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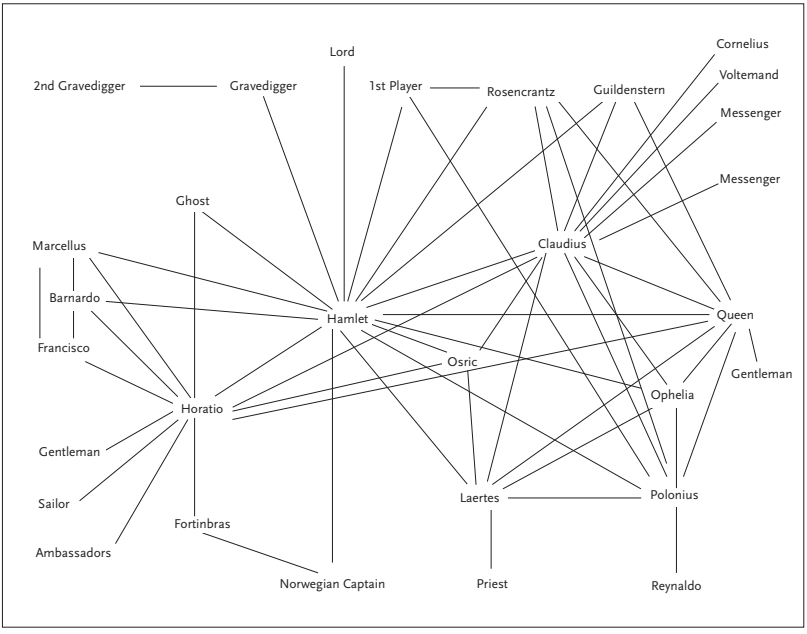
NETWORK THEORY, PLOT ANALYSIS

In the last few years, literary studies have experienced what we could call the rise of quantitative evidence. This had happened before of course, without producing lasting effects, but this time it is probably going to be different, because this time we have digital databases and automated data retrieval. As a recent article in *Science* on 'Culturomics' made clear, the width of the corpus and the speed of the search have increased beyond all expectations: today, we can replicate in a few minutes investigations that took a giant like Leo Spitzer months and years of work.[1] When it comes to phenomena of language and style, we can do things that previous generations could only dream of.

When it comes to language and style. But if you work on novels or plays, style is only part of the picture. What about plot—how can that be quantified? This paper is the beginning of an answer, and the beginning of the beginning is network theory. This is a theory that studies connections within large groups of objects: the objects can be just about anything—banks, neurons, film actors, research papers, friends . . .—and are usually called nodes or vertices; their connections are usually called edges; and the analysis of how vertices are linked by edges has revealed many unexpected features of large systems, the most famous one being the so-called 'small-world' property, or 'six degrees of separation': the uncanny rapidity with which one can reach any vertex in the network from any other vertex. The theory proper requires a level of mathematical intelligence which I unfortunately lack; and it typically uses vast quantities of data which will also be missing from my paper. But this is only the first in a series of studies we're doing at the Stanford Literary Lab; and then, even at this early stage, a few things emerge.

FIGURE 1. *The* Hamlet *network*



Character-Network

A network is made of vertices and edges; a plot, of characters and actions: characters will be the vertices of the network, interactions the edges, and this is what the *Hamlet* network looks like: Figure 1.[2] There are some questionable decisions here, mostly about *The Murder of Gonzago*, but, basically, two characters are linked if some words have passed between them: an interaction is a speech act. This is not the only way to do things, the authors of a previous paper on Shakespeare had linked characters if they had speaking parts during the same scene, even if they did not address each other: so, for instance, for them the Queen and Osric are linked (because they both have speaking parts, and are on stage together

[1] Jean-Baptiste Michel, Erez Lieberman Aiden et al., 'Quantitative Analysis of Culture Using Millions of Digitized Books', *Science*, December 2010.

[2] As will become clear from the text, the visual evidence relevant to this article can easily be increased to fifty or more images; the full series can be found on the website of Stanford's Literary Lab (litlab.stanford.edu).

in the last scene of the play), whereas here they are not, because they don't speak to each other.[3] My network uses explicit connections, theirs adds implicit ones, and is obviously denser, because it has all of my edges plus some; both are plausible, and both have at least two flaws. First, the edges are not 'weighted': when Claudius tells Horatio in the graveyard scene, 'I pray thee, good Horatio, wait upon him', these eight words have in this figure exactly the same value as the four *thousand* words exchanged between Hamlet and Horatio. This can't be right. And then, the edges have no 'direction': when Horatio addresses the Ghost in the opening scene, his words place an edge between them, but of course that the Ghost would not reply and would speak only to Hamlet is important, and should be made visible.[4] But, I just couldn't find a non-clumsy way to visualize weight and direction; and turning to already-existing software didn't help, as its results are often completely unreadable. So, the networks in this study were all made by hand, with the very simple aim of maximizing visibility by minimizing overlap. This is not a long-term solution, of course, but these are small networks, in which intuition can still play a role; they're like the childhood of network theory for literature; a brief happiness, before the stern adulthood of statistics.

Anyway. Four hours of action, that become this. Time turned into space: a character-*system* arising out of many character-*spaces*, to use Alex Woloch's concepts in *The One vs the Many*. Hamlet's space, Figure 2: in bold, all the direct links between him and other characters; Hamlet and Claudius,

[3] 'The network structure calculations were obtained by treating each speaking character as a vertex, and deeming two characters to be linked if there was at least one time slice of the play in which both were present (that is, if two characters spoke to each other or were in each other's presence, then they have a link)': James Stiller, Daniel Nettle, Robin I. M. Dunbar, 'The small world of Shakespeare's plays', *Human Nature*, vol. 14, no. 4, 2003, p. 399. Another application of network theory to narrative ('Marvel Universe looks almost like a real social network', by R. Alberich, J. Miro-Julia, F. Rosselló, 11 February 2002, available at arXiv.org) uses a similar premise, by stating that 'two characters are linked when they jointly appear in a significant way in the same comic book'; since, however, we are never told what exactly constitutes a 'significant' interaction, as opposed to an in-significant one, the basis for quantification remains fundamentally opaque.

[4] The reason weight and direction are particularly important in literary networks is that, whereas the systems studied by network theory have easily thousands or millions of vertices, whose relevance can be directly expressed in the number of connections, plots have usually no more than a few dozens characters; as a consequence, the mere existence of a connection is seldom sufficient to establish a hierarchy, and must be integrated with other measurements.

