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SHAKESPEARE PROCESSING: FRAGMENTS FROM A HISTORY

BY JONATHAN STERNE

If Shakespeare had been able to write his plays using an early floppy disk format, his work could have perished alongside the equipment to read it.

—Lynne Brindley, quoted in IBM Press Release, 2000

[A] 3-1/2-inch disk . . . could handle 1.44 megabytes of data—that’s about enough for a three-minute song, or 11 copies of William Shakespeare’s *Macbeth*.

—“R. I. P. Floppy Disk,” BBC News, 2003

I.

What kind of media phenomenon is “Shakespeare”? If there is one consensus in the burgeoning scholarship on Shakespeare and media, it is that Shakespeare is a ubiquitous media phenomenon, at least in English. Following Lawrence Levine’s classic *Highbrow/Lowbrow*, we could note that his ubiquity is a result of a combination of factors: the prestige conferred by Shakespeare’s writings on their users, institutional investments in circulating Shakespeare’s work and making it familiar to new audiences, and perhaps the work that Shakespeare’s texts do in stitching together a sense of cultural continuity (whether real or imagined) between his time and ours.¹ Such answers come from a reception history, and we could extend them to media: users and makers of new media confer prestige on their devices by using them to refer to Shakespeare. But such an answer does not necessarily help explain the work Shakespeare materials do inside media, especially at key moments when media technologies emerge or transform. Consider the epigraphs above. How is Shakespeare or *Macbeth* being used as a measure of durability or storage capacity of digital media? If Shakespeare bestows cultural authority upon his users, how and why

do media—which are supposed to just work according to the laws of physics, physiology, and psychology, as one branch of media theory would have it—marshal him as a reliable assistant at key moments of their emergence?

Shakespeare has always existed between forms: a playwright whose work is celebrated as literature, a cultural icon who has stood in for almost every imaginable value, a figure treated as a celebrity and genius, a stand-in for high culture and legitimacy at large, a stand-in for low culture and popular aesthetics, a name that ties together vast library collections of humanistic treasures, an instructional tool, a set of memorized lines, a collection of quotations, and a common cultural base for a wide swath of elites, not only in the Anglophone world, but in the German-speaking and French-speaking worlds and elsewhere.² As Michael Witmore said to me while we turned the pages of a Folger Library first folio, had Shakespeare written his plays 78–80 years earlier, they would likely be unavailable to us today. Print binding, publication, and circulation technologies emerged as his work was gaining popularity. As Zachary Lesser and Peter Stallybrass argue, the publication of the 1st *Hamlet* quarto did a lot of work to consecrate itself as literature by bedecking it with scholarly annotation: “[S]ententiae or commonplaces that are pointed out to the reader, either by commas or inverted commas at the beginning of each line or by a change in font.”³ And without an active archival and publishing practice in the eighteenth and nineteenth centuries, Shakespeare would never have achieved his current status as Shakespeare.⁴ True or not, de Toqueville’s famous line that “there is hardly a pioneer’s hut that does not contain a few odd volumes of Shakespeare” is a testament to the state of the publishing industry as much as anything else.⁵ The ubiquity of Shakespeare, and the work’s status as a secular text (in contrast to that other most-possessed book in de Toqueville’s nineteenth-century America, the Bible) is an important prior condition to the story I tell below.

But beyond the print history with which he is usually associated, Shakespeare is also ubiquitous in media history, and here the story begins to change a little. During the nineteenth century, his rise in popularity coincided with the emergence of technical media. Friedrich Kittler uses the term “technical media” or “technological media” to distinguish media technologies like photography, film, and sound recording from earlier technologies like writing, where “streams of data” had to “pass through the bottleneck of the signifier.”⁶ While Kittler’s bottleneck of the signifier is written language, when someone

wants to demonstrate the technicity of technical media, every media form presents its own unique bottleneck, and something must pass through it in order to give it shape. At least in the Anglophone world, that something is often Shakespeare. In one way or another, photography, lithography, halftones, phonograph records, telephone concerts, films, radio plays, stereo vision devices, television, microfilm, hypertext, and video games all lay claim to Shakespeare, especially in their more experimental, emergent or divergent forms, or at moments of phase change. In these moments, media often present their technicity to audiences through an act of Shakespeare processing, as I will call it. By taking some Shakespearean material and remediating it, media demonstrate something about themselves. More precisely, when demonstrating new media or formats, people use Shakespeare processing to perform some aspect of the medium. That aspect may be a technical or cultural feature—either way, the act of Shakespeare processing makes it appear as if it were inherent to the medium, a necessary component or a logical outcome of the media form under demonstration.

In their definitional moments of Shakespeare processing, media rarely process whole plays or sonnets. They use fragments, references, quotations, single images, excerpts, and a host of other items that refer back to the plays and sonnets, but are not themselves usually works or even really adaptations in the sense that the term is usually applied. Librarians, bibliographers and others seem to use two words—*Shakespeare realia*—to refer to statuettes, figurines, and other small Shakespeare-related objects that are not themselves his works. For this paper, I inflate the term to a neologism, *Shakespearealia*, that includes among other things, 140-character tweets, gibberish spilling out of the mouths of video game avatars, dusty stereoscope slides, barely audible recordings, obsolete machinery, experimental broadcasts, and vague references to the whole body of Shakespeare's work or some part thereof as a stand-in for some other cultural value. Shakespearealia is one part Shakespeare, but it is also one part realia, one part paraphernalia, one part ephemera, and one part psychedelia. In other words, in their moments of Shakespeare processing, emergent media or their users may evacuate as much presumed content and literary reference from the term "Shakespeare" as possible. Richard Burt has written that Shakespeare's work has always been "mediatized and subject to dislocation, decontextualization, and fragmentation."⁷ Let us take his proposition a step further and deploy Shakespearealia to designate materials that are used to test, legitimize, or celebrate

particular modes of circulation. Shakespearealia do not necessarily refer back to a larger mass of work from which a fragment is detached or remediated; they are more likely to refer to the mediatic processes through which they pass.

