

## 5 CO-WITNESSING NETWORKS: ROYAL CHARTERS

### PART ONE: NETWORK OF ALL ROYAL DOCUMENTS

The Social Network Analysis of all royal documents includes 935 documents, 1039 witnesses, and 16059 edges. Analysis of royal documents reveals strong similarities to the study of all witnesses, demonstrating that royal charters and other documents form the backbone of the social network study of co-witnessing. This study is based on the five specified document types in sources with an H-number beginning with 1. These are overwhelmingly charters (97%), as Table 5.1 shows. There are no agreements, as these are all H4 documents. As is obvious from Table 5.1 and illustrated vividly in Figure 5.1, the lion's share of the documents belong to the reigns of William I (43%) and Alexander II (29%). Of course, these reigns were also relatively long, 49 years and 35 years, respectively. While there are only 88 documents included from Malcolm IV, his reign was only just shy of 12 years. When we divide the numbers of documents by the lengths of the reigns, we see that the figures for the reigns of Malcolm, William, and Alexander II are roughly comparable (7.33, 8.27, and 7.83, respectively) (see Table 5.2). By contrast, the reigns of David I and Alexander III produced fewer than 3 documents per year. (While the reign of David was 29 years, however, most of the documents were produced in the last ten to fifteen, so a more sophisticated analysis would reveal higher numbers in the 1140s and 1150s.) This distribution of average number of royal documents per reign is given in Figure 5.2. The dataset also includes 3 early Scottish charters of Kings Edgar (1097-1107) and Alexander I (1107-24), one charter of Queen Ermengarde de Beaumont, wife of King William, as well as 10 charters of kings of the Isle of Man, and four charters of English kings dealing with Scottish properties.

Table 5.1 Document types, H1/ documents, five specified types

King	H-no	Charter	Charter/ brieve	Notification	Settlement	Total
Edgar	1/2	1	0	0	0	1
Alexander I	1/3	2	0	0	0	2
David I	1/4	82	0	3	0	83
Malcolm IV	1/5	88	0	0	0	88
William I	1/6	390	8	4	3	405
Alexander II	1/7	269	3	2	0	274
Alexander III	1/8	66	0	1	0	67
Queen Ermengarde	1/10	1	0	0	0	1
Kings of Man		9	0	0	0	10
English kings		4	0	0	0	4
Total		911	11	10	3	935

