UNEDITED, UNCORRECTED PRE-PUBLICATION DRAFT
Edited and published as "Shakespeare as Network," in Shakespeare and Textual Studies, ed. Margaret Jane Kidnie and Sonia Massai (Cambridge: Cambridge University Press, 2016), pp. 398-414.

Shakespeare as Network

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June 6, 2013

Our understanding of the role and nature of Shakespeare scholarship made perfect sense in the Age of Paper. But in the Age of the Internet, Shakespeare and scholarship are becoming networks. We may not like this, but we should understand it. And then we should like it.

We should also be adjusting how we do scholarship and how we convey the fruits of that scholarship to take advantage of this radically new medium.

In the traditional paper-based model, modern scholarship and Shakespeare's own work shared an essential property: they were conceived as forms of publishing. Shakespeare worked on his manuscripts privately until they were ready to be shown to the small public of his acting troupe,

and then finally to the broad public in performances. Likewise for traditional scholarship. The scholar works in private, whether that is the privacy of a personal study or the slightly larger circle of trusted early readers and auditors. Once the scholar judges her article to be ready, she submits it to a journal where it is reviewed and winnowed. The scholarly paper is done, settled, and close to irrevocable…as unchangeable as the ink that has settled into paper.

That is not a casual simile. As many have observed, albeit none as pithily as Marshall McLuhan, a medium shapes its content. We need not afford the medium any mystical powers to explain this. Rather, media come with certain things they do better or more easily than other things. Drop that set of affordances into a culture, and the content takes on a particular topology, which in turn affects the culture's understanding of the field the content inhabits. The medium is far from being the sole determinant of the content and the discipline, but it is highly influential. The mechanics of this are as complex as any topic in history, especially since the process is far from mechanical. It is better understood as an emergent phenomenon, that is, as a determined result that is nevertheless unpredictable because of the complexity of the mix of factors, which in this case include the physical properties of paper, the economics of publishing, the requirements for building a career as an academic, the self-understanding of significant institutions, the personalities and strivings of individual scholars, and the occasional fluttering of butterfly wings. (And if I were writing this for a hyperlinked medium, I would link that last phrase to a source about chaos theory's "butterfly effect.")

Scholarship and even knowledge itself have fit themselves to the affordances of paper. Knowledge, once determined, is as settled as inked dried into paper. Topics have miraculously turned out to be the size of a book. One becomes accredited as an expert using the same techniques by which manuscripts are selected for print, with having been published counting as a powerful credit toward that accreditation. The system of knowledge over all gained its efficiency from being a set of stopping points — backed by authority and credentials — that allow us to get answers and move on. Knowledge thereby reflects one of paper's most irksome limitations: each book is physically disconnected from every other.

Now, as the Internet becomes the medium of knowledge, it should come as no surprise knowledge, knowing, and knowers are also changing. What we construed along the lines of publishing we now are beginning to understand within the frame of networks. Indeed, there is some literal sense in saying that whereas Shakespeare used to look like a writer and his works used to look like publications, now Shakespeare and his works are showing themselves to us as networks.

This presents a tremendous opportunity for advancing our scholarly understanding of Shakespeare. This in turn should change not only how we read Shakespeare, but how we prepare materials about Shakespeare. The network view is also, I will argue, closer to the truth about Shakespeare, his works, and what it means to understand them.

Networked scholarship

If you are trying to understand the vexingly amorphous FRBR standard — Functional Requirements for Bibliographic Records — there's a good

chance the example you'll come across is *Hamlet*. FRBR provides a conceptual model for understanding the relationships among the different versions and editions of what we usually think of as a single work. At the bottom are *items:* the thumb-worn copies on a library shelf. Each one of these is a *manifestation* of something like an edition. Above these is the *expression*, which ideally would be Shakespeare's original handwritten manuscript. And at the top of the FRBR heap is the *work* itself, of which that manuscript is itself an expression. With *Hamlet,* there are folios, annotated editions, large print versions of the annotated editions, versions in Braille, and graphic novel, each of which is some type of manifestation of the play that Shakespeare created and wrote down.

Hamlet is used as an example so often in explanations of FRBR not only because it is such a famous work, but because *Hamlet* makes apparent just how complex a problem it is simply to figure out what a work *is*. With Shakespeare we have not only the various editions, but also performances, recordings, films, and folios. The one thing we don't have is a single manuscript recorded in the author's hand from which all other versions and variations can be seen to flow. Instead we have a ragbag of manifestations that each claim to be *Hamlet* in one form or another.