In following this path, I take up what scholars have recently renamed the media archaeological impulse. As historical objects, media can fragment the fictional smoothness of historical time, in part because they come to be attached to particular narratives and temporal logics. Thus, we will not consider some of the most common frames of reference in Shakespeare scholarship: I will not discuss Shakespeare's works in terms of their adaptation, their reception, or their cultural context.⁸ By focusing on Shakespeare processing, I turn attention from the mediated Shakespearean text to the media themselves as objects of historical inquiry. As a tool for demonstrating mediality, Shakespeare's work does not have to be any of the things we usually attribute to it. It does not have to be great literature or theater or poetry—Shakespeare doesn't have to say or mean anything in particular. It is, conversely, the ubiquity and imagined stabilities in Shakespearealia that allow them to do their work across media. In other words, media forms do not only point to the fact that Shakespeare is adapted. They point to the fact that Shakespeare is processed.

But this would be to suggest that media simply do their work on Shakespeare. My proposition is at least 50% the opposite: Shakespearealia do their work on media. When technical media emerge or go through a change of phase, quite often—though not always—one of their early tests is as Shakespeare-processing machines. In other words, people use Shakespearealia to prove that media can mediate at the moments of their emergence or transition. Since at least the middle of the nineteenth century, people have frequently—though not always—turned to Shakespeare processing to demonstrate the mediality and the medium-specificity of emergent media technologies. And this discourse is so pervasive it even enters media theory, reflexively. In these moments, people perform media by performing Shakespeare. They describe the possibilities of media using Shakespeare. Thus, if this essay is a media archaeology, it is a media archaeology in reverse. Rather than turning to the operational dynamics of the technologies themselves as points of departure, I turn to Shakespearealia as a set of reference materials—to use Dylan Mulvin's term—as well as platforms for performance, to reveal a recursive process of media revelation. As reference materials, Shakespearealia “temporarily structure relationships of comparison and classification by investing certain people,

places or things, with the capacity to compare other people, places, or things.”⁹ As a platform for performance, Shakespeare processing is a way people demonstrate the mediatic character of media technologies.

While it would be possible to move toward a catalogue of Shakespeare-processing instances, I will instead bring forth a few episodes that demonstrate different aspects of Shakespeare processing. In the epigraph from BBC news at the top of this article, a “*Macbeth*” becomes a unit of storage, to demonstrate the power of a floppy disc to store information. As it rhetorically reduces *Macbeth* to information, it also uses “*Macbeth*” as a way to represent the empty or potential interior space of the floppy disk as it fades from social existence (or at least as its death is declared). In Lynn Brindley’s anticipatory lament, the hypothetically lost oeuvre of Shakespeare is meant as an index of the fragility of a particular storage medium.¹⁰ Whether they are books or floppy discs, the physical components of media are always fragile. With their climate control, backup and transfer protocols, and staff members, institutions make older media more durable. Left to the elements, or neglected in a closet or drawer, any media technology will age and decay. Brindley’s hypothetical refers to the cultural loss that would happen if Shakespeare were to disappear. Again, his oeuvre is information to be stored, and in this case, preserved. It is a model for other things that we might like to preserve in the future. It is both information and example. It is a measure of duration and durability rather than interior volume, but a measurement just the same. Shakespeare’s writings operate as stand-ins for things that matter in the world of media.

II.

Sometimes the thing that matters most in media is the matter in which a medium is made. This was certainly the case with early sound recording. While durability of recordings was considered one of the major promises of the phonograph, Thomas Edison’s cylinder phonograph used a stylus to indent impressions onto tinfoil mounted to a cylinder that turned on a spindle. To play it back, the stylus would be run along the indentations and its vibrations amplified through a diaphragm and horn. This was not an ideal system. The impressions on the tinfoil degraded with each playback, and the moment the recording was removed from the spindle, it was lost forever, except as a souvenir at public exhibitions.¹¹ Edison and his assistants were aware of this problem, but he abandoned the phonograph after the

1878 “phonograph craze” in order to pursue the much more lucrative field of incandescent electric lighting.¹²

Meanwhile, Alexander Graham Bell had won the Volta prize for his work on the telephone, and was looking for another success. With Charles Sumner Tainter and Chichester Alexander Bell (his cousin), he founded the Volta Lab in Washington DC. They went to work on improving the phonograph, which they renamed “the graphophone” in anticipation of distinguishing their inventions from Edison’s. Shakespearealia had already made an appearance in Bell’s career. In 1876, he used a *Hamlet* quote to demonstrate the telephone at the Philadelphia international exposition. His rival Elisha Gray attended and gave this account: “I listened intently for some moments, hearing a very faint, ghostly, ringing sort of sound; but, finally, I thought I caught the words ‘Aye, there’s the rub.’ . . . I turned to the audience, repeating these words, and they cheered.”¹³ A little fragment of Shakespeare proved that the telephone worked. So in 1881, when Bell and his Volta lab colleagues wanted to prove their experimental wax-based sound recording process worked, they again turned again to Shakespearealia: “Trilled r-r-r—There are more things in heaven and earth Horatio, than are dreamed of in our philosophy. r-r-r. I am a Graphophone and my mother was a Phonograph.”¹⁴ Before we can ask what Shakespeare is doing here, we have to understand the work being done by the recording itself, and the machine on which it sits. Here (Figure 1) is a picture of the recording, and of the device it was recorded on, which turn out to be the same thing.



Figure 1. Wax on the first graphophone, author photo.

For students of phonograph history, a narcissism of small differences is apparent here: the device pictured is nothing more than a modified Edison phonograph, with wax poured on the cylinder. This “graphophone” would record sound by using a stylus to inscribe the wax. Since running the stylus back across the indentations would erode the wax quickly, the Volta group decided to try compressed air, whose fluctuations would vibrate a diaphragm that would then transduce the vibrations back into sound. Figure 2 shows the hookup for the tubing and the air compressor (both long gone).



Figure 2. Notecard on the first graphophone, author photo.

This is not a record in the modern sense of the separation of hardware and software. To use contemporary language anachronistically, one could say that the software is permanently joined to the hardware—there is no difference between the two. While Volta had produced a more durable recording surface, they produced one with the same exact problem as Edison’s tin foil: the wax could not be removed from the cylinder without ruining the recording.