Figure 5.1 Royal documents by monarch

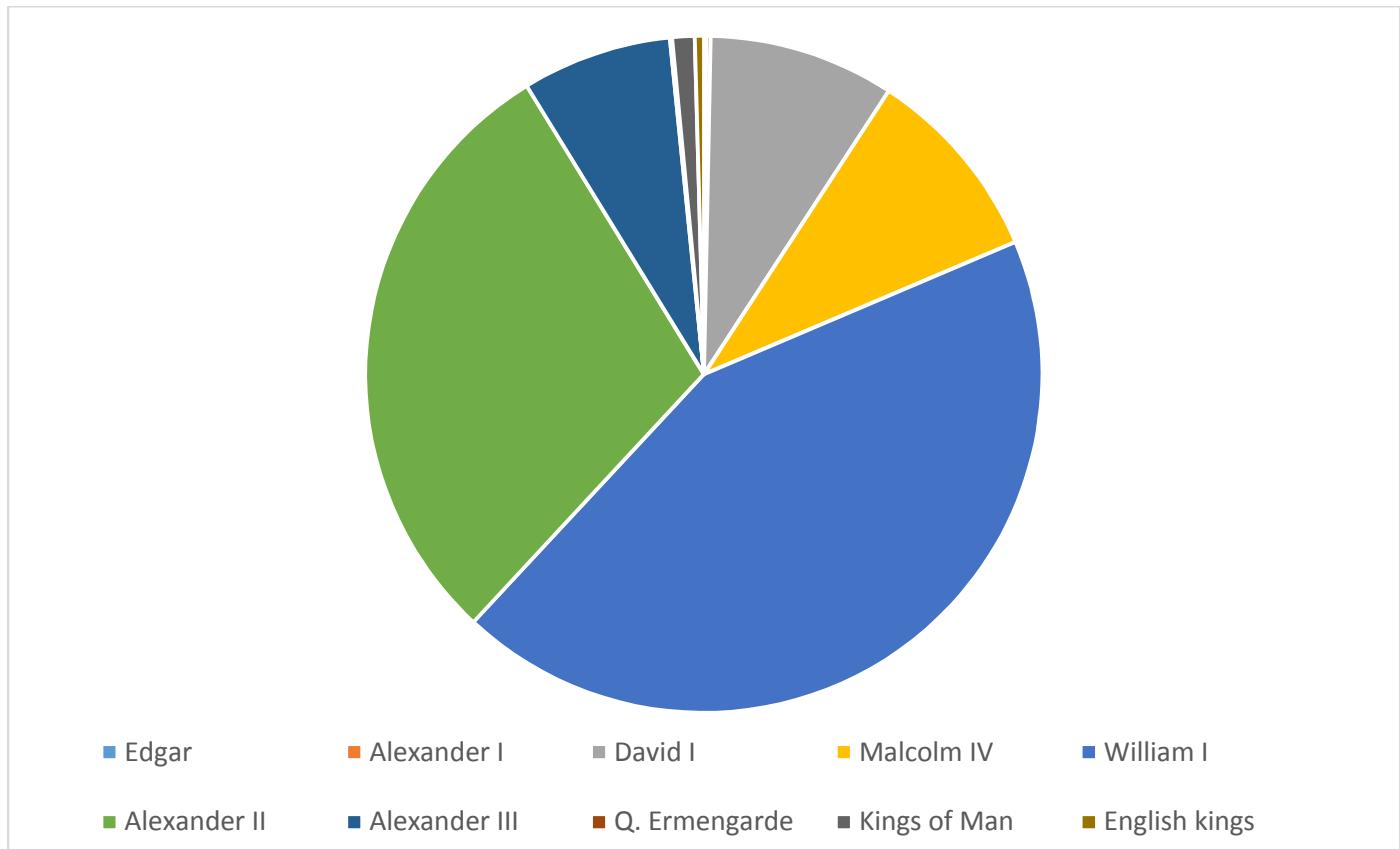
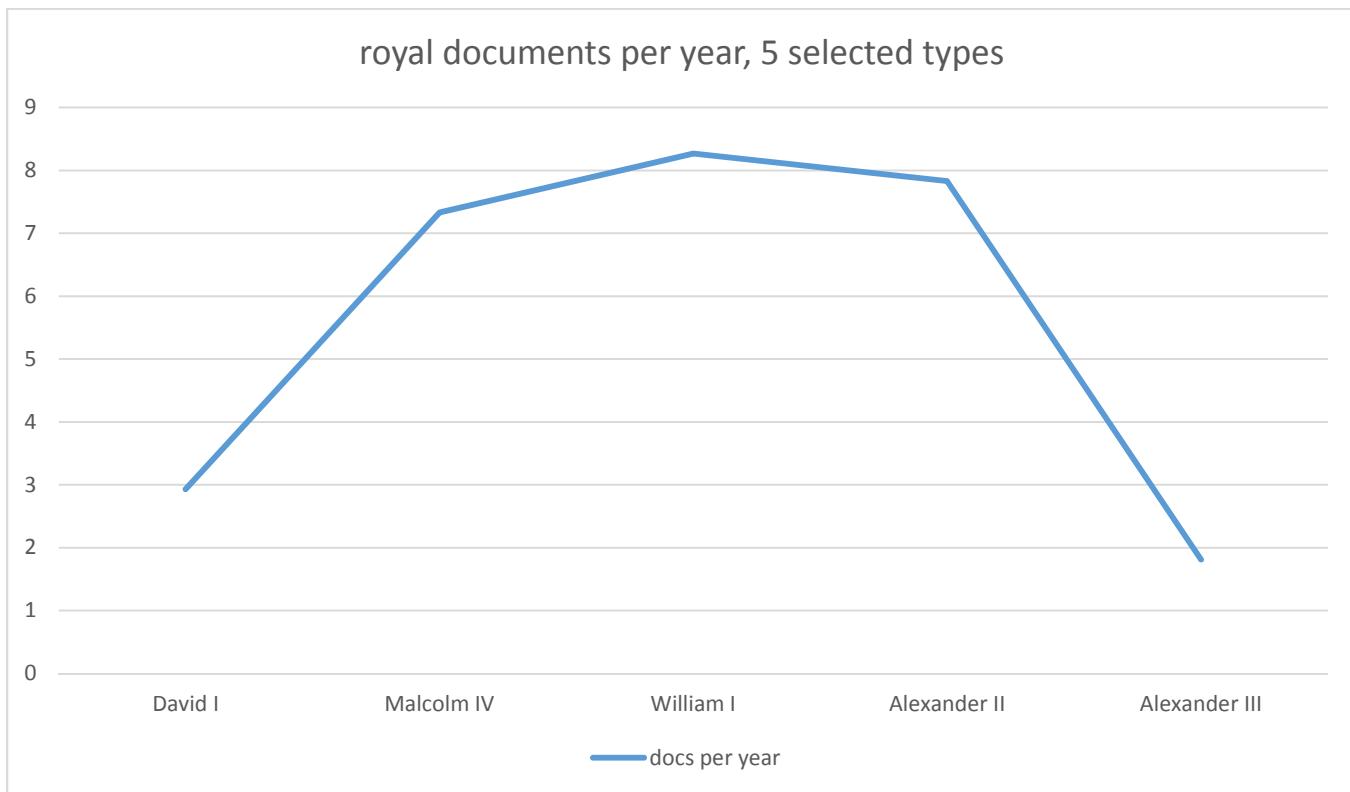