Except, as Shakespeare scholars understand better than anyone, a ragbag is a terrible metaphor, and not just because of the difference in cultural value between Shakespeare's works and scraps of cloth. Each item in a ragbag is independent of every other, whereas much of the work of Shakespeare scholarship is to discern the relationships among the manifestations of *Hamlet*. The differences among the folios are noted and used to explain one another, and, one hopes, to hypothesize about the

author's intention. The annotated versions refer to spots within, across, and beyond the Shakespearean corpus. The varioria bring the commentaries into conversation with one another across centuries.

So, suppose we were to drop the ragbag metaphor and try to come up with a better one. We would want it to give us a much richer model than the four-level structure that FRBR proposes. We'd want to be able to show the relationships among the rest of Shakespeare's works, and its historical precedents, from Kyd backwards and forwards. It would be useful to note the centuries of critical responses. And since we're drawing connections, we'd likely want to include not only canonical and responsible manifestations of Hamlet, but also derivatives that include Disney's *The Lion King*, and the 1983 movie *Strange Brew*. This is not to accord Shakespearean status to either movie, but it would be useful to at least have those tenuous links noted, not necessarily because they shed light on *Hamlet* but because they may help us understand how cultures have taken up that work. For the same reason, someone somewhere will find value in following the links to all of the daily comic strips that have riffed on "To be or not to be." Again, this may be of no use to any serious scholar of the play itself, but it may reveal insights into how art is debased or how art shapes culture.

Now, if we were to take a bird's eye view of the relationships we've mapped, it would not look like a ragbag. Nor would it look much like an index or an outline, for those forms are too neat and constraining. Instead, it would look like a network: many pieces messily joined. This particular type of topography has a few prominent characteristics:

- It is without practical limits on how much it can contain and connect.
- It is composed by its participants over the centuries without a centralized or coordinated plan.
- There is no center. Or, more exactly, the center is whatever you happen to be interested in.
- There are no edges. Or, more exactly, the edges are where your curiosity ends.
- It is inclusive; every connection is by definition part of the network.
- The links may express any type of relationship. Those relationships are almost always explained in the text, explicitly or implicitly.
- The instantiated links are one-way.
- The objects linked to did not give permission to be linked to.
- It is extremely messy.
- Because no authority maintains or archives the objects and their links, it is not highly reliable.
- Anyone can add content or links.

These are, of course, properties of one particular type of network: The Internet's World Wide Web. They are distinctly not properties of paper-based objects of knowledge. Books and journals are limited vessels: relatively few manuscripts are accepted for publication, and the size of their contents is constrained by economics and engineering. Paper media divide knowledge up into topics, although they include footnotes and other forms of broken links. They limit the extent and timeliness of discourse. The difficulty, limitations, and expense of publishing also mean that most of the actual discourse is done in various types of private environments — letters, classrooms, discussion halls, pubs — that are lost to the public sphere.

The loss of that which fails to make it through the paper media's filters does not seem like much of a loss within the traditional domain of scholarship. What gets filtered out is exactly that which has little or negative value. But it only looks that way because we have so confused scholarship with publishing. And that has occurred not because the processes and institutions of scholarship are ideally like those of publishing, but because publishing — print publishing — has been its medium. For example, what gets filtered out may not have little value but just too little to justify the expense of printing it. Further, it may have no value to the vast majority of scholars, but would have tremendous value to one or two. Worse, what is relevant changes over time, as we have seen as issues of gender equity, racism, and animal rights have emerged historically. We have fitted our measure of "little value" around the economic barriers print imposes.

Another important consequence of adapting scholarship to the strictures and structures of publishing has been that we think of scholars as authors, and have assumed (more so over time) that authors work primarily as individuals. So, we have traditionally thought of scholars as individual experts, working on the issues that have seized them, almost always in a competitive (yet, we hope, collegial) war of all against all. If two scholars are addressing the same question, they will be in contention, for they have chosen a question that has not been resolved, and they only succeed professionally as scholars if they stake out a claim that is different from the claim of others. So, although of course scholars work within a milieu and ride on the shoulders of history, it is still primarily an individual's game.