When I first encountered this record in 1996, it was not possible to hear what was on the record. But we did know what it was supposed to contain because of paratexts around the recording: a notecard

on the device itself (now faded); and Charles Sumner Tainter's lab notes, home notes, and aborted book manuscript (Figure 3). In other words, in 1996 the recording existed as an articulation of artifacts and recollections. From these, we learn that the recording was made to show off the lab's work to family members, and that it was dictated by Alexander Graham Bell's father, Alexander Melville Bell, who had made his name as an elocutionist: "This record, I believe, was dictated by Prof. A. Melville Bell, on Sept 25th 1881, when we gave an exhibition of the apparatus to Mrs. G. G. Hubbard, Miss Grace B. Hubbard, Mrs. David C. Bell (mother of Chichester A. Bell), Prof. A. Melville Bell, the father of Alexander Graham Bell. The record was of the 'Hill & Valley' form."¹⁵

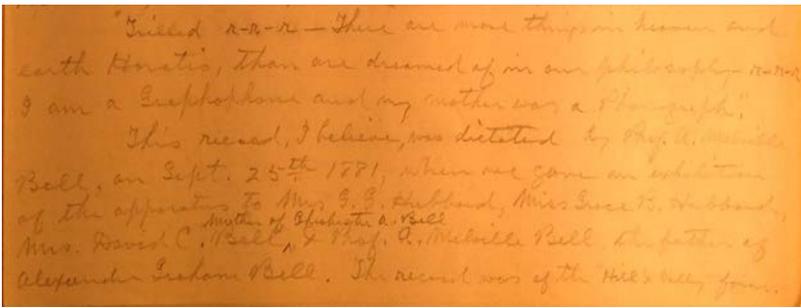


Figure 3. Sumner Tainter's Recollections, photo by Victoria Simon, used with permission.

In Sumner Tainter's recollection, furthermore, the preservation of the recording was also already the subject of concern and comment:

We were also engaged in the preparation of a package we intended to deposit at the Smithsonian Institution, and it was so deposited there on October 20, 1881. This package consisted if my recollection is not at fault, of a tin box, similar to those used in grocery stores at that time, for holding soda crackers. It was, I should say, about 12 inches square and 15 inches high and when deposited it is my recollection that I soldered the lid on the box, so as to make the package airtight, and thus better insure the preservation of the contents.¹⁶

In other words, they expected to get sued, which is not unreasonable given the performative contradiction inherent in the recording itself. The recording/device says "I am a graphophone." But was the device really a graphophone, or was it—to use another anachronism—a clever hack of a phonograph?

As Sumner Tainter intimates, it is a recording and recording device, but also an airtight container designed to guarantee the authenticity of its contents, right down to the signatures on top of the tin box (Figure 4).

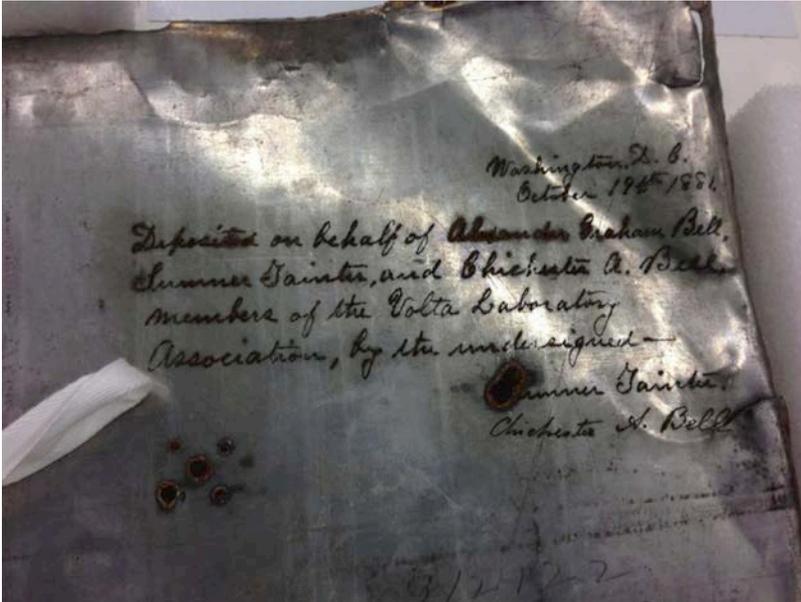


Figure 4. Lid of the Formerly-Sealed Box, author photo.

The sealed box was opened at a ceremony in 1937, and the materials were accessioned at the Smithsonian Institution. By then, the recording was already unplayable, and its contents were guaranteed simply by a faded notecard with a transcription. So here we have a recording testifying to its own authenticity, a testimony twice sealed in wax—once on the recording medium, and once to attach its paratext to the device itself. For a long time this was enough. But in a changing media environment, it eventually became not enough.

In March 2013, Carlene Stephens and a group from the National Museum of American History transported this graphophone to Lawrence Berkeley Labs in California. Using techniques devised by Carl Haber at the lab, they used a laser to scan the recording. Once the laser scan was completed, it was loaded into the computer and the surface was algorithmically interpreted in terms of the sound it would

make if a stylus or air jet were to pass over it. Based on this interpretation, the computer produced a sound file. In other words, Haber, Stephens, and their colleagues played back the recording through an act of mimetic transcoding. Several years later, anyone with a web browser can hear Alexander Melville Bell's declaration ("There are more things in heaven and earth, . . .").¹⁷

Now, we are ready to ask: what the hell is that little fragment of Shakespeare doing on the wax record of a not-yet-graphophone, sealed in a tin box, then unsealed, then laser reconstructed, digitized, and now resounding out of our speakers? As a bit of rhetoric, that quote—first spoken, but then also written down on a card as insurance (and then subsequently backed-up, or doubled, in notes and a memoir)—is a testament to the possibility of sound recording itself. It proves that the graphophone worked. It proves that a voice was there that day. It also proves that Lawrence Berkeley Labs's reconstruction process works. In 1881, in 2016, or in the moment you read this, a *Hamlet* quote proves that the graphophone and the various technologies and practices bound up with it actually work. If listeners hear it and can make out the quote, they are supposed to be convinced that the graphophone can reproduce sound, or that LBL's algorithm reproduces a lost mode of sound reproduction. If nobody can hear the graphophone, then the documentation stands in for hearing, to demonstrate that others were convinced that the graphophone worked. In all cases, the meaning of the *Hamlet* quote is less important than its familiarity and intelligibility. The choice of a quote about unimagined things might lend gravity to the moment of hearing a graphophone for the first time—the fact that the quote would be instantly recognizable for the intended audience would amplify its rhetorical effect. The familiarity of the phrase means that listeners with the right cultural competency can help the technology to do its work of reproduction. Even if the reproduction barely works, if they can catch a fragment of the quote, they know the speaker is reciting from *Hamlet*, and because they know the speaker is reciting from *Hamlet*, they recognize they are hearing a device reproduce sound.