Table 5.2. Numbers of documents adjusted by length of reign

King	# documents	Length of reign	Adjusted number
David I	83	29	2.86
Malcolm IV	88	12	7.33
William I	405	49	8.27
Alexander II	274	35	7.83
Alexander III	67	37	1.81
Other	16	n/a	n/a

Figure 5.2. Comparison of reigns by average number of documents per year



There are 1039 witnesses, only two of whom were women. These were Ada de Warenne (d. 1178), mother of Kings Malcolm and William, and Ela, countess of Fife, wife of Earl Duncan (II) (d. 1204). As in the analysis of all witnesses, the most prominent players are those from the reign of William I.

There are similarities with the structure of the sociogram of All Witnesses, with the notable exceptions of the Coldingham segment and the ecclesiastical sub-groupings (such as those people around Bishop William Malveisin of St Andrews). A comparison of the top ten people by betweenness centrality from the analysis of royal charters with that for all witnesses is telling. William del Bois, whose centrality was

paramount among all witnesses, is not even in the top ten of witnesses to only royal documents. People who appear in both lists have been highlighted. Those who have moved up (from all witnesses to just royal) are in blue, those who have moved down are in yellow. Remarkably, only three people appear in both lists, and three of the top five are people who were active in the reign of Alexander II. The men with the four highest betweenness centralities in the H1 sociogram, filtered to witnesses of 15 documents, are shown in Figure 5.3.