We have not only assumed this, we have institutionalized that assumption into a system of credit and responsibility.

Networked scholarship does not negate the individual in favor of the network. The movement is more Hegelian than that: the network of scholars lets individual experts flourish, but creates a synthesis of individual and community that is other than a mere combination of the two. It locates knowledge not in the heads of individual experts but in the network itself. The individual experts remain in contention, but it is a linked contention. If two scholars are posting learned but opposing arguments about, say, the order of the plays' composition, even if they don't know about one another, the network does; if they are on the Web, they are perforce linked. Two experts might not know about each other, but a perspicacious reader or a clever search engine algorithm can bring them into juxtaposition, so what they have in common and where they disagree can be discussed — and that discussion itself becomes another node in the ever-expanding network. The result is not merely a series of position papers, some connected in tight clusters, but an open, shifting set of ideas that are in direct and indirect conversation. This is a network is loose-edged, unsettled, and without filters that permanently exclude what they reject. In these ways and others, the scholarship has taken on the properties of its new medium.

This gives us a picture of scholarship that is by no means entirely new, yet is different. For example, we still need experts investigating the plays and the man. We need them to be using the traditional tools as well as the most modern tools. But, insofar as scholarship lives at the level of the network, it will be measured not simply as the practice of individuals, but

by how fully it develops a public web of experts in contention and in discussion. “Fully” here means: many people, many levels and types of expertise, many topics, many conversations, many disagreements and differences, many many many links. If magnificent scholarship is being done but is not in direct conversation, then networked scholarship has failed. If there are ideas an interested person can’t get to, then the networked scholarship has failed. If there are bad ideas uncommented on and uncorrected, then networked scholarship has failed. If there are explanations but only for scholars, then networked scholarship has failed. It succeeds when it takes on the properties of the network: open, inclusive, linked, contentious and collaborative, unsettled and lively.

The networked knowledge that is the subject and fruit of networked scholarship has some important advantages. For one thing, it scales: it can get very big. It does not insist on drawing strict lines around topics or disciplines. It enables participation by people at their own levels of expertise and interest. But there are certainly dangers with networked knowledge as well. First, without the traditional filters in place, it is easy for the unsophisticated to go wrong. Second, you can not only go wrong, you can become more convinced of your erroneous views because you are hanging out online with people who all agree with one another; this is known as the “echo chamber” effect.[i] Third, you can be distracted by trivialities and tangential ideas. Finally, there is some evidence — contested — that interaction with the Net affects our brains so that we find it harder to follow long chains of argument and to think deeply.[ii]

Scholars are not powerless in the face of these dangers. They now have an opportunity to shape their practices to support the development of

networked scholarship that both makes them better scholars and helps their culture learn from their work. Let's look at some of what we scholars can do to facilitate the development of networks of knowledge that make us all smarter.

Building smarter networks

We are still discovering how to best contribute to networks of knowledge. Here are some steps we can take with the confidence born of widespread experience.

Support open access. Knowledge networks only thrive when the relevant content is openly, freely available to all. Open access publishing achieves that. Note that this does not necessarily mean that scholars should publish in non-peer reviewed journals; most open access journals are peer-reviewed. There is, of course, still prestige in having one's work accepted by a for-pay journal, and that may matter a great deal, especially to younger scholars trying to make their name and to get tenure. But, it is quite likely that locking one's best work into journals that few can afford increasingly will be seen as a type of selfishness. (The same is true for writing a chapter for a closed access book.)

Post as well as publish. While the line between posting and publishing has always been fuzzy and is getting fuzzier, there is a different ethos to posting. Publishing implies a finality of the product, and some editorial filtering. Posting is just the sticking of some ideas into a public place, possibly before they've been fully thought through. Publishing is good, of course, but posting also has value. It gets ideas out faster, it gets them out

before the author feels compels to defend them as a matter of pride, and it provokes earlier discussion that can take ideas in new directions.

Be explicit with your metadata. The old paper world generally made clear the status of what we're reading, often implicitly. If it's a book or journal article, then we know it went through a careful editing process. If it's a paper presented at a conference, then it may be a bit more tentative in its findings. If it's a casual talk given at a weekly faculty get-together, the content may be exploratory. But as the Web makes it easier for us to post in a wide variety of forms — blogs, tweets, chats, hangouts, etc. — we will often find it advantageous to make public ideas that are more tentative. We may try on ideas in order to see how they look when worn. It is therefore incumbent upon us to make clear the status of our posts. If it's a draft, then that needs to be stated clearly, possibly in red font at the top. If it's a trifle, we need to let people know that. If it's as good as we can make it, it deserves to announce that.