III.

Floppy discs, hard discs; speech and telephones; phonographs, graphophones: in the cases considered so far, Shakespearealia indicate something about a medium as it undergoes a change of phase. Often, one or more phases are unknown to audiences: what will happen

after floppy discs are no longer available? What will happen when it becomes possible to preserve recordings in the long(er) term? Above I used the word “reduce” to describe the rendering of Shakespeare’s work as information, as the content of a medium. But that is not to suggest that Shakespearealia do less work in their form as information. From the perspective of media in moments of phase change, they can do much more work when conceived of as information rather than adaptation. As Gilbert Simondon writes:

Information is not a *term*; it supposes the tension of a system of being in order to receive it adequately. Information can only be inherent to a problematic; it is *that by which the incompatibility of the non-resolved system becomes an organizing dimension in the resolution*; information supposes a *phase change of a system*, because it supposes an initial preindividual state that individuates itself according to the discovered organization.¹⁵

In other words, Shakespearealia help organize dimensions of media (or formats, or other elements of communication technology) as they move from one phase to another. To apprehend Shakespeare across two phases is to experience a phase change in communication: what the telephone does to speech; what the graphophone or floppy disc does to preservation. Shakespearealia link media to other logics of intelligibility in order to make the operations of the media themselves intelligible.

This is true in media theory as well as practice. Consider two reproductions of the same image, a photo of actress Helena Modjeska in costume as Juliet (Figures 5 and 6). The first reproduces an engraving of the photo as it appeared in *Scribner’s Monthly* in March 1879. The second is a reproduction of a 1909 magazine halftone of the same photograph. Both are taken from a rarely remembered (and sadly out of print) classic of media theory: Estelle Jussim’s 1974, *Visual Communication in the Graphic Arts*. Jussim used these two images of Modjeska as Juliet to illustrate the differences between engraving and halftones. She writes that Timothy Cole, the engraver, worked from a photographic portrait printed on a wood block. His was an “ideology of the mezzotinters,” adding in detail where the photograph omitted it, for instance on Modjeska’s right arm (the left of the photo in Figure 5). Realism in engraving was grounded in the interpretation of the engraver. Realism in the halftone was based on the interpretation encoded in a mechanical process—inside a camera, but then also the dot-based printing process that allowed for halftone printing. For Jussim, the two Juliets demonstrate the difference between the two

media forms, two different phases of image reproduction.¹⁹ For her, the switch to halftone was both a formal and a systemic concern: by moving interpretation from the engraver to the machine, halftones allowed for much more rapid and standardized reproduction of photographs in the twentieth century. They were an essential medium of image compression long before the .jpeg and .gif—and these newer protocols share many features with the halftone. Just as image compression has been central to the proliferation of online visual culture, halftones (along with a few other printing processes) made possible the incredible proliferation of images alongside the written word on the printed pages of the twentieth and twenty-first centuries.²⁰ As Jussim wrote, “[T]oday we are so conditioned by photographic technologies that we take for granted that ‘reproductions’ of pictures, whether of line or wash drawings or of oil paintings or photographs, will resemble the originals, but this alteration of perception and expectation represents a true revolution in human communication.”²¹ Juliet’s arm is the proof.

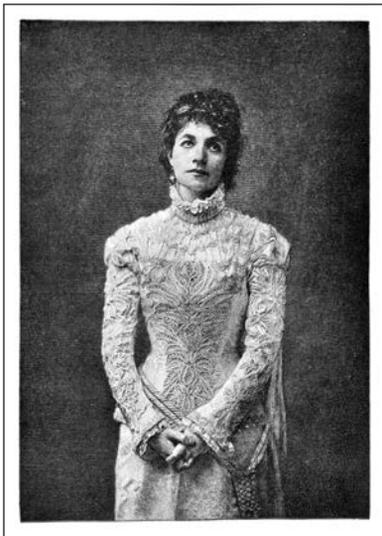


Figure 5. *Juliet Engraved*. From Estelle Jussim, *Visual Communication and the Graphic Arts: Photographic Technologies in the Nineteenth Century* (New York: Bowker, 1974). Reproduced under fair use provisions.

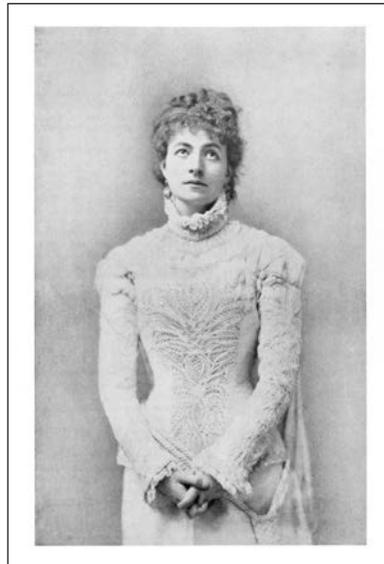


Figure 6. *Juliet Halftoned*. From Estelle Jussim, *Visual Communication and the Graphic Arts: Photographic Technologies in the Nineteenth Century* (New York: Bowker, 1974). Reproduced under fair use provisions.

IV.

It is a hot July day in 2014. I am a half-orc wizard standing in a tavern.²² I look around and see tables with fires, people milling about. I go up to one of them and select “speak.” I am greeted and offered a drink. I speak to another character, she tells me to go talk with the loud, drunk, fat man in the corner. That is when I meet Falstaff (Figure 7).



Figure 7. Screenshot from author's gameplay of *Arden*, summer 2014.

Witty but vague banter about a Prince Harry quickly turns to talk of missions and my own state of poverty. Eventually I follow his suggestion and head to the kitchen to talk with the cook. More missions! Everywhere I turn, missions are offered to me.

Later, I leave the tavern and wander the town. It is empty. Doors are locked. There are few people about. It is night. I go from one place to another, trying to figure out what it is that I should be doing. It goes on like this. I encounter characters, I am offered quests, trades, ways to make money, and not much more. I encounter an old man mashing up Shakespeare quotes (Figure 8): “[A]ll the world's a . . . a . . . the play's the thing.”