FIGURE 2. *Hamlet's space*

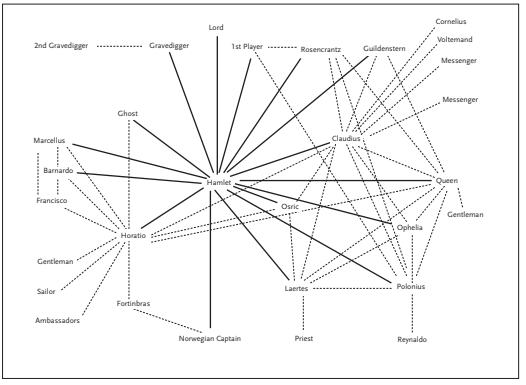


FIGURE 3. *Hamlet and Claudius*

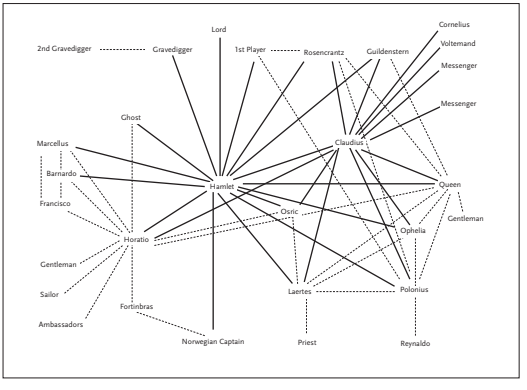


FIGURE 4. *Gertrude and Ophelia*

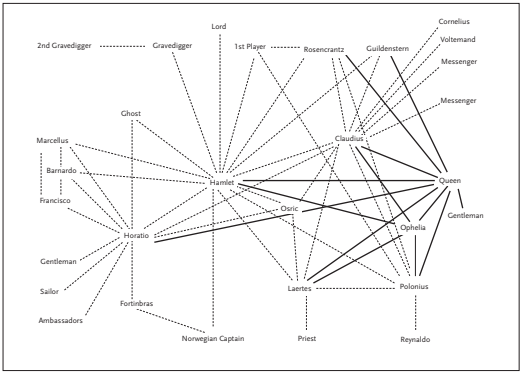


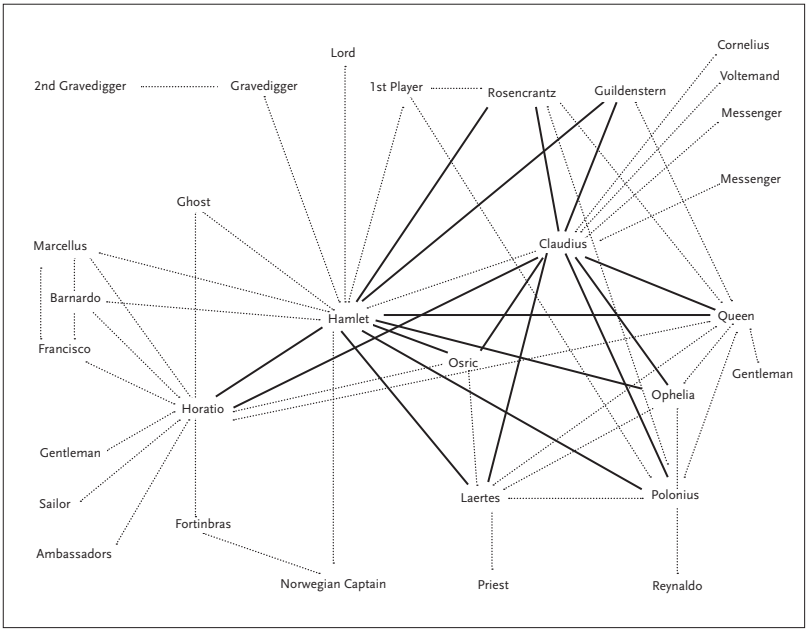
Figure 3: see how much of the network they capture, between the two of them. Ophelia and Gertrude, Figure 4: the much smaller space of the two women in the play. And so on. But before analysing spaces in detail, why use networks to think about plot to begin with? What do we gain, by turning time into space? First of all, this: when we watch a play, we are always in the present: what is on stage, is; and then it disappears. Here, nothing ever disappears. What is done, cannot be undone. Once the Ghost shows up at Elsinore things change forever, whether he is on scene or not, because he is never not there in the network. The past becomes past, yes, but it never disappears from our perception of the plot.

Making the past just as visible as the present: that is one major change introduced by the use of networks. Then, they make visible specific 'regions' within the plot as a whole: sub-systems, that share some significant property. Take the characters who are connected to both Claudius and Hamlet in Figure 5: except for Osric and Horatio, whose link to Claudius is however extremely tenuous, they are all killed. Killed by whom, is not always easy to say: Polonius is killed by Hamlet, for instance—but Hamlet has no idea that it is Polonius he is stabbing behind the arras; Gertrude is killed by Claudius—but with poison prepared for Hamlet, not for her; Hamlet is killed by Laertes, with Claudius's help, while Laertes himself, like Rosencrantz and Guildenstern before him, are all killed by Hamlet, but with Claudius's weapons. Individual agency is muddled; what is truly deadly, is the characters' position in the network, chained to the warring poles of king and prince. Outside of that bold region, no one dies in *Hamlet*. The tragedy, is all there.

Models, experiments

Third consequence of this approach: once you make a network of a play, you stop working on the play proper, and work on a *model* instead. You reduce the text to characters and interactions, abstract them from everything else, and this process of reduction and abstraction makes the model obviously much less than the original object—just think of this: I am discussing *Hamlet*, and saying nothing about Shakespeare's words—but also, in another sense, much *more* than it, because a model allows you to see the underlying structures of a complex object. It's like an X-ray: suddenly, you see the region of death of Figure 5, which is otherwise hidden by the very richness of the play. Or take the protagonist. When discussing this figure, literary theory usually turns to concepts of

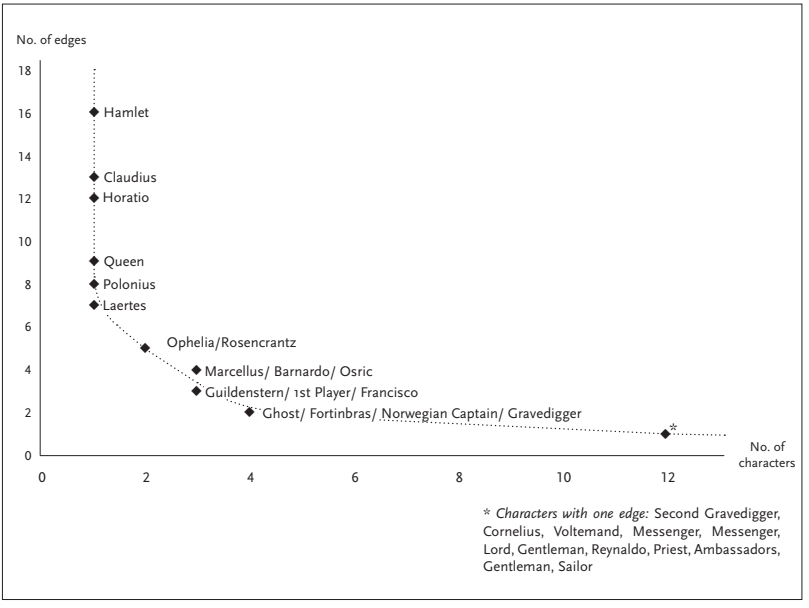
FIGURE 5. Hamlet*: the region of death*



'consciousness' and 'interiority'—even Woloch's structural study takes this path. When a group of researchers applied network theory to the Marvel comics series, however, their view of the protagonist made no reference to interiority; the protagonist was simply 'the character that minimized the sum of the distances to all other vertices';[5] in other words, the *centre* of the network. In their case, it was a character called Captain America; in ours, it is Hamlet. One degree of separation from 16 of the characters; two degrees from the others; average distance from all vertices in the network, 1.45. And if we visualize these results in the form of a scatter-plot, Figure 6 (overleaf), we find the power-law distribution that is characteristic of all networks: very few characters with many edges on the left, and very many characters with just one or two edges on the right. The result is the same if we add all the characters from *Macbeth, Lear* and *Othello*. Power-law is the opposite of a Gaussian curve: there is no central tendency in the distribution, no 'average'; that is to say, there is no 'typical' vertex in the network, *and no typical character in the*

[5] Alberich, Miro-Julia and Rosselló, 'Marvel Universe'.