Link everything. Of course you'll link to the sources you use. That is your responsibility as a scholar. But in the networked environment, your responsibility is to further. Ask yourself two questions:

First, how can you help a reader who may come to your work not as well-informed as you'd like, because on an open Web, there are no prerequisites for access? So, what can you link to that will explain concepts and terms that people need to understand your point? Be generous. What does it cost you to link your first mention of Ovid to the Public Broadcasting System's page about him[iii] Wikipedia has an excellent article on iambic pentameter,[iv] so even though — or because — readers ought to be familiar

with the term, you should throw in a link. You might even pander to your readers — that is, effectively stimulate the interest of your less informed readers — by pointing them to Peter Sellars reading of the lyrics of *A Hard Day's Night* in the style of Sir Lawrence Olivier's Richard III.[v]

Second, ask yourself how you can feed the curiosity of an intelligent reader. Since scholars are also teachers, what one-click access can you provide your readers to stimulate their thinking beyond what you're saying? How can you get your readers out into the network of ideas in which your work resides? You might link to Jeremy McNamara's lively account of Ovid's influence on Shakespeare,[vi] or Peter Hall's argument in favor of observing iambic pentameter in performance.[vii] If someone doesn't know as much as you about a concept, a person, or a work, then do them the favor of linking to a source that will explain it to them. You do us all a special service if you link to works you disagree with, but that you think are worth our time. That's how we grow a web. Linking is not just a scholarly responsibility, but a social duty.

Linking widely is especially important now that we're losing the natural filter paper imposed. In the past you could assume that the audience of your book primarily consisted of people who valued your work highly enough to have spent a fair bit of money to buy it, or were students or professors at a university that subscribed to the journal. As we begin posting and publishing on the open Web, we lose that filter. There is thus no way of controlling who sees what. This is a very good thing indeed. But it means that your work can have more effect — more people can learn from it — if you link to explanatory sources.

Try out ideas. As the network revolution continues, we will undoubtedly devise new techniques and norms to make networked scholarship and knowledge more useful. We should be experimenting, and paying attention to the experiments of others.

Supporting open access, posting, linking, adding contextualizing metadata, and experimenting are important even though they will not directly improve your scholarship. They will, however, make better the network in which your scholarship is developed, is encountered, and finds its meaning. These actions make the network better for its participants, whether as readers or contributors. These days, there is so little separating the two.

Networked readers

There is also work we need to do to improve the way students and other readers engage with scholarly networks. We will look at two areas: building better devices, and creating better sources.

Better devices

In one sense, we already have the ultimate device for reading online: the Web. But, we seem to be preferring either specialized devices such as the Kindle, or proprietary software on more open platforms, such as running Kindle software on a tablet or smart phone. While specialized devices and proprietary software can provide useful functionality and a pleasant experience, they often do so at steep social costs: they can limit the sources from which one can conveniently access books, they often lock the book's content into proprietary data formats that cannot be easily or legally shared, and they prevent others from adding functionality to the device or

software. This last point is important because it means that insofar as we give over our e-reading experience to these proprietary e-readers, the pace of innovation in this technology will be drastically slowed; think about the glacial pace of innovation in the telephone system versus the onrush of innovation on the open Web.[viii]

Worst of all, these proprietary devices and software applications are dead ends on the Web. They make it difficult or impossible for the human beings using them to link works together, or to discuss these works in real time with the rest of the world. They only marginally participate in the cumulative enrichment of the scholarly environment.

Apps, like the ones that run on the iPhone and Android devices, are a rising alternative. As Alan Galey's contribution to this volume makes clear, some of these apps are quite impressive. Shakespeare scholarship is especially appropriate to being accessed via apps because plays are inherently multimedia events and sonnets should be heard as well as read. We will undoubtedly see more and more apps that enhance our appreciation of Shakespeare.