I am utterly lost in the world of *Arden*, an incomplete Shakespearean video game. I call in two tech people from the Folger Library, both of whom are gamers. Though much more skilled than me or my research



Figure 8. Screenshot from Author's Gameplay of *Arden*, summer 2014.

assistants, they do not fare much better. We manage to score a lecture on different trades inside a school, and a visit to the country allows us to slay a few wild pigs. We give up.

Arden was created by Edward Castronova and a team of assistants in 2008, with a \$250,000 grant from the MacArthur Foundation. It was supposed to be an experiment in the study of economic behavior. An economist, Castronova made his name by showing that virtual economies, as in Sony's *Everquest*, actually had higher GNPs per capita in "real" currency than countries like Russia or Bulgaria.²³ Castronova hoped to build on this research success by designing a gameworld that would allow him to study economic behavior. But \$250,000 was not even close to enough to design a real game, even on top of another one. Instead, *Arden* is a shell of a video game built on top of the engine of another video game, *Neverwinter Nights*.²⁴ I asked Castronova about his choice of Shakespeare:

JS: Why did you choose Shakespeare for an experimental game intended to study economic behaviour?

TC: There were several reasons. First was my own love of Shakespeare. Second was my feeling that commercial fantasy worlds in games were hollow compared to the worlds already created in literature. Third, I feared backlash from other academics if the lore was seen as frivolous. Fourth, I had a dream that a Shakespeare world might energize an entire campus to contribute.²⁵

Here Castronova recalls worrying about legitimation as an academic enterprise, and how to connect with a group of scholars whom he imagines share some of his own cultural values. Highbrow hopes aside, it is interesting that Castronova also used Shakespearealia as a means to an economic-analytical end. He aimed to create a world to study economic behavior—or at least online economic behavior—by using Shakespearean trappings. The eventual plan for the game was to go online, so that a community would be built around it and many players could interact at once inside the game. Here, we have a case of Shakespearealia not demonstrating the technicity of a communication system, but rather facilitating its social potential. Castronova’s idea was that the Shakespeare material would somehow be more effective than the usual fantasy worlds of games, and if it were carefully crafted with the economist’s experimentalist mind, it could yield more information about economic behavior than existing MMPORGs (Massively Multiplayer Online Role-Playing Games).²⁶

Castronova’s experiment was more formal than technical. But Shakespearealia also animate more technically experimental video games. Consider an experimental multimedia game from 1984, *Deus ex Machina*, (“deyus ex masheena,” as they call it) that came on two cassettes for the ZX spectrum computer in the UK. The ZX was an early successful personal computer in the UK and analog to the Commodore 64 in the United States. Here are the instructions from the packaging:

Load COMPUTER COMPACT-CASSETTE SIDE-ONE into your computer, as if it was a normal computer program.
Play AUDIO COMPACT-CASSETTE SIDE-ONE on a cassette player until the Storyteller instructs you to “PAUSE”. Then pause your audio cassette player.
Press the S key on your computer keyboard, to initialise the Screen Countdown, and re-start your AUDIO cassette exactly when instructed by the Screen. You will witness a slight Accident.
You may control its progress using the following keys:
Q to P “up” or “jump”
A to L “down”
Z to V “left” or “anticlockwise”
B to M “right” or “clockwise”

As Madeleine Akrich has written, technologists make hypotheses about the world into which their technical objects will be inserted: these hypotheses take the form of scripts that users can follow, challenge or modify.²⁷ In the case of *Deus Ex Machina*, these instructions spell out a script that would normally remain mostly implicit, and they must do

so since it was not normal for a video game to be accompanied by a full soundtrack in 1984. As had been the case for reel to reel tape for decades, cassette tape had come to be used for both recording audio and recording computer data, but rarely had the two kinds of tape been bound up in the same cultural object. *Deus Ex Machina* instructs its users in listening to video games in a new way; at the same time, it must also train them in the use of their computers and audio tape decks as integrated systems.

Compared with other games from the period, there are long stretches of just watching and listening, like the interludes one might find between levels in a console game today. Creator Mel Croucher had hoped to produce a game that was less based on killing others and more existential for its players. To give some weight and familiarity to its narrative, Croucher loosely draws its form from the seven ages of man in *As You Like It*:

All the Screen's a stage, and all the men and women merely players. They have their exits and their entrances, and one person in their time plays many parts, their Acts being Seven Ages.

At first the infant mewling in the test tube's neck.

Then the whining School Child, with cassette and shining morning face creeping like a snail unwillingly to databank.

And then the Lover, sighing like a furnace, with a woeful video made to their lovers' hologram.

Then a Soldier, full of strange oaths. Jealous in honor, sudden and quick in quarrel, seeking high score, even in the laser's mouth.

And the Justice, in fair round belly, with eyes severe and clothes of formal cut. Full of wise words and machine code, and so, they play their part.

The Sixth age shifts into the lean and slippered pantaloon. With spectacles on nose, their youthful clothes well saved, a world too wide for their shrunken shank. And their adult speech synthesiser turning again towards a childish treble, piping and whistling in its sound.

Last scene of all that ends this strange, eventful history, is Second Childishness, and mere oblivion, without keyboard, without monitor, without power supply.²⁸

When read as text, the modifications seem simplistic and even a little funny. In the game itself, as read by the actor Jon Pertwee (of *Doctor Who* fame), they are set to an electronic music soundtrack that sounds amazingly up to date—so much so that on first listen I questioned whether the soundtrack was added to the game later on by fans.²⁹ In *Deus Ex Machina*, the Shakespearealia work as a kind of glue, holding

disparate, articulated pieces together. It is hard to know how users engaged with the game at the time—although it was well reviewed, it was not financially successful. But the use of Shakespeare here goes well beyond authorization to articulation, as *Deus Ex Machina* is an attempt to rethink what a video game is, and what it means to play a game.³⁰

v.