FIGURE 6. *Centrality in* Hamlet



plays. So, speaking of Shakespeare's characters 'in general' is wrong, at least in the tragedies, because these characters-in-general don't exist: all there is, is this curve leading from one extreme to the other without any clear solution of continuity. And the same applies to the binaries with which we usually think about character: protagonist versus minor characters, or 'round' versus 'flat': nothing in the distribution supports these dichotomies; what it asks for, rather, is a radical reconceptualization of characters and of their hierarchy.

What is done is never undone; the plot as a system of regions; the hierarchy of centrality that exists among characters; finally—and it is the most important thing of all, but also the most difficult—one can *intervene* on a model; make experiments. Take the protagonist again. For literary critics, this figure is important because it is a very meaning-ful part of the text; there is always a lot to be said about it; we would never think of discussing *Hamlet*—without Hamlet. But this is exactly what network theory tempts us to do: take the *Hamlet*-network, and *remove* Hamlet, to see what happens: Figure 7. And what happens is that the network almost

FIGURE 7. Hamlet *without Hamlet*

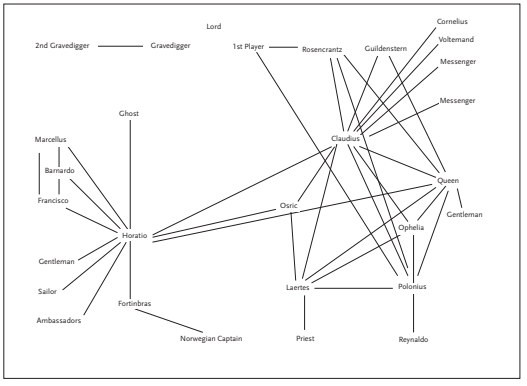


FIGURE 8. Hamlet *without Claudius*

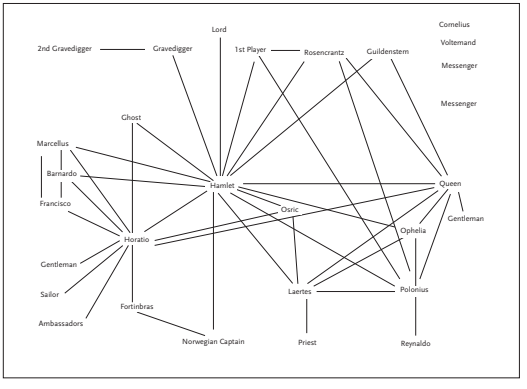
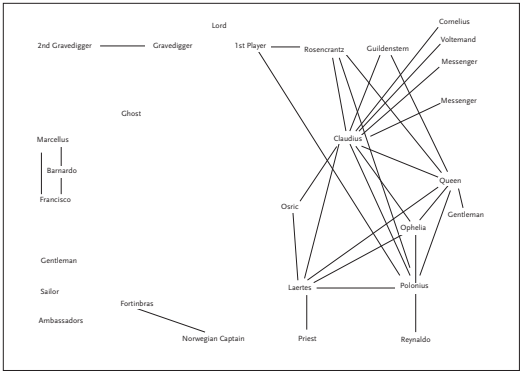


FIGURE 9. Hamlet *without Hamlet and Horatio*



splits in half: between the court on the right, and the region that includes the Ghost and Fortinbras on the left all that remains are the three edges linking Horatio to Claudius, Gertrude and Osric: a few dozen words. If we used the first Quarto, the breakdown would be even more dramatic.

Why is the protagonist significant here? Not for what is 'in' it; not for its essence, but for its function in the stability of the network. And stability has clearly much to do with centrality, but is not identical to it. Take the second most central character of the play: Claudius. In quantitative terms, Claudius is almost as central as Hamlet (average distance of 1.62, versus 1.45); but in structural terms not so, when we remove him from the network, Figure 8, what happens is that a handful of peripheral characters are affected, but the network as a whole not much. Even if we remove, first Hamlet, and then Claudius, his subtraction does not do much. But if we remove, first Hamlet, and then Horatio, Figure 9, then the fragmentation is so radical that the Ghost and Fortinbras—which is to say, the beginning and the ending of the play—are completely severed from each other and from the rest of the plot. *Hamlet* no longer exists. And yet, Horatio is slightly less central than Claudius in quantitative terms (1.69 versus 1.62). Why is he so much more important in structural terms?

Centrality, conflict, clustering

Let me take a brief step back, and add something on Hamlet's centrality first. Shakespeare's major tragedies are reflections on the nature of sovereignty, in which an initial figure of legitimacy is ousted by a usurper, who is in his turn defeated by a second figure of legitimacy. But there are differences. In *Macbeth* and *Lear* legitimate rulers have very solid connections to the rest of the network: Duncan and Malcolm (in grey and bold), Figure 10, have a powerful antagonist in Macbeth (dots), but the two fields are basically balanced; and this is even truer for *Lear*, with its scattering of sovereign power, Figure 11. In *Hamlet*, no: between old Hamlet and Fortinbras on one side and Claudius on the other there is a total disproportion; the usual balance of power is not there,[6] and Hamlet finds himself caught between the space of the Court and that of the anti-Court: the soldiers who still remember the old king, the ghost, the Norwegian

[6] *Why* the balance is not there—why choose a ghost and a Norwegian as figures of legitimacy—is a different question, on which network theory has probably nothing to say. *That* it is not there, is one of those things that it makes visible.