But apps — at least the ones already developed — are almost always self-contained environments. Apps tend to use network connectivity the way the Kindle does: simply to access materials. They generally do not provide links out to content and applications beyond their boundaries. They thus do not open lead out into networked knowledge, and do not enrich the network of knowledge. Sometimes that's because the app makers have an economic reason to keep people within their boundaries, but at least as frequently it's because they created an app because they couldn't deliver

their desired functionality within the boundaries of a Web browser; the price of this high-value experience is that it occurs within the walls of the app. An app can illuminate, amaze, and delight. But apps in general do not directly enrich the networks of scholarship and education. For example, there are now tools that enable users to annotate pages, and to do so in the Open Annotation data format that is designed to make those annotations shareable and reusable; these annotation tools can be used with any HTML page, but not within apps. Annotations made using the Open Annotation standard contribute to the network of ideas and knowledge; annotations made in a proprietary format do not.

The tradeoff between openness and specialized features will often be worth making. Still, we should recognize that it is a tradeoff. Scholars can help encourage an open ecosystem by taking a few steps:

- Consider the trade-offs when developing an app or contributing to one.

- Avoid assigning works to students that are available only in proprietary formats.

- Post on the Web in HTML as opposed to PDF. PDF has the advantage of preserving the original page-based look of a work, but that can make it hard to read on devices with smaller screens. It is also harder to reuse the content of PDFs. It is also usually impossible for others to link to a particular portion of a PDF.

Unfortunately, the future direction of e-readers is likely to be far more influenced by economics than by the immense value openness brings to knowledge networks and to the Net overall.

Better sources

Fortunately, there is another approach we can also take to creating e-readers that work better for the networked understanding of Shakespeare. Scholars can create *content* that is better designed for maximal discovery, integration, and reuse.

Let us say that you are interested in producing a new variorum of *As You Like It*. You have four basic approaches.

The first is the traditional one. You gather your sources and interpolate them into the text of the play. For example, you will provide a footnote to line 178, bringing together the arguments among the scholars about whether Orlando's "wherein I confesse me" should in fact be "herein I confesse me."[ix] You will make the decisions about how to arrange the play and the commentary on the page, and you'll probably deliver it on paper or as a PDF file.

The second approach takes the path of the typical app. You gather your sources as before, but you make it interactive. The user can, perhaps, expose differing levels of detail. Perhaps the word "wherein" is displayed in blue, indicating that a click will expose additional information, such as a translation into modern English. Perhaps that translation itself has a link to the next level of scholarship. Perhaps when the original commentaries are available on line, your variorum app hyperlinks to them. This is, of course,

just an example. The possibilities for interactivity with apps is as broad as our imagination.

With the third approach, in addition to publishing a traditional version or an interactive one, you could also make the data behind the variorum publicly available. That data consists of your extensive notes and clippings from the existing scholarship, and the logic you've used for putting them together. Before computers, you may have done this with index cards, or you may have availed yourself of some of the ingenious 17th century scraps-assemblage apparatuses recorded by Ann Blair in *Too Much to Know*[x]. In the age of the computer, you almost certainly are using some application that lets you write notes, tag them with labels or other metadata, and then assemble them automatically on command. Let's refer to these notes as *records*, using database terminology that arose after computers but before the Web. (Current technology doesn't always require records and permits more ad hoc forms of "scrap management.") After years of research, you have thousands of these digital records. Each probably has a quote from a source, a pointer to bibliographic information about that source, a reference to the exact line in *As You Like* It, and perhaps some tags about the quotation's context such as "grammar, "misprints," or "18th century." As you put together the draft of your new variorum, you will use the internal database functionality of whatever software you're using to pull together the pieces. In this third approach, you will choose to make these records publicly accessible, well as as your particular way of pulling these pieces together.

Why would you make your notes public? For two reasons. The first is that it provides the next level of scholarly footnotes. Someone who thinks,

for example, that you got a source wrong will easily be able to find the original. Or someone who wants more information will be able to get it with a single click.