We can find this pattern in many different media forms at many different moments. It is perhaps strongest in text-based media, which are of course those most likely to have already been studied for their medial dimensions, both by literary scholars and media scholars. The Internet's text-based media have all been home to performances of Shakespeare that aim to make use of and highlight the specific affordances and practices of the medium. A 1993 performance of *Hamlet* entitled HAMNET used the Internet Relay Chat (IRC) protocol. Already in 1993, a vibrant user community had developed around IRC, a real-time, text-based, transnational protocol that allowed users to chat with one another via their computers and modems.³¹ HAMNET was perhaps a distant relative of Alexander Melville Bell's performance into the graphophone. It simultaneously demonstrated the channel's communicative properties, and connected it with other forms of human communication. Here's a quote from the press release for HAMNET:

True to the concept of theater, the production is presented in real time with live performers and audience, with all the opportunities for spontaneous genius and imminent disaster that entails. The debut performance of "Hamnet" was interrupted by a thunderstorm which cut the producers' online access; the play had to be restarted after the producers logged back in via Taiwan. The second performance was enlivened by a "bot" which accidentally killed Hamlet halfway through the production.³²

As Brenda Danet points out in her study of the performance, these problems actually perform characteristic issues faced by IRC users in the early 1990s, where routings suddenly changed, and where automated processes could interrupt conversations. HAMNET thus also spoofed IRC conventions as well as Shakespearean ones in form as well as content. "Get thee to a nunnery" is rendered as "<Hamlet> Oph: suggest U /JOIN #nunnery."³³

As with IRC, Twitter has had at least two high-profile performances of Shakespeare, both of which were designed to highlight dimensions of the platform, and one of which has attracted some scholarly interest already. *Twitter of the Shrew* appeared in February 2009, over a span of 12 days and 19 Twitter accounts, with the unfortunately popular hashtag #tots. Most reviews questioned the appropriateness of Twitter for Shakespeare—comparing the play to other adaptations. But the blog “Shakespeare Geek” cast the performance in exactly the phase-change terms so common for Shakespearealia: “[T]hey chose a play about relationships and gossip and stereotypes, exactly paralleling the Twitterverse”³⁴ In other words, *Twitter of the Shrew* was designed not to provide a path into Shakespeare, but a path into Twitter.

Maurizio Calbi devotes an entire chapter of his book *Spectral Shakespeares* to a 2010 performance of *Romeo and Juliet* by the Royal Shakespeare Company entitled *Such Tweet Sorrow*. Considering it as an adaptation, Calbi is especially concerned with the “haunting” dimensions of Shakespeare’s language in a performance of the play that is otherwise almost entirely in the vernacular of Twitter. Drawing on insights of Lev Manovich and Mark Hansen that show how content in new media and social media is often tokenistic, as much about the fact of conversation as about the news, narrative or external reference it is said to contain, Calbi is concerned with whether Shakespeare is simply reduced to “content” by the Twitter context. He wonders whether

the ‘Shakespearean’ tweet is just as significant—or just as insignificant—as the vernacular tweet, or a picture on Twitpics, or a video on YouTube, or audio file on Audioboo. They all function as post-hermeneutic ‘tokens’ in a conversation—a *dramatic* conversation, in this case—that takes place not only among characters but also between each character and his/her followers, as well as among the followers themselves.³⁵

For Calbi, the answer is and must be no, because of the animating and structuring absence of the Shakespearean work, the logic of haunting that he returns to throughout the book. For a work concerned with adaptation, this makes sense, but for a media theory, this answer runs a little too close to the idea of an author’s intent driving meaning, or that the oeuvre exerts a force on its own. Again, as with Shakespearealia in general, the reduction to mere content is not a reduction at all—the reduction allows fragments to do certain kinds of cultural work. Thus, it must both matter and not matter that *Such Tweet Sorrow* references Shakespeare. The performance is, as Calbi notes, at least as much about Twitter as it is about the play.

Characters are self-conscious about their presence on Twitter, and their performance is meant in part to dramatically flesh out and highlight aesthetic dimensions of the platform. At the same time, its status as Shakespearealia refers back not to the work but to a loose network of references, as tweets themselves so often do. From a standpoint of language study or interaction, no tweet is just a token, and from a standpoint of materialism, no token is just like any other. It is not necessarily the play or the work that *Such Tweet Sorrow* refers back to, it is rather the shifting field of references with which the tweets, the performers, and the followers found themselves engaged.

VI.

I end with a gloss on a few examples of Shakespearealia in the advertising and promotion of new media. DuMont ran a 1944 ad for television with the tagline “Verily Mr. Shakespeare, All the world’s a stage . . . with television!”³⁶ *Puck* magazine, the first successful US weekly with color images and advertisements—a pair of technical-industrial developments deeply tied to one another—ran a quote from *A Midsummer Night’s Dream* across its masthead: “[W]hat fools these mortals be!”³⁷ Early public performances of the phonograph demonstrated its power and contours by pitch shifting Shakespeare:

Mr. Edison then said to the instrument, “Now is the winter of our discontent made glorious summer,” etc. Turning the crank slowly a Richard was heard to speak with deep and diabolic voice. Turning the crank rapidly, the same words were heard in a shrill and petulant voice, as though Richard was in a bad humor and did not care to play his part.³⁸

Shakespeare performances appear on radio as early as 1922 and 1923 and are presented as demonstrating the potential of the medium.³⁹ And Shakespearealia decorate a monument to the west Australian terminus of the transpacific cable, which facilitated global telecommunications in the 1950s: the significance of the cable and terminus is hailed by a line from *The Tempest* (Figure 9): “I’ll put a girdle round about the earth in forty minutes.”⁴⁰



Figure 10. The Bard Card, courtesy the payments council, UK. Used with permission.

Whatever claims we want to make about the material force of technological mediation, in the human stratum, it seems that those mediations reveal themselves through cultural materials.⁴³ If emergent media tend to emerge as Shakespeare-processing machines, that means that before they can be said to manifest any kind of technocultural logic, they can only do so by passing through culture, a culture that is temporary, contingent, and constantly changing.⁴⁴ And media depend on materials with which to test and demonstrate their mediality, either as reference materials or as platforms for performance. Because of their usefulness and potential for semantic promiscuity, Shakespearealia expand Marshall McLuhan's old dictum that the content of a new medium is an old medium. They are chaotic in their references, and they refer not only to other media, but also to whole use histories and vaguely received cultural narratives. If media do Shakespeare processing, we can also say that Shakespearealia are collections of little media processing techniques. In advancing this argument I hope to have demonstrated how even the most brute technical processes cannot exist for people without cultural materials to process, even if those cultural materials are ordinary in Raymond Williams's sense. The Shakespearealia of media history are not exactly literature, and they are certainly not best understood through reference to "great literature." But they were necessary for users to imagine new media forms as themselves great human achievements.