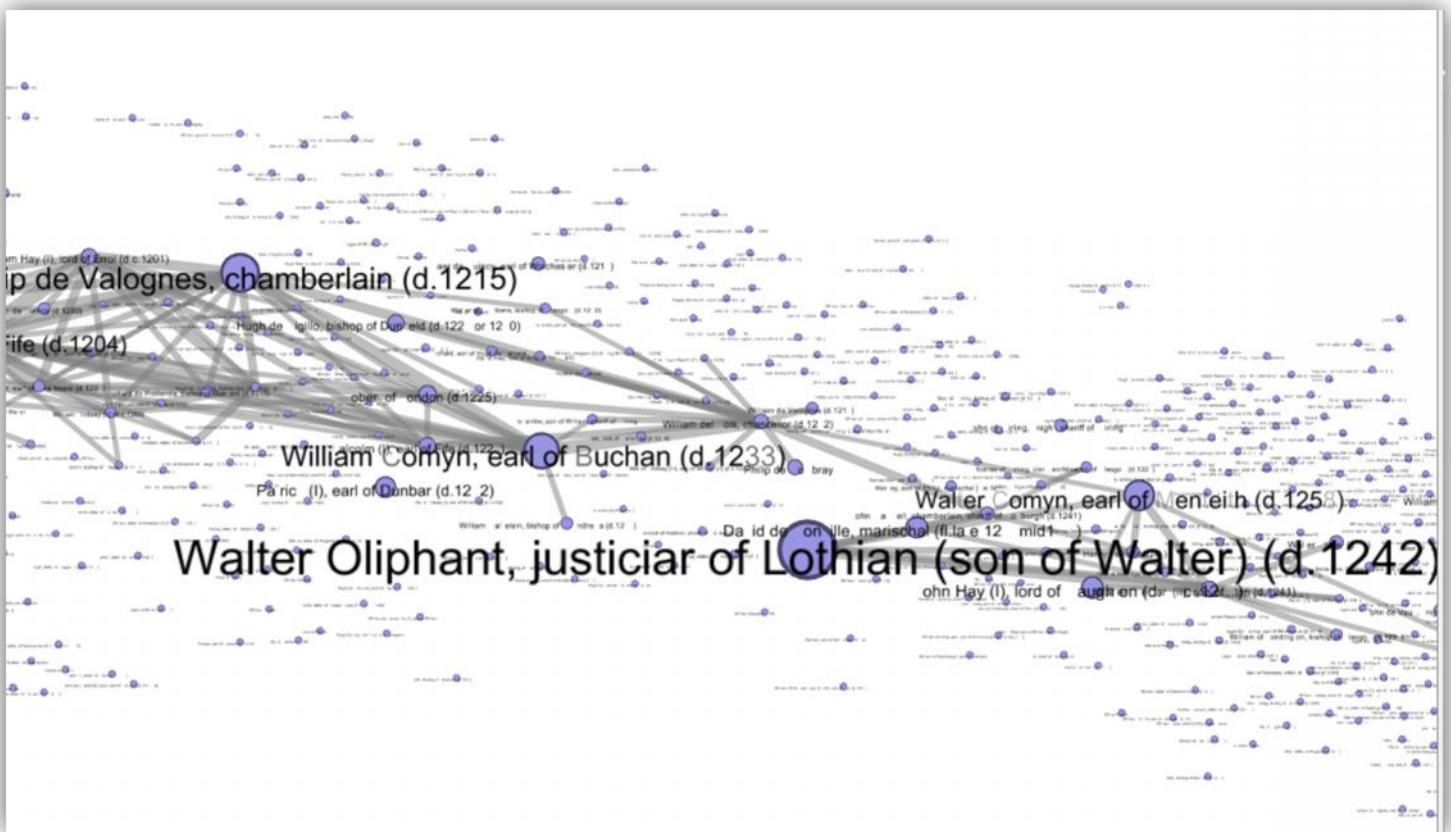
Table 5.3. Top ten by betweenness centrality (H1)

ID	Person Name	Betweeness centrality
1285	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	55682.88
15	Philip de Valognes, chamberlain (d.1215)	34104.62
16	William Comyn, earl of Buchan (d.1233)	31072.88
1357	Walter Comyn, earl of Menteith (d.1258)	25500.06
13	Duncan (II), earl of Fife (d.1204)	23947.63
140	Herbert, bishop of Glasgow (d.1164)	22741.82
3	Walter Stewart (I), son of Alan (d.1177)	19302.72
2	Matthew, bishop of Aberdeen (d.1199)	19260.61
1389	John Hay (I), lord of Naughton (d.xOct.1266)	16102.31
1135	David de Bonville, marischal (fl. late 12C-mid13C)	15855.48

Table 5.4: Betweenness Centrality – top ten, whole graph

ID	Person Name	Betweenness
42	William del Bois, chancellor (d.1232)	1317065
13	Duncan (II), earl of Fife (d.1204)	1096891
40	Alan Stewart, son of Walter (d.1204)	904283
444	Patrick (I), earl of Dunbar (d.1232)	806374
1285	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	795570
782	Malcolm (I), earl of Fife (d.1229)	724271
858	Walter of St Albans, bishop of Glasgow (d.1232)	723717
1378	Walter Stewart (II), son of Alan (d.1241)	698593
788	Andrew Murray, bishop of Moray (d. 1242)	691160
1389	John Hay (I), lord of Naughton (TRA2)	650865