FIGURE 10. *Sovereignty and Legitimacy in* Macbeth

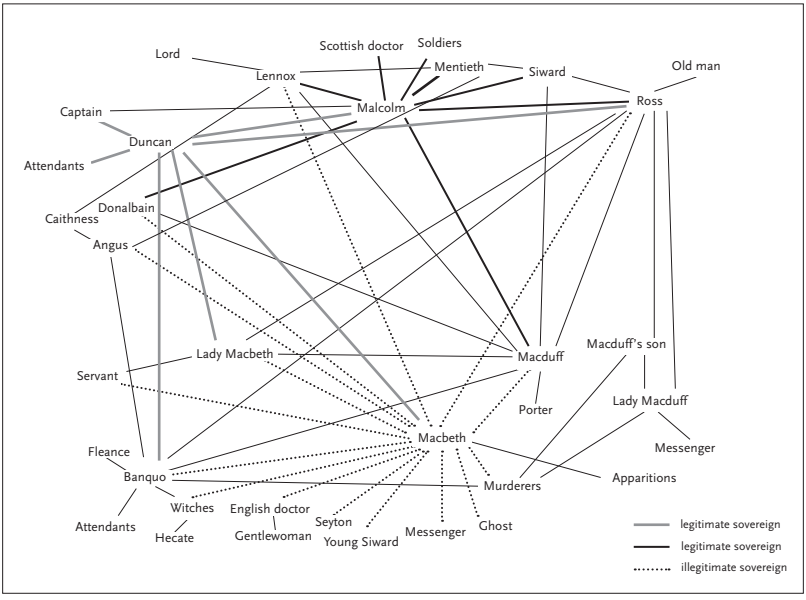


FIGURE 11. *Sovereignty and Legitimacy in* King Lear

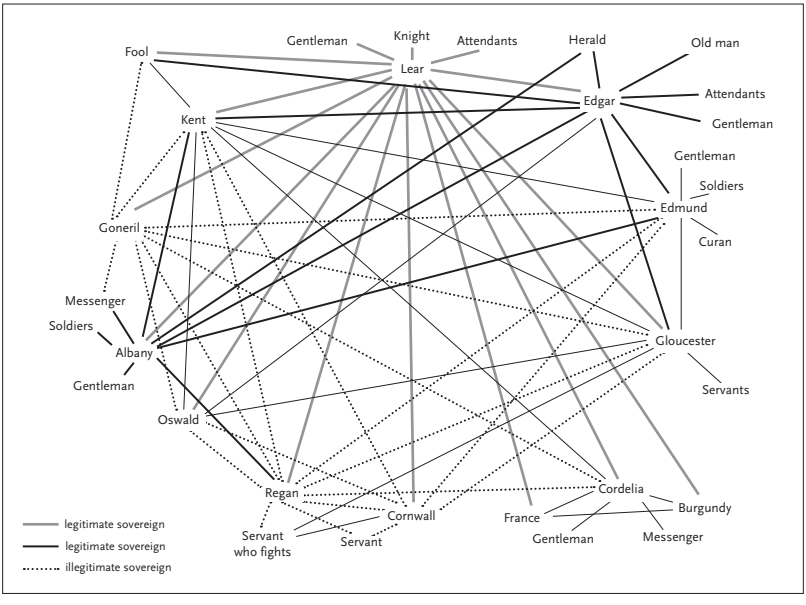


FIGURE 12. Hamlet *1.2: the two poles of the play*

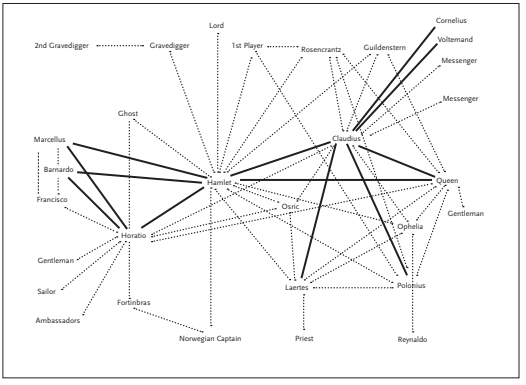


FIGURE 13. Hamlet *III.2*

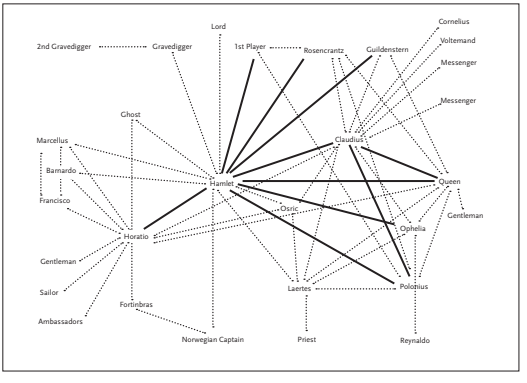
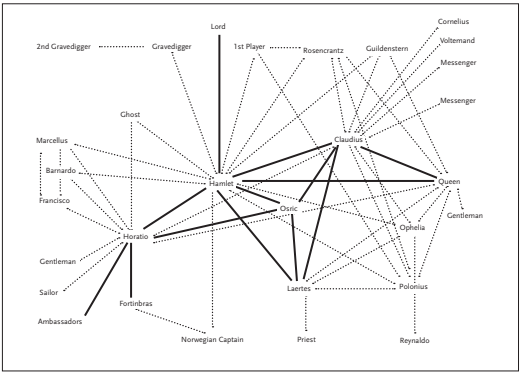


FIGURE 14. Hamlet *V.2*



pretender, the carnivalesque of the Gravedigger. It's a duality that emerges in all the great Court scenes, from that which sets up the pattern in Act I, Figure 12, to the arrival of the players, the play within the play, Figure 13, and the two final scenes of the tragedy, Figure 14. Always two hubs in the network: Claudius inside the Court, and Hamlet (half-)outside it.

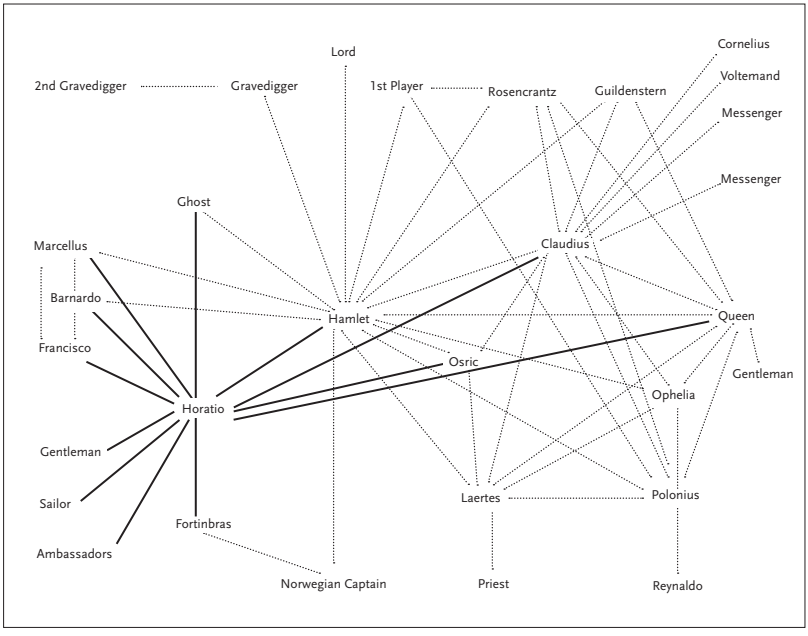
Claudius inside the Court . . . This is the densest part of the network: the hexagon formed by Hamlet, Claudius, Gertrude, Polonius, Ophelia and Laertes, where everybody is connected to everybody else, and clustering reaches 100 per cent. Clustering is a technical concept of network theory, which Mark Newman explains thus: 'If vertex A is connected to vertex B and vertex B to vertex C, then there is a heightened probability that vertex A will also be connected to vertex C. In the language of social networks, the friend of your friend is likely also to be your friend.'[7] This is what clustering means: A and C connect, the triangle closes, and when that happens the resilience of that part of the network increases. *And this is why removing Claudius has such little effect on the network*: he belongs to a region which is already very interconnected, and that remains just as solid with or without him.[8]

Horatio is the opposite: he inhabits a part of the network where clustering is so low, Figure 15 (overleaf), that, without him, it disintegrates. In this, he is a good gateway to the region that is the exact antithesis of the 100 per cent clustering of the Court: the periphery of *Hamlet*, where we find the *least* connected of its characters—those with just one link to the network; at times, just one sentence. Very little. But as a group, these peripheral characters do something unique: they point to

[7] Newman, 'The structure and function of complex networks', *SIAM Review*, vol. 45, no. 2, 2003, p. 183; available on arXiv.org.

