. See The CIDOC Conceptual Reference Model website, http://www.cidoc-crm.org/; Patrick Le Boeuf, "A Strange Model Named FRBRoo," *Cataloging and Classification Quarterly* 50, no. 5–7 (2012): 422–38, doi:10.1080/01639374.2012.679222; and Patrick Le Boeuf, "PRESSoo Version 0.2," December 2013, http://www.issn.org/wp-content/uploads/2013/12/PRESSoo_02.pdf.