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NOTES

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Epigraph quotes are from, respectively: IBM, "British Library and Koninklijke Bibliotheek (Netherlands) Choose IBM Solution to Preserve National Digital Heritage," Press Release, 19 October 2000, <http://www.thefreelibrary.com/BRITISH+LIBRARY+AND+KONINKLIJKE+BIBLIOTHEEK+%28NETHERLANDS%29+CHOOSE+IBM...-a066204056http://news.bbc.co.uk/2/hi/uk/2905953.stm>; and "R. I. P. Floppy Disk," *BBC News*, 1 April 2003, <http://news.bbc.co.uk/2/hi/uk/2905953.stm>.

¹ Lawrence Levine, *Highbrow/Lowbrow: The Emergence of Cultural Hierarchy in America* (Cambridge: Harvard Univ. Press, 1988).

² Clara Calvo, "Fighting over Shakespeare: Commemorating the 1916 Tercentenary in Wartime," *Critical Survey* 24.3 (2012); Monika Smialkowska, "Mobilizing Shakespeare During the Great War," *Shakespeare Quarterly* 10, no. 3 (2014).

³ Zachary Lesser and Peter Stallybrass, "The First Literary Hamlet and the Commonplacings of Professional Plays," *Shakespeare Quarterly* 59.4 (2008): 376.

⁴ Robert Babcock, *The Genesis of Shakespeare Idolatry, 1766–1799: A Case Study in English Criticism of the Late 18th Century* (Chapel Hill: Univ. of North Carolina Press, 2013).

⁵ Alexis de Tocqueville, *Democracy in America*, trans. Harry Reeve (1831; repr. State College: Penn State Electronic Classics, 2010), 535.

⁶ See Friedrich Kittler, *Gramophone-Film-Typewriter*, trans. Geoffrey Winthrop-Young and Michael Wutz (Stanford: Stanford Univ. Press, 1999), 4, 12; and Geoffrey Winthrop-Young, *Kittler and the Media* (Cambridge: Polity, 2011), 59.

⁷ Richard Burt, "Introduction: Shakespeare, More or Less? From Shakespearecentricity to Shakespearecentricity and Back," in *Shakespeares After Shakespeare: An Encyclopedia of the Bard in Mass Media and Popular Culture*, ed. Richard Burt (Westport: Greenwood, 2007), 3.

⁸ Surveying recent work on Shakespeare and media, like the 2010 issue of *Shakespeare Studies*, I get a sense this is still the prevailing sensibility in the field when mediality is considered. See, for example, Greg Colón Semenza's introduction to that issue: "Introduction," *Shakespeare Studies* 38.1 (2010). Even Maurizio Calbi, in his otherwise militantly Derridean *Spectral Shakespeares*, winds up using a concept of adaptation. He attacks the unitary conception of Shakespeare, exploding Richard Burt's idea of media pluralizing "Shakespeares" into thousands of Derridean specters. But then he brings it back to adaptation as the central activity through which media should be understood. See Maurizio Calbi, *Spectral Shakespeares: Media Adaptations in the 21st Century* (New York: Palgrave, 2013), 2, 5; Burt, "Introduction: Shakespeare, More or Less?," 3.

⁹ Dylan Mulvin, "Reference Materials: The People, Places, and Things of Making Measurements" (PhD Diss., McGill University, 2016).

¹⁰ Brindley also (perhaps unintentionally) performs a classic theatrical superstition as well: if saying "Macbeth" inside a theater is destined to cause disaster for the production or death for one of its stars, is the "Macbeth" most valuable when it measures a dying media form? Thanks to Li Cornfeld for this point.

¹¹ Lisa Gitelman, *Always Already New: Media, History and the Data of Culture* (Cambridge: MIT Press, 2006), 31, 37. Of phonograph exhibitions, Gitelman writes that "exhibitors made incongruous associations between well-known lines from both Shakespeare and Mother Goose, between talented musicians and hacks like Edward Johnson, between animal and baby noises and the articulate sounds of speech. Audiences could draw and maintain their own distinctions, laugh at the appropriate moments, recognize impressions, and be in on the joke. They could participate together in the enactment of cultural hierarchy" (37). Recognition thus served two roles: to perform that the medium worked, and that it worked well enough that audience members' cultural judgments could be put into effect.

¹² Andre Millard, *Edison and the Business of Innovation* (Baltimore: Johns Hopkins Univ. Press, 1990).

¹³ Robert V. Bruce, *Bell: Alexander Graham Bell and the Conquest of Solitude* (Boston: Little, Brown, 1973), 197.

¹⁴ Charles Sumner Tainter, Home Notes, Charles Sumner Tainter Papers, 1881, July 3–November 19, Archives Center, National Museum of American History, Smithsonian Institution, box 1, folder 3.

¹⁵ Charles Sumner Tainter, “The Talking Machine,” Charles Sumner Tainter Papers, 1878–1919, Archives Center, National Museum of American History, Smithsonian Institution, box 1, folder 4, page 20 of manuscript.

¹⁶ Sumner Tainter “The Talking Machine,” page 20 of manuscript.

¹⁷ As of May 2016, the recording can be found at: <http://bio16p.lbl.gov/volta-release-2013.html> and scrolling down to “Cat. No 312123, full recording raw.” Links are notoriously unstable, so as this article ages, readers will likely have to go searching for it. As Lisa Gitelman has argued in *Always Already New* (132), the 404 error is the most common page on the World Wide Web, a constitutive feature of its mediatic landscape.

¹⁸ Gilbert Simondon, “The Position of the Problem of Ontogenesis,” *Parrhesia* 7 (2009): 10, emphasis in original.

¹⁹ Estelle Jussim, *Visual Communication and the Graphic Arts: Photographic Technologies in the Nineteenth Century* (New York: R. R. Bowker, 1974), 59–61.

²⁰ Ulrich Keller, “Photojournalism Around 1900: The Institutionalization of a Mass Medium,” in *Shadow and Substance: Essays on the History of Photography in Honor of Heinz K. Henisch*, ed. Kathleen Collins (Bloomfield Hills: Amorphous Institute Press, 1990); Richard Ohmann, *Selling Culture: Magazines, Markets and Class at the Turn of the Century* (New York: Verso, 1996), 234–39; Kevin G. Barnhurst and John C. Nerone, *The Form of News: A History* (New York: Guilford, 2001), 19; Neil Harris, “Iconography and Intellectual History: The Halftone Effect,” in *Cultural Excursions: Marketing Appetites and Cultural Tastes in Modern America*, ed. Neil Harris (Chicago: Univ. of Chicago Press, 1990).