[8] Hamlet also belongs to the hexagon, of course; but although he shares those five edges with Claudius (plus that to Horatio, and to those other Court creatures, Rosencrantz, Guildenstern and Osric), their remaining edges are quite different: in Claudius's case, they link him to minor characters who are emanations of the Court, and hence add nothing to his role in the structure; in Hamlet's case, they lead into other regions of the play, increasing his structural significance. Moreover, whereas Hamlet's exchanges with the five Court characters amount only to 28 per cent of the words he speaks in the play; in Claudius's case—though he barely speaks to Ophelia, and not much to Polonius, either—the figure rises to 48 per cent (or 60 per cent, if we include his speeches to the Court as a whole): in other words, most of Claudius's verbal energy is spent within this very small circle. This is one case where 'weighting' the edges would significantly modify the initial X-ray of *Hamlet*.

FIGURE 15. *The Horatio network*



the world *beyond Elsinore*: the gentleman, sailor and ambassadors who speak to Horatio, and one of the messengers to Claudius, are links to the 'English' subplot; Cornelius and Voltemand, to 'Norway'; Reynaldo, to Laertes's 'France'; the Priest and Gravedigger, to the world of the dead. These centrifugal threads—'tendrils', as they are sometimes called—contribute to the uncanny feeling that Elsinore is just the tip of the tragic iceberg: geography as the hidden dimension of fate, like genealogy in Greek tragedy. Genealogy, vertical, rooted in myth; geography, horizontal, in something like the nascent European state system.

Horatio

I may be exaggerating here, projecting onto the periphery of this diagram Napoleon's words at Erfurt on politics as the fate of the moderns. But Horatio's space—ambassadors, messengers, sentinels, talk of foreign wars, and of course the transfer of sovereignty at the end—all this announces what will soon be called, not Court, but State. The Court,

the space of 100 per cent clustering, where one is always seeing and being seen, as in Elias's *Court Society*, is really two families: Ophelia, Laertes and Polonius; Claudius, Gertrude and Hamlet. Horatio's world is more abstract: he exchanges just a couple of sentences with Claudius and Gertrude, and none at all with Polonius, Ophelia and Laertes. Here, incidentally, you see the difference between my network and that of the other Shakespeare study: for the latter Horatio *is* linked to Polonius, Laertes and Ophelia, because they are on stage together, which seems to me to miss the point of his character: his being a 'weak tie', unlike those hyperconnected families-at-Court. Weak, that is to say: less intense, but with a wider radius; and more impersonal, almost bureaucratic, like the ties described by Graham Sack in his study of *Bleak House*.[9]

I may be making too much of this; or, Horatio may really be a fantastic half-intuition on Shakespeare's part; and I say 'half', because there is something enigmatically undeveloped about him. Think of Posa, in Schiller. *Don Carlos* is to a large extent a remake of *Hamlet*, and Posa is certainly a remake of Horatio: another lonely friend of another sad prince in another oedipal play. But Posa has a reason for being so central: he is that new figure, so important for modern drama: the ideologue. There is something he wants to *do*. Horatio? Kent is near Lear out of loyalty; Macduff, near Malcolm to avenge his family. Horatio?

Horatio has a function in the play, but not a motivation. No aim, no emotions—no *language*, really, worthy of *Hamlet*. I can think of no other character that is so central to a Shakespeare play, and so flat in its style. Flat, just like the style of the State (or at least, of its bureaucracy). Flat, like the typical utterances we encounter at the periphery of *Hamlet*: orders and news: 'And we here dispatch/ You, good Cornelius, and you, Voltemand' (1.2.33–4); 'Sea-faring men, sir. They say they have letters for you' (IV.6.2–3). Orders and news must avoid ambiguity, and so, around them, the play's 'figurality rate' (to use a concept of Francesco Orlando's) drops; language becomes simple. Conversely, as we move towards the centre of the network figurality rises, all the way to Hamlet's puns in response to Claudius, and to the soliloquies that occupy, so to speak, the centre of the centre. You see the possibility here: different uses of

[9] Alexander Graham Sack, '*Bleak House* and Weak Social Networks', unpublished thesis, Columbia University, 2006. The concept of 'weak tie' was first formulated by Mark Granovetter in 'The Strength of Weak Ties', *American Journal of Sociology*, vol. 78, no. 6, May 1973.

language emerging in different network regions. Style, integrated within plot as a *function* of plot. It would be a breakthrough, and not just for literary analysis—which has never been able to create a unified theory of plot and style—but for the analysis of culture more broadly. Because plot and style could provide a small-scale model to study two general properties of human societies: plot, to understand how the simple exchange between two individuals evolves into complex patterns made of thousands of interactions; and style, to study how human beings make sense of their actions. A model for the relationship between what we do, and how we think about it: this is what a plot–style continuum could provide. But we are definitely not there yet.

Symmetry

Networks are made of vertices and edges; plot networks, of characters and verbal exchanges. In plays this works well, because words are deeds, deeds are almost always words, and so, basically, a network of speech acts is a network of actions. In novels, no, because much of what characters do and say is not uttered, but narrated, and direct discourse covers only a part of the plot—at times, a very small part. This makes the transformation of plots into networks a lot less accurate, but the idea is too tempting to just let it go, and so I will show a few networks of verbal exchanges from *The Story of the Stone* and *Our Mutual Friend* just the same. A couple of years ago I conjectured that the number of characters could be a major source of morphological differences between Chinese and Western novels, and networks seem to be a good way to test the idea.

Unlike with *Hamlet*, however, I won't present networks for the entire text, but only chapter-networks; I could perhaps manage *Our Mutual Friend* (even though, by Western standards, it has a lot of characters), but certainly not the hundreds and hundreds of characters of *The Story of the Stone*, in which each chapter has between 5 and 28 different speaking characters, with a median of 14. *Our Mutual Friend* is less crowded: between 3 and 14 speaking characters per chapter, with a median of 6. And here is one of them: Chapter One of Book Two of the novel, Figure 16, which introduces Jenny Wren and Headstone; Chapter Two, a variation on this, Figure 17, with Lizzie's other suitor, Wrayburn, and Jenny's father; Chapter Four, with the revenge of the Lammles over Podsnap via his daughter, Figure 18. And so on.