The second reason is ultimately more important. Your notes can become a public resource that makes the entire network smarter. Not only can any human user avail herself of your work, developers can create their own applications that wring more value from your work. For example, a developer might create software that plots commentary on a timeline, an educational application that lets classes select the commentary they find most helpful, or an analysis tool that finds unexpected relationships among sets of notes from multiple varioria. The New Variorum Shakespeare *Comedy of Errors* Digital Challenge is a good example of this.[xi] The Modern Language Association released that play's variorum under a Creative Commons license that permits reuse without permission for non-commercial purposes, and awarded prizes for applications that took advantage of this open data. The winner, Bill-Crit-O-Matic by Patrick Murray-John[xii], lets users search for words in the commentaries and then click a link to see the relevant passage in the play, thus reversing the usual relationship between text and annotation.[xiii]

The fourth approach is an extension of this third approach. The MLA's contest worked because it made the text of the variorum available in a standard format designed for computer processing. This enabled innovators to download it and process it in interesting ways. The MLA could, however, choose to make the play and commentaries available to computers directly over the Internet in the form of a database without requiring a download. By providing an API (application programming

interface), developers could write applications that could query that database directly. This approach is known as building an open *platform*: a set of resources that can be retrieved by computer applications written by anyone on the Net. For example, someone somewhere on the Net might write an application that lets users choose a time frame and then see all the commentaries within those dates. In a platform approach, when a user asks to see, say, the comments from 1850-1900, the application in real time requests that data from the MLA site. The MLA runs its database and returns the results to the application which then presents it to the user in a useful way.

An open platform has several important advantages when compared to the third approach.

First, in the third approach a developer downloads a file of information that a computer can process, and then writes software that makes that information useful to an end-user. But then the developer has to host that data somewhere, which adds a level of expense and complexity. In the platform approach, the group providing the data hosts it.

Second, consider what happens when the original information provider — the MLA in our example — updates its data, perhaps correcting it or adding to it. In the third approach, the developer is using a copy of that data, which will become further out of date every time the MLA updates the original.

Third, open platforms encourage community and collaboration. The platform itself benefits by re-absorbing the work done by developers and even by the way users use that work. For example, if a developer creates an

annotation tool that draws upon content from the MLA, those annotations could (with the permission of the users, of course) be made available to other developers. The platform has an incentive to let developers find one another, to discuss problems and possibilities, and to reuse code. Platforms provide a stable place where a community can continuously enhance the platform's offerings.

Finally, in a world of platforms, data can be "mashed up" with other data. For example, an application could request commentaries from the MLA platform, but also request biographical information about the commentators from another platform, and about world historical events from yet another platform. Platforms dramatically improve the networking of what we know.

Whether a group takes the third or fourth approaches, it is hugely help to make information available in a standard data format. That way computers can access your data and make sense of it, recognizing one string of characters as a title, another as the author, another as the play to which the comment applies, another as the line number, and so forth. One particular standard is becoming quite important because it lets computers knit together differing sources of notes with great agility: Linked Data. Linked Data has a number of advantages, but one is crucial to the development of smarter networks.

Imagine two sets of scholars create Linked Data about Shakespeare. The first scholar refers to *Hamlet* as "Hamlet" and the second refers to it by its First Folio name, "Tragicall Historie of Hamlet, Prince of Denmarke." Computers are too literal to recognize that these data sets refer to the same

play. To get past this problem, Linked Data encourages using hyperlinks rather than text. So, rather than saying either "Hamlet" or "The Tragedy of Hamlet, Prince of Denmark," the Linked Data representation of this data would use a Web address of some public resource. For example, for the title of the play it might point to http://en.wikipedia.org/wiki/Hamlet, which is the address of the English-language Wikipedia page about *Hamlet*, or it might use http://shakespeare.mit.edu/hamlet/full.html, which is where the Massachusetts Institute of Technology has the text of *Hamlet* openly available. If a computer sees two data sets pointing to the same resource, it will correctly assume that they're talking about the same thing, getting past the problem that people refer to things in very different ways, and in different languages. Of course, it introduces a new problem because our two piles of Linked Data may be pointing at different sources. This, however, is relatively easily solved; over time public mappings will be developed that will tell the computer that those two Web addresses are in fact referring to the same thing. Once that connection is made and is made public, the two piles of data can become connected programmatically. This technique allows many different types of datasets to work together. For example, a Shakespeare dataset might contain a pointer to the town of Avon, but so might datasets about genealogies, local fauna and flora, and the historical spread of Catholicism. Linked Data lets all of these datasets be interrogated, yielding relationships that otherwise would have been extremely difficult to unearth. Linked Data makes the network smarter.