²¹ Jussim, 61.

²² Gamers tell me this is a terrible combination. My character had barely enough intelligence points—10—to cast spells.

²³ Edward Castronova, “Virtual Worlds: A First-Hand Account of Market and Society on the Cyberian Frontier.” *CESifo Working Paper No. 618* (December 2001). Available online at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=294828.

²⁴ Edward Castronova, “A Test of Law of Demand in a Virtual World: Exploring the Petri Dish approach to Social Science,” *CESifo Working Paper No. 2355* (Category 10: Empirical and Theoretical Methods, July 2008). Available online at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1173642.

²⁵ Castronova, e-mail exchange with author, 14 July 2014.

²⁶ The most robust studies of MMPORGs seem to come from more ethnographically based participant-observer approaches that enter existing worlds, rather than creating experimental ones. Even Castronova’s most famous work comes from his study of existing games. See, for example, T. L. Taylor, *Play Between Worlds: Exploring Online Game Culture* (Cambridge: MIT Press, 2006); and Thomas M. Malaby, *Making Virtual Worlds: Linden Lab and Second Life* (Ithaca: Cornell Univ. Press, 2009).

²⁷ Madeleine Akrich, “The De-Description of Technical Objects,” in *Shaping Technology, Building Society: Studies in Sociotechnical Change*, ed. Wiebe Bijker and J. Law (Cambridge: MIT Press, 1992), 207–8.

²⁸ For a fuller description of the gameplay, see: <http://www.zzap64.co.uk/zzap10/deus.html> or the video at: <https://www.youtube.com/watch?v=vwJBSYJ16IE>; Mel Croucher, *Deux Ex Machi The Best Game You’ve Never Played in Your Life* (Luton: Andrews, 2014), 87–88.

²⁹ It should be stressed that the reason for my reaction has to do with the popularity of synthesizers used during the 1980s for contemporary music: the packaging credits Mel Croucher with the use of a Roland 808 drum machine and JXP synthesizer, among other instruments; these two instruments are now canonized, heavily imitated and command surprisingly high prices on the used market.

³⁰ Jennifer Daryl Slack and J. Macgregor Wise, *Culture and Technology: A Primer*, 2nd ed. (New York: Peter Lang, 2014).

³¹ Early Internet studies scholars like Sherry Turkle hailed the relative anonymity and identity play that was possible on chat platforms like IRC. See Sherry Turkle, *Life on the Screen: Identity in the Age of the Internet* (New York: Simon and Schuster, 1995). The protocol remains in use today, and is important for groups like Anonymous because it lacks many of the more firmly fixed and commercialized identity-based protocols of later web and social media platforms. See Gabriella Coleman, *Hacker, Hoaxer, Whistleblower, Spy: The Many Faces of Anonymous* (London: Verso, 2014).

³² Brenda Danet, *Cyberpl@y: Communicating Online* (New York: Berg, 2001), 109–10.

³³ Danet, 131.

³⁴ Quote from “Shakespeare Geek,” 12 February 2009, <http://blog.shakespearegeek.com/2009/02/twitter-of-shrew.html>. The *Columbia Journalism Review* was especially harsh: “Hey, did you hear that sound? That dull, rumbling-but-kinda-squeaky noise, echoing and mournful and punctuated with a gaping groan? If so, don’t worry too much . . . it’s probably just Shakespeare rolling in his grave.” Megan Garber, “The Twitter of the Shrew. No. Seriously,” http://www.cjr.org/the_kicker/the_twitter_of_the_shrew_no_se.php). See also Stan Schroeder, “Shakespeare and Twitter Make an Odd Couple,” <http://mashable.com/2009/02/12/shakespeare-twitter/>.

³⁵ Calbi, 152.

³⁶ DuMont Laboratories, “All the World’s a Stage . . . With Television,” *The New Yorker*, 24 June 1944, 14.

³⁷ The satire magazine had a long and successful run, and paved the way for many other commercial magazines that would follow in its wake; collectively, they were central to the formation of the modern middle class at the turn of the twentieth century. See Ohmann, *Selling Culture*.

³⁸ An 1878 *New York Times* report quoted in Patrick Feaster, “‘A Compass of Extraordinary Range’: The Forgotten Origins of Phonomanipulation,” *ARSC Journal* 42.2 (2011): 168.

³⁹ WJZ Program Listings, *Washington Post*, 17 December 1922. See also Daniel Yezbick, “Free Will: Orson Welles and the Remediation of American Shakespeare 1930–48” (PhD Diss., Univ. of Illinois, Urbana-Champaign, 2004).

⁴⁰ For more on undersea cables and the theory of infrastructure, see Nicole Starosielski, *The Undersea Network* (Durham: Duke Univ. Press, 2015).

⁴¹ “Face of the Bard to Decorate Bank Cash Cards,” *Associated Press*, 9 September 1988, <http://www.apnewsarchive.com/1988/Face-of-the-Bard-to-Decorate-Bank-Cash-Cards/id-2d4ed627d5f8fe050d483f429db6769c>.

⁴² Matthew Kirschenbaum, *Mechanisms: New Media and the Forensic Imagination* (Cambridge: MIT Press, 2008), 86.

⁴³ For recent examples, see Lisa Gitelman, *Paper Knowledge: Towards a Media History of Documents* (Durham: Duke Univ. Press, 2014); Jacob Smith, *Eco-Sonic Media* (Berkeley: Univ. of California Press, 2015); Starosielski, *The Undersea Network*; and Mark B. N. Hansen, *Feed Forward: On the Future of Twenty-First Century Media* (Chicago: Univ. of Chicago Press, 2015).

⁴⁴Jennifer Daryl Slack, "The Theory and Method of Articulation in Cultural Studies," in *Stuart Hall: Critical Dialogues*, ed. David Morley and Kuan-Hsing Chen (New York: Routledge, 1996); Slack and Wise, *Culture and Technology*. See also, in this issue, Wendy Chun, "Big Data as Drama," 363–82.