FIGURE 16. *Our Mutual Friend, II.1*

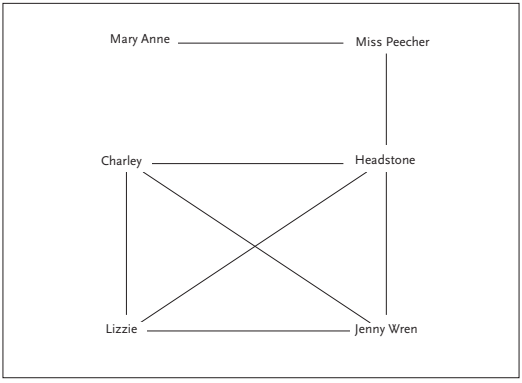


FIGURE 17. *Our Mutual Friend, II.2*

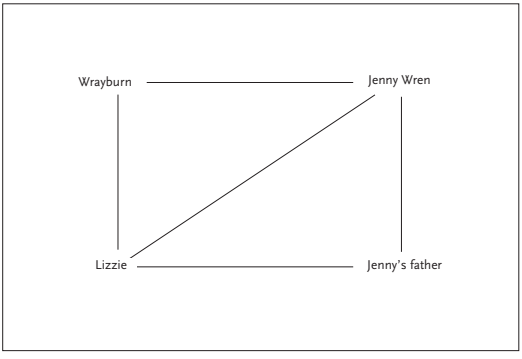
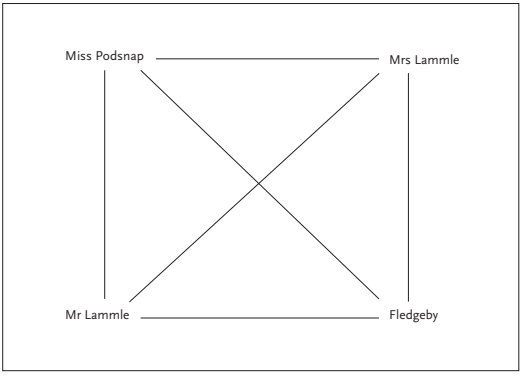


FIGURE 18. *Our Mutual Friend, II.4*



Now, in Western novelistic poetics, aside from a few neo-classical moments, symmetry has never been an important category. But you look at these networks (and others) from *Our Mutual Friend* and it is stunning how regular they are. Probably, there are two reasons for this. The first is that Dickens's building blocks are usually binary pairs: husband and wife, parent and child, brother and sister, suitor and beloved, friend and friend, employer and employee, rival and rival . . . And, second, these binaries can project their dualism onto the chapter as a whole because there is very little 'noise' around them—very few other characters to disrupt the symmetry. Or in other words: with few characters, symmetry seems to emerge by itself, even in the absence of an aesthetics of symmetry.

An aesthetics of symmetry is on the other hand very present in Chinese literary culture, where readers of novels expect, in Andrew Plaks's words, that 'the overall sequence of chapters' will add up to a 'round and symmetrical number, typically 100 or 120'. The pronounced sense of symmetry 'provides the ground for a variety of exercises in structural patterning. Most noticeable among these is the practice of contriving to divide an overall narrative sequence precisely at its arithmetic midpoint, yielding two great hemispheric structural movements.'[10]

Hemispheric movements . . . Think of the rhymed couplets that serve as chapter epigraphs in classical Chinese novels: 'Zhou Rui's wife delivers palace flowers and finds Jia Lian pursuing night sports by day / Jia Bao-yu visits the Ning-guo mansion and has an agreeable colloquy with Qin-shi's brother'. A does this and meets B; C does that and meets D. As if the two halves of the chapter mirrored each other perfectly: 'A very earnest young woman offers counsel by night / And a very endearing one is found to be a source of fragrance by day'. 'Parallel prose', as Chinese aesthetics calls it. So you take *The Story of the Stone*, use bold edges for the first half of the chapter, dotted edges for the second half, and . . . Figures 19–22.

Chinese novels should have *more* symmetry than European ones. But no. And the number of characters is probably again the reason: if with few characters symmetry emerges almost by itself, with *many* characters it becomes implausible. It is one of those cases where size is not just size: it is *form*. But what does this form mean? Dickens's symmetry is clear: it

[10] Andrew Plaks, 'The Novel in Premodern China', in Moretti, ed., *The Novel*, Princeton 2006, vol. I, p. 189. See also Plaks, 'Leaving the Garden', NLR 47.