Even if Linked Data does not prevail as the dominant way of publishing information for computer access, making one's notes public in machine-readable form will still vastly increase their value. And not just notes

toward a variorum. The data and research scholars use to write papers and books can also enrich scholarly networks if they are made publicly accessible in ways that make them findable and usable by computers. Not only will we be able to connect many more dots within the Shakespeare universe, that information can now be "mashed up" with data from other fields. This will make Shakespeare an even more vital part of our culture.

Shakespeare as network

So far I have maintained that supporting research practices and technologies that enable the growth of scholarly networks has practical value. In this final section I want to take one further step: Scholarly networks are a more appropriate and even more truthful representation of scholarship and of the content of scholarship, that is, of knowledge.

I advance this claim with trepidation in no small part because there is no clear path to verifying it. It is the same sort of a claim as maintaining that plays are more appropriate for depicting human existence than are, say, tweets or eulogies. To support this claim, one might show the ways in which the human personality can be understood as a type of performance, and the ways in which the liberty and constraints of a theatrical narrative well express the nature and limits of human agency. In the same way, we can argue that the form of networked knowledge is a better representation of human knowledge than was the prior print-based medium.

Shakespeare scholarship happens to provide us with a particularly apt example.

First, we know so little about Shakespeare the man that rather than using his biography to illuminate the works, we use the works to try to

figure out who the man was, whether that means filling in our understanding of the personality and circumstances of the plays' author or even deciding on the identity of that author.

Second, there are few writers for whom we have less agreement about the authoritative versions. Not only do we have multiple folios, scholars try to discern the personal styles of the compositors based upon minute differences.

Third, the unreliability of the transcripts, the evolution of English, and Shakespeare's constant inventiveness have resulted in centuries of academic dispute. Even what would seem to be relatively straightforward questions — "sledded Pollacks" or "sledded pole-axe," and what does the phrase mean anyway?[xiv] — spawn cross-century arguments.

Fourth, these discussions matter because Shakespeare matters so much to our culture. Between sledded "Pollacks" and "pole-axe" there may not be a lot at stake, but between an intelligible Shakespeare and a Shakespeare who falls mute to our ears, there is a tremendous difference.

So here we have scholarly questions — learned attempts to know Shakespeare and his work — that are hard to settle, have long histories, that have been much discussed, and that matter a great deal to our culture. The Internet is far better designed for this scholarly cacophony than print ever was, for the Internet is capacious, enables rapid as well as leisurely responses, is publicly accessible, and most important, is linked.

Over the centuries of argument about every aspect of Shakespeare and his works, the vast majority of those disagreements were pursued in

private, or in highly limited public spaces: a dinner table, the hallway of a theater, a classroom, the lobby of a public lecture. Of course, the vast majority of those disagreements were of little value except to those engaged in them; history is none the poorer for not recording the conversation in our family car as we drove back from the 2005 Shakespeare & Co. performance of *The Taming of the Shrew* in Lenox, Massachusetts. But even discussions of such local interest might enable people to find others with similar interests and different viewpoints. And many discussions far more worth recording have been lost because to warrant their publication in the Age of Paper, disagreements had to rise to levels of significance that excluded all but a tiny percentage of them.

The Internet's bar to publication is somewhere between most people's ankles and mid-shins, so much more makes it into the public sphere. But the new abundance of content and of disagreement is by far the lesser consequence of the Internet. Indeed, if that's all the Net did, then the claim of cacophony would be fully justified. But, the Net is composed not only of voices, but of links. Responsible online scholarship provides clickable links not only to its sources but to the ideas with which it contends. Additional links are created among differing sources by those who respond, whether that is in another scholarly article, a blog post, an email to a mailing list, a Facebook entry, or any other of the Net's constantly-extending conversational forms. Each of these links provides not just an easy way to go from one idea to a different idea, but also builds a traversable map. This map is not an *expression* of our knowledge the way a library is. Rather, it *is* the knowledge. It is where knowledge is built and where it occurs. Knowledge itself is transformed by the linked structure it now inhabits. The

network of scholarly articles shows knowledge to consist in their connections and disagreements. This is a territory of differences.

Of course scholarship has always been contentious, fractious. But now the primary objects of scholarship are not the individual works but the network that links them. The territory of perpetual disagreement is made richer by these linked disagreements, and the landscape those links form is a more accurate representation of scholarship than the old media enabled. In short, network knowledge contains difference. Disagreement is how you let knowledge get really really big.