Figure 5.3. Gephi sociogram of 15 connections, with top betweenness individuals showing



The following series of sociograms from the study of royal documents show the Netdraw and Gephi graphs at increasing thresholds for co-witnessing, and can be compared to the equivalent images for the study of all witnesses in the previous chapter. Figure 5.4 is the equivalent of the 'fish' image for all witnesses, a pattern which is clearer in Figure 5.5, which shows the network at more than five co-witnessing acts. The Netdraw sociograms allow a clearer view of the structure of the graph, while the Gephi sociograms, through retaining the unconnected nodes in the background, give a better sense of where the more central players are positioned in the broader context of the whole group. It should also be noted that the Gephi sociograms have the chronologically earlier individuals on the left side of the graph, while the Netdraw sociograms have them on the right (as we have seen with most graphs so far). Thus it is necessary to flip the network structure when comparing the two.

Figure 5.4. Netdraw: witnesses to H1 documents, whole graph

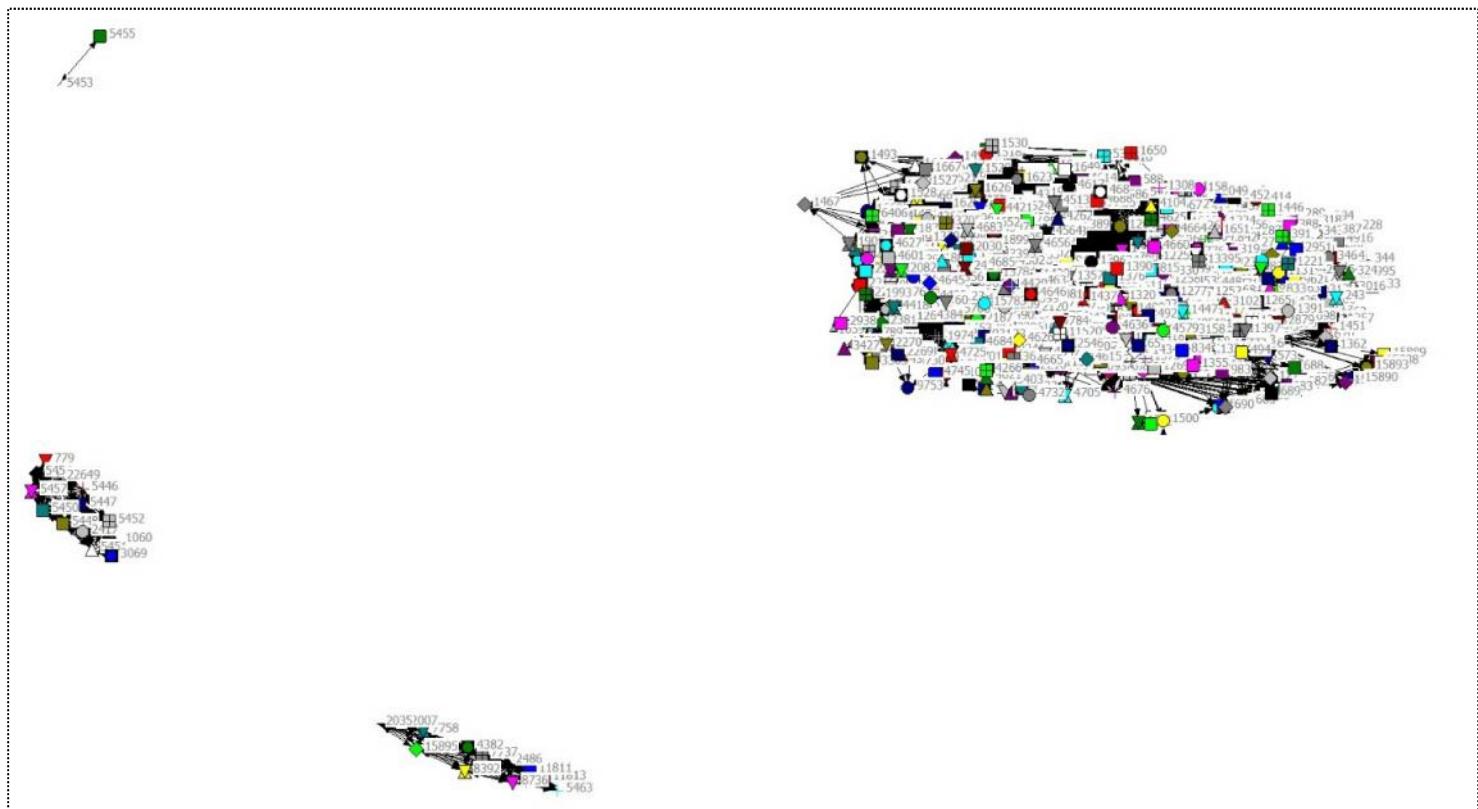