FIGURE 19. *The Story of the Stone, chapter 3*

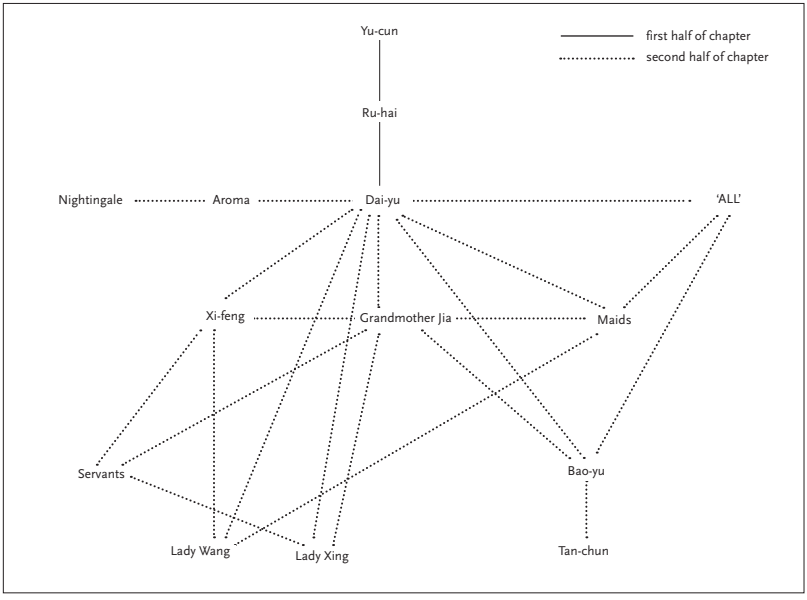


FIGURE 20. *The Story of the Stone, chapter 19*

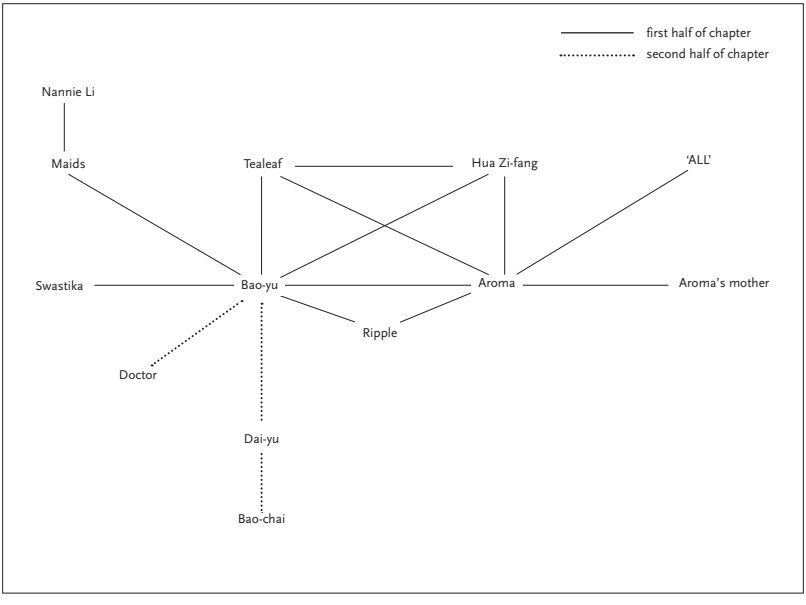


FIGURE 21. *The Story of the Stone, chapter 22*

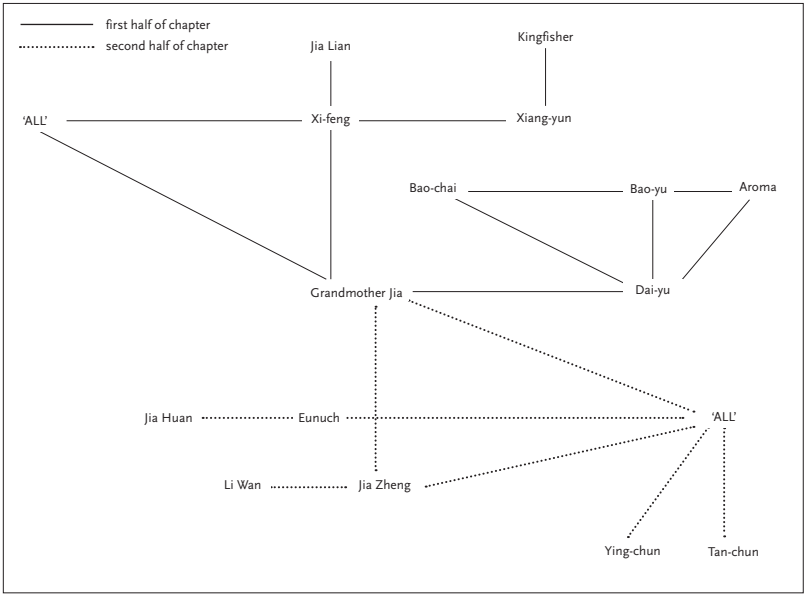


FIGURE 22. *The Story of the Stone, chapter 26*

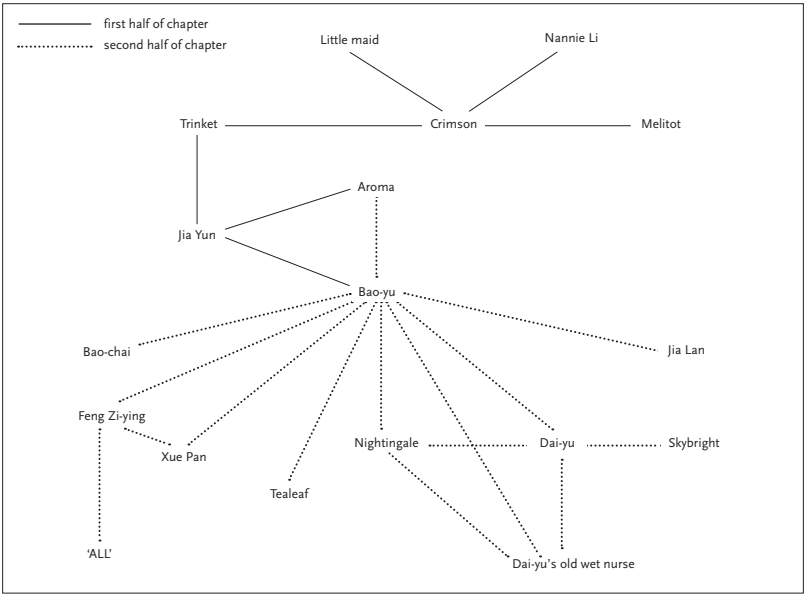
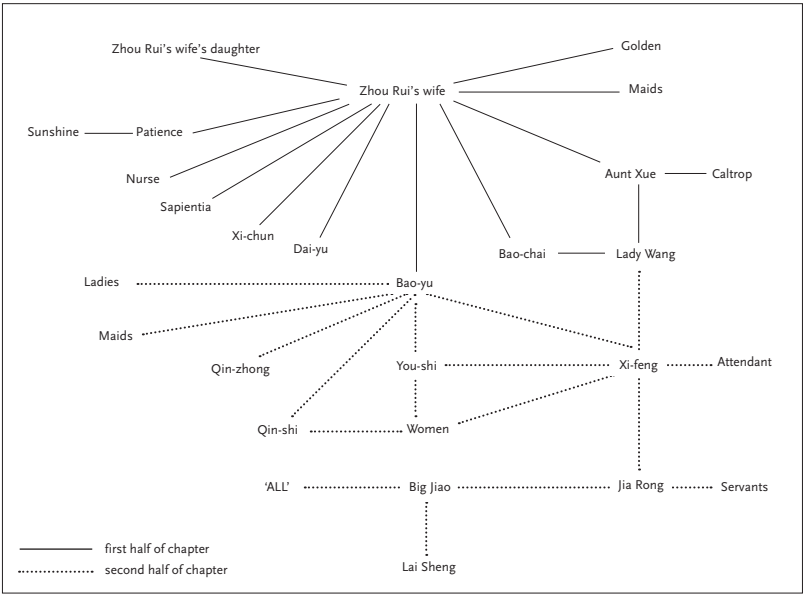


FIGURE 23. *The Story of the Stone, chapter 7*



indicates that, below the surface of social interactions, there is always a melodramatic substratum of love or hatred ready to erupt. A-symmetry?

Guanxi

First half of the seventh chapter of *The Story of the Stone,* Figure 23. Zhou Rui's wife, who is a member of the staff of the Rong mansion, must report to Lady Wang on the visit of a distant relative; she does not find her in her apartment, asks about her, is sent to other parts of the compound, is given some errands, inquires about some new faces and about people she hasn't seen in a while, is asked to intercede for her son-in-law . . . and so she ends up meeting a dozen characters—or more exactly, *speaking* to a dozen characters, she meets about twice as many, while another twenty or so are mentioned in the various conversations.

Nothing major happens here: people talk, walk around, play *go,* gossip . . . No interaction is crucial in itself. But taken together, they perform an essential reconnaissance function: they make sure that the nodes in this region are still communicating: because, with hundreds

of characters, the disaggregation of the network is always a possibility. We are close to one of the most distinctive keywords of Chinese culture: *guanxi*: something like 'connections', translate Gold, Guthrie and Wank; part of 'a specifically Chinese idiom of social networks . . . linked to other building blocks of sociality such as *ganqing* (sentiment), *renqing* (human feelings), *mianzi* (face) and *bao* (reciprocity)': a world which is 'neither individual- nor society-based, but *relation*-based'.[11] And these relations are not a given, they are an artefact; 'manufacturing obligation', 'chain of transactions', 'indebtedness', 'consciously producing' connections—this is the lexicon of *guanxi*.[12]

A chain of transactions that generate indebtedness: in chapter 24 of the novel (Figure 24), Jia Yun, who is a poor relative of the Rong-guo house, is looking for work; he asks Jia Lian but receives only vague promises, so he turns to his uncle Bu Shi-ren, who owns a store, hoping to get some perfumes on credit to use as presents. Bu Shi-ren says no, Jia Yun walks away and bumps into a drunk, who turns out to be his neighbour Ni Er, a racketeer; Ni Er finally lends him the money, and Jia Yun buys a present for Xi-feng, who is in charge of the finances of the clan. This is how *guanxi* works—and this is what creates the asymmetry: a character rallies all its resources in order to 'manufacture obligation', unbalancing a whole cluster of interactions in the same direction. Ideally, in the long run *guanxi* will produce reciprocity, and hence symmetry: but at the scale *of the chapter*, asymmetry is exactly what we should expect. And, needless to say, a story which is unbalanced at the local scale, and balanced at a higher one—this is interesting. Even more so, if in Dickens we were to find the opposite configuration: symmetry in the chapters—and asymmetry in the plot as a whole. We'll see.