As Neil Jeffries posted in the op-ed section of Wikipedia in 2012:

> Rather than always aiming for objective statements of truth we need to realise that a large amount of knowledge is derived via inference from a limited and imperfect evidence base, especially in the humanities. Thus we should aim to accurately represent the state of knowledge about a topic, including omissions, uncertainty and differences of opinion.[xv]

In this view, the "state of knowledge" is better exemplified — or embodied — by a messy network of disagreements than by a neat shelf of vetted books.

But, surely including disagreement and argumentative uncertainty within the domain of knowledge is just a linguistic trick! Yes and no. Yes, in that we do not want to obliterate the difference between justified true belief and mere opinion, the distinction that gave birth to our concept of knowledge in Athens two and a half millennia ago. But, no, it is not a mere linguistic trick because there is value in remembering that even classic knowledge is less certain, more social and more linked than the classic idea

allows. That is, the state of knowledge is really no different than the state of scholarship.

Indeed, if I were a Shakespeare scholar, which I manifestly am not, I might suggest that this view of knowledge is far closer to Shakespeare's own. The hard nuggets of certainty in his plays often are known to the audience from the beginning to be false — Desdemona is unfaithful, Cordelia doesn't love Lear enough. And when the truth is stated starkly at the beginning — the witches' prediction to Macbeth, Hamlet's father's accusation — it does little to undo the swirling confusion and unknowing that is characteristic of the project of human knowing.

We have acted as if disagreement and argument were temporary phases as we work toward settled knowledge. That is an understandable assumption when the medium of knowledge was paper, for that assumption essentially repeats the publishing metaphor: ideas go through a period of development, and when they are ready and finalized, they are committed to paper and put out into the public sphere. Knowledge exists in settled statements.

The Internet's metaphor for, and embodiment of, scholarship and knowledge seem to me to be closer to the truth about scholarship and knowledge. For example, Shakespeare's life and works have been a continuous subject of argument and disagreement not only because we have so little evidence, but because a life is never fully understood, not by those who study it, and not even by the one who lived it. While we may someday come across a text that settles sufficiently whether it was a sledded pole-axe or Pollacks, we are not ever going to settle how exactly

that phrase nudges the play into shape, much less settling "the meaning" of the play so that now scholarship is done. Scholars will instead find new connections, new meanings, new links that cast reflected light in unpredicted hues. We will as audiences find new ways these plays simultaneously make sense of and alter our lives. We will continue to engage in the knowing of Shakespeare because Shakespeare — the person and the work — is itself a network of messy links, always in contention.

# # #

NOTES

[i] Sunstein, Cass. Republic.com, TK.
[ii] The Shallows, TK.
[iii] http://www.pbs.org/empires/romans/empire/ovid.html
[iv] http://en.wikipedia.org/wiki/Iambic_pentameter
[v] http://www.youtube.com/watch?v=zLEMncv140s
[vi] http://department.monm.edu/history/faculty_forum/ovid.htm The transcript of this lecture regrettably contains no links
[vii] Hall, Peter. *Shakespeare's Advice to the Players* (Oberon Books, 2003).
[viii] See Jonathan Zittrain's *The Future of the Internet and How to Stop It* (Yale University Press, 2008). It is available for free under a Creative Commons license: http://futureoftheinternet.org/download
[ix] Furness, Horace Howard, *A New Variorum Edition of Shakespeare*, Vol. VIII, It (Lippincott, J.P., 1890), p. 38
[x] Blair, Ann. Too Much to Know. [TK]
[xi] http://www.mla.org/nvs_challenge
[xii] http://billcritomatic.org/
[xiii] Paul Werstine describes similar work done by Alan Galey that allows for very useful slicing and dicing of the *Winter's Tale* variorum. Werstine, Paul(2008) 'Past is prologue: Electronic New Variorum Shakespeares',Shakespeare,4:3,224 — 236 70
URL: http://dx.doi.org/10.1080/17450910802295070
[xiv] *Hamlet,* Act I, Scene 1
[xv] Jeffries, Neil. "Representing knowledge – metadata, data and linked data." *The Signpost*. July 2, 2012 http://en.wikipedia.org/wiki/Wikipedia:Wikipedia_Signpost/2012-07-02/Op-ed