Figure 5.5. Netdraw: witnesses to H1 documents, >5 co-witnessing instances

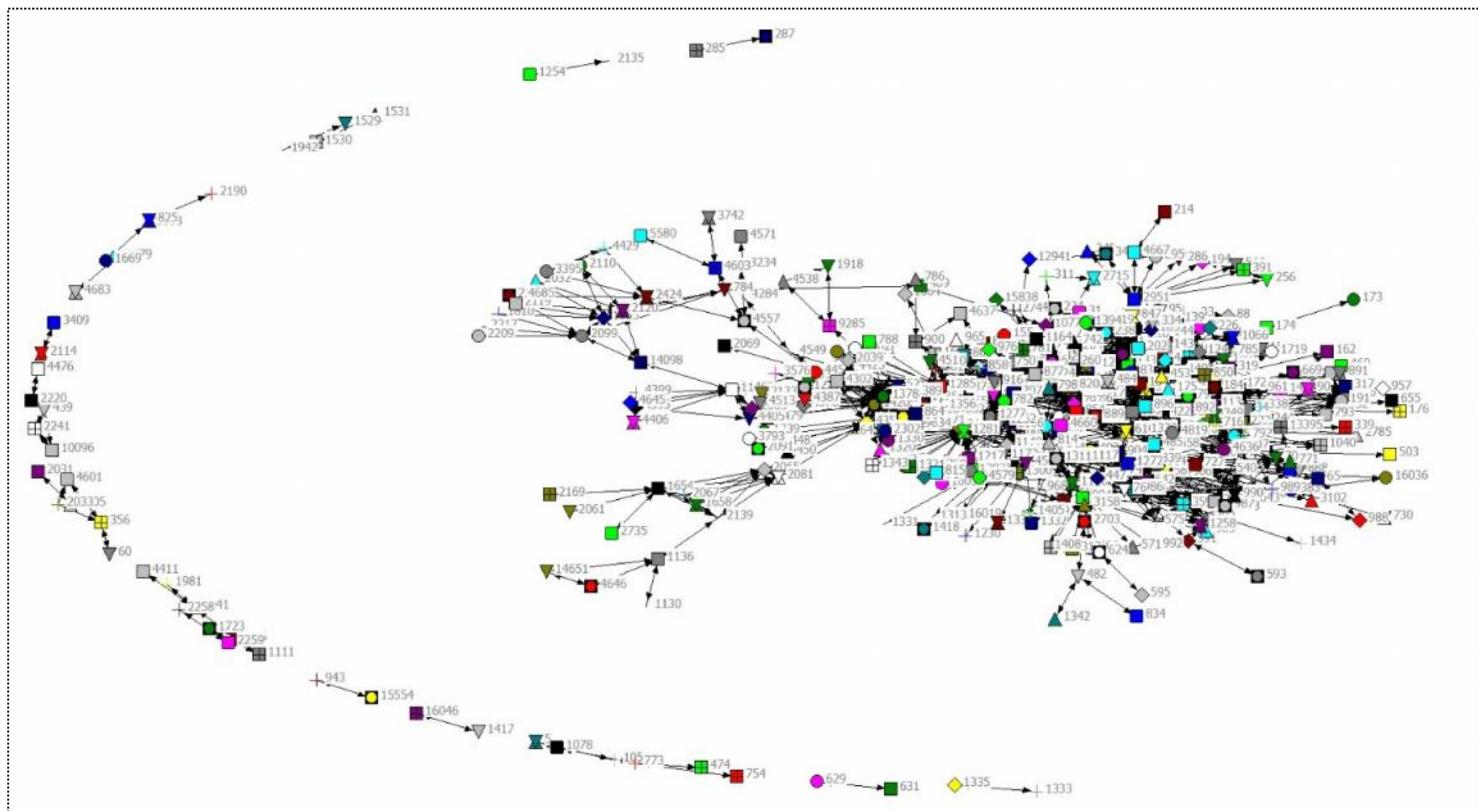


Figure 5.6. Gephi: witnesses to H1 documents, >5 co-witnessing instances

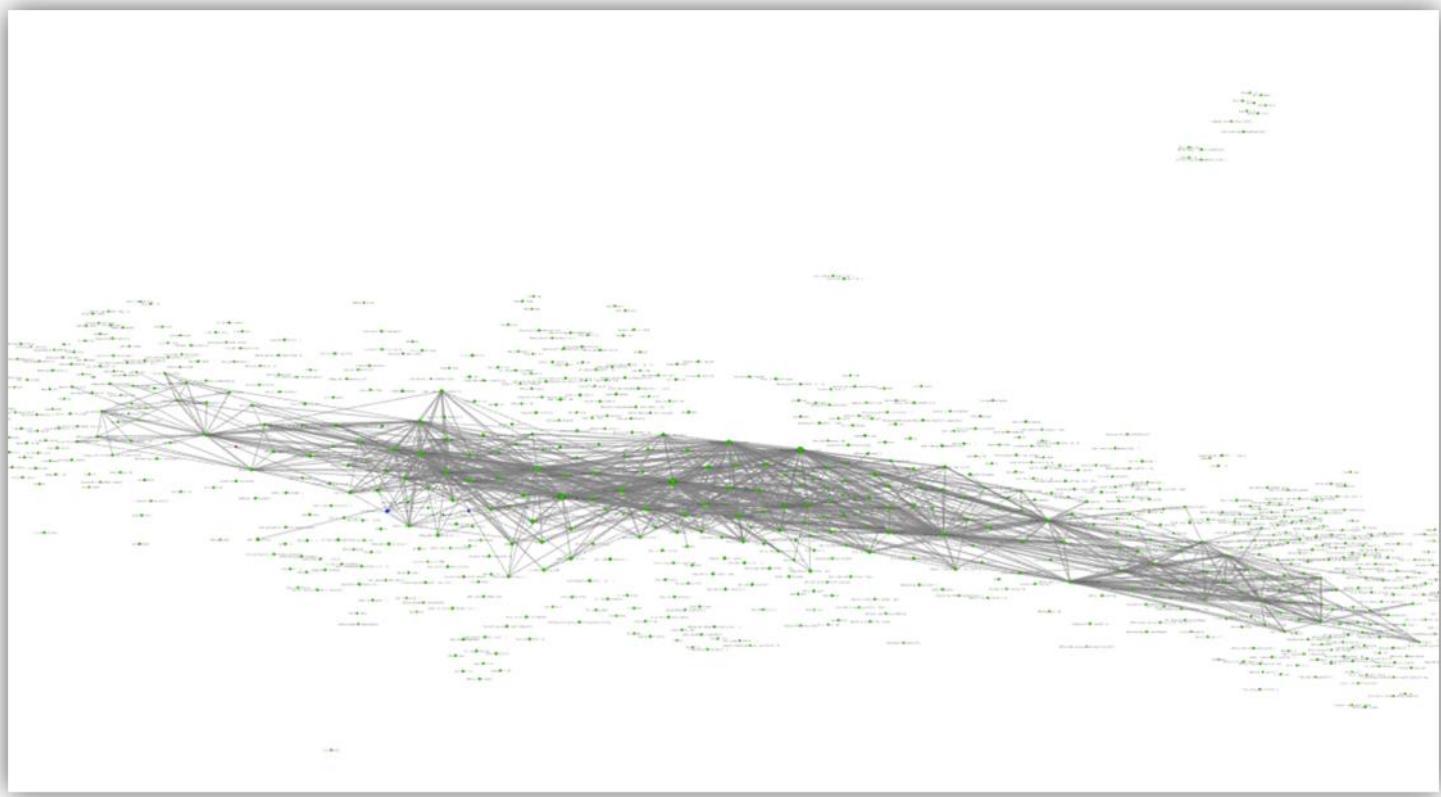


Figure 5.7. Netdraw: witnesses to H1 documents, >10 co-witnessing instances

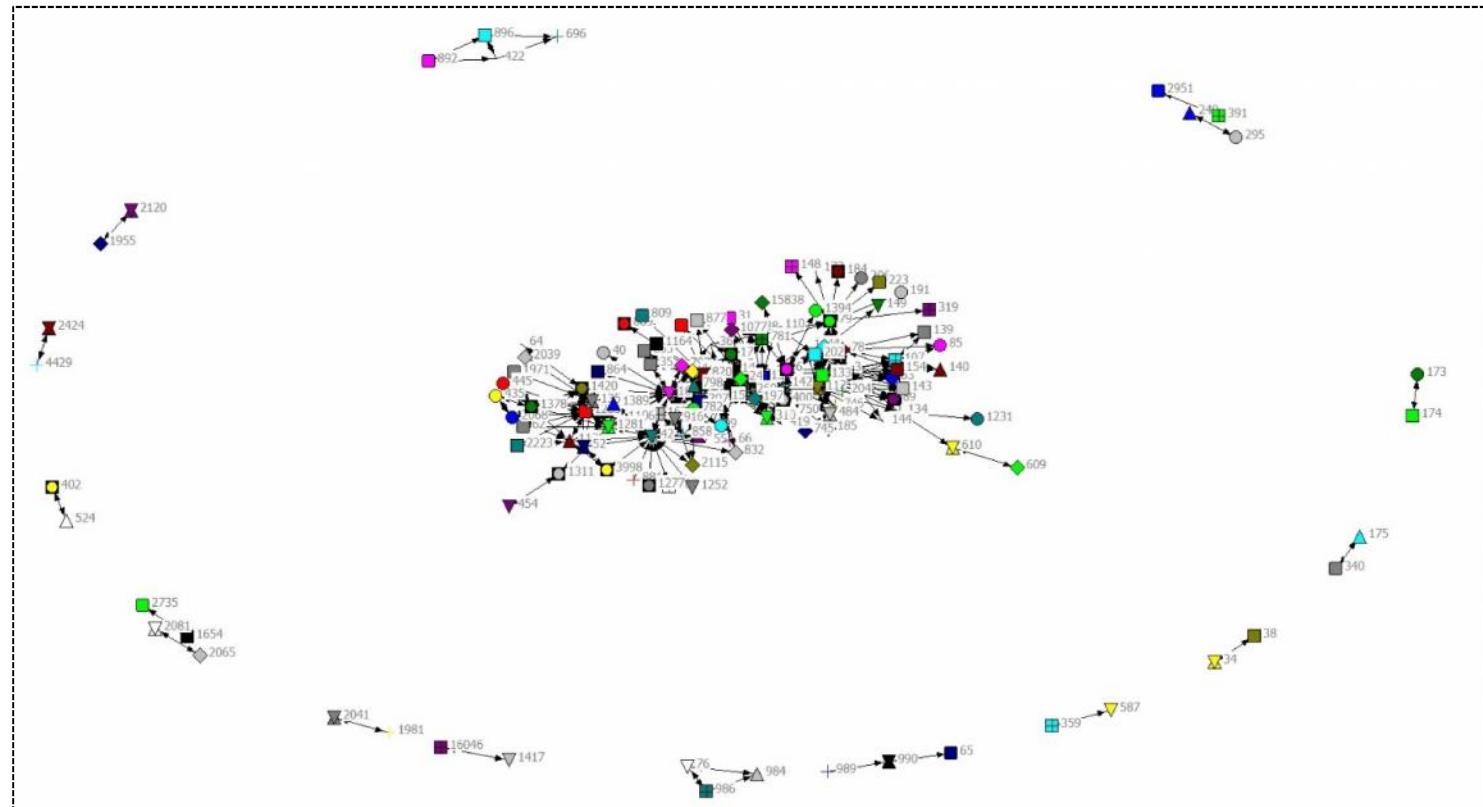


Figure 5.8. Gephi: witnesses to H1 documents, >10 co-witnessing instances