Fruitful doing

In the last two Figures, I have focused on how individual behaviour contributes to the shape of the network; now I'll turn the matter around, to see how the overall network of *The Story of the Stone* shapes individual

[11] Thomas Gold, Doug Guthrie and David Wank, 'An Introduction to the Study of *Guanxi*', in Gold, Guthrie and Wank, eds, *Social Connections in China: Institutions, Culture, and the Changing Nature of Guanxi*, Cambridge 2002, pp. 3, 4, 10.

[12] See Gold, Guthrie and Wank, 'Introduction', p. 6, Mayfair Mei-hui Yang, *Gifts, Favours and Banquets: The art of social relationships in China*, Ithaca, NY 1994, pp. 6, 44 and 125, and Andrew Kipnis, 'Practices of *guanxi* production and practices of *ganqing* avoidance', in Gold, Guthrie and Wank, *Social Connections in China*.

FIGURE 24. *The Story of the Stone, chapter 24*

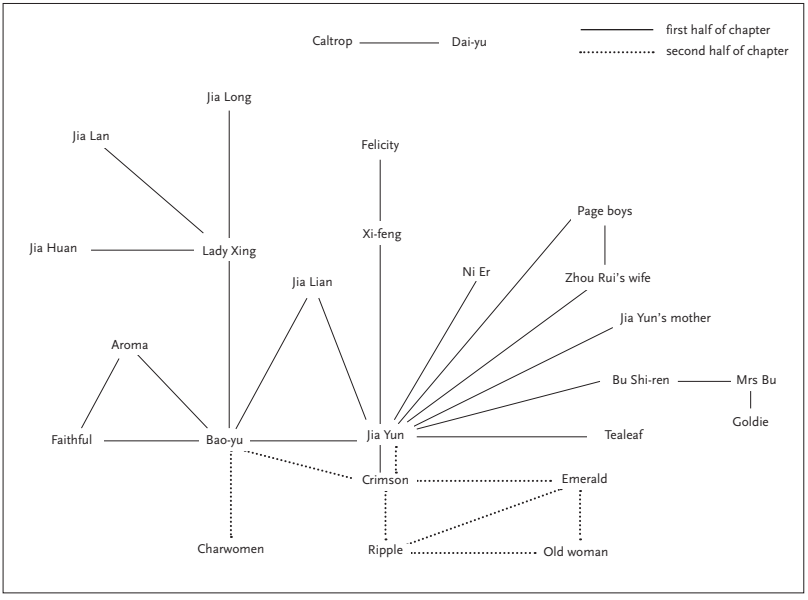
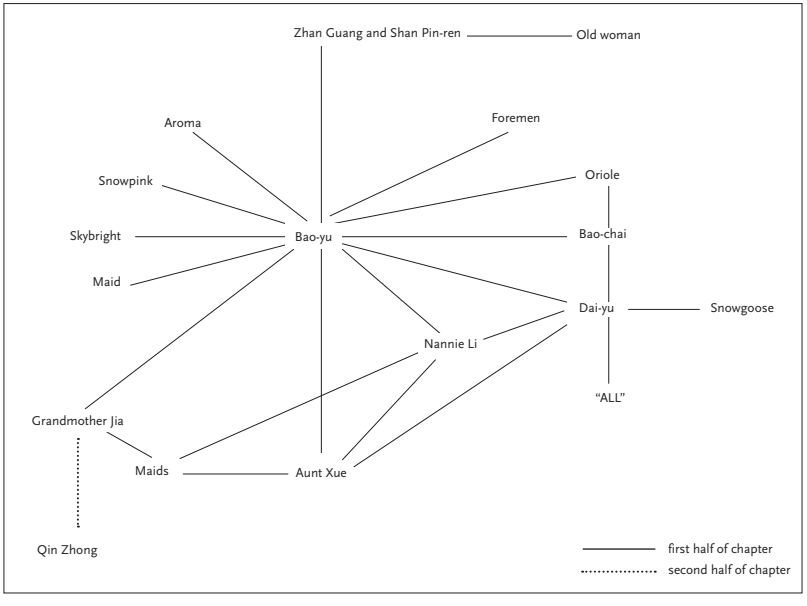


FIGURE 25. *The Story of the Stone, chapter 8*



characters in a specific way. Bao-yu, in chapter 8, is a good instance of this, Figure 25: as the chapter unfolds, he takes part in three distinct episodes: he has an important encounter with his pre-destined bride Bao-chai, which is catalysed by her maid Oriole; then he gets drunk amidst the banter of the characters around him, despite Nannie Li's vigilance; finally, he throws a tantrum with his maids, until Aroma threatens a general desertion. Three episodes; all mediated by different characters; each of them bringing out a distinct side of Bao-yu (naive lover, sensuous youth, petty domestic tyrant) due to his interaction with a different cluster of characters. And the same happens in every chapter of the novel: its huge pack of characters is re-shuffled, the new 'hand' forms new character-clusters, which generate new features in the figures we already knew. Novelty, as the result of recombination: in the first twenty chapters of the novel, Bao-yu speaks to 54 characters, and not once does the same group reform around him.

Now, Bao-yu is arguably the protagonist of *The Story of the Stone*: the male child born under very special auspices, and expected to do great things for his family. But what a strange life, for a protagonist: constantly summoned by this and that relative, kept under supervision, asked to perform all sorts of duties—even the many delightful opportunities he is offered come usually with constraints attached. The protagonist, yes, but not free. The protagonist, *and therefore* not free: because he has a duty *towards the structure*: towards the relation-based society he is part of. 'The One *for* the Many': Elizabeth Bennet, not off to Pemberley on her own, but kept at home, to shape the life of her sisters.

A different role for the protagonist, resulting from a different set of narrative relations: what networks make visible are the opposite foundations of novel-writing East and West. One day, after we add to these skeletons the layers of direction, weight and semantics, those richer images will perhaps make us see different genres—tragedies and comedies; picaresque, gothic, *Bildungsroman* . . .—as different shapes; ideally, they may even make visible the micro-patterns out of which these larger network shapes emerge. But for this to happen, an enormous amount of empirical data must be first put together. Will we, as a discipline, be capable of sharing raw materials, evidence—*facts*—with each other? It remains to be seen. For science, Stephen Jay Gould once wrote, fruitful doing matters more than clever thinking. For us, not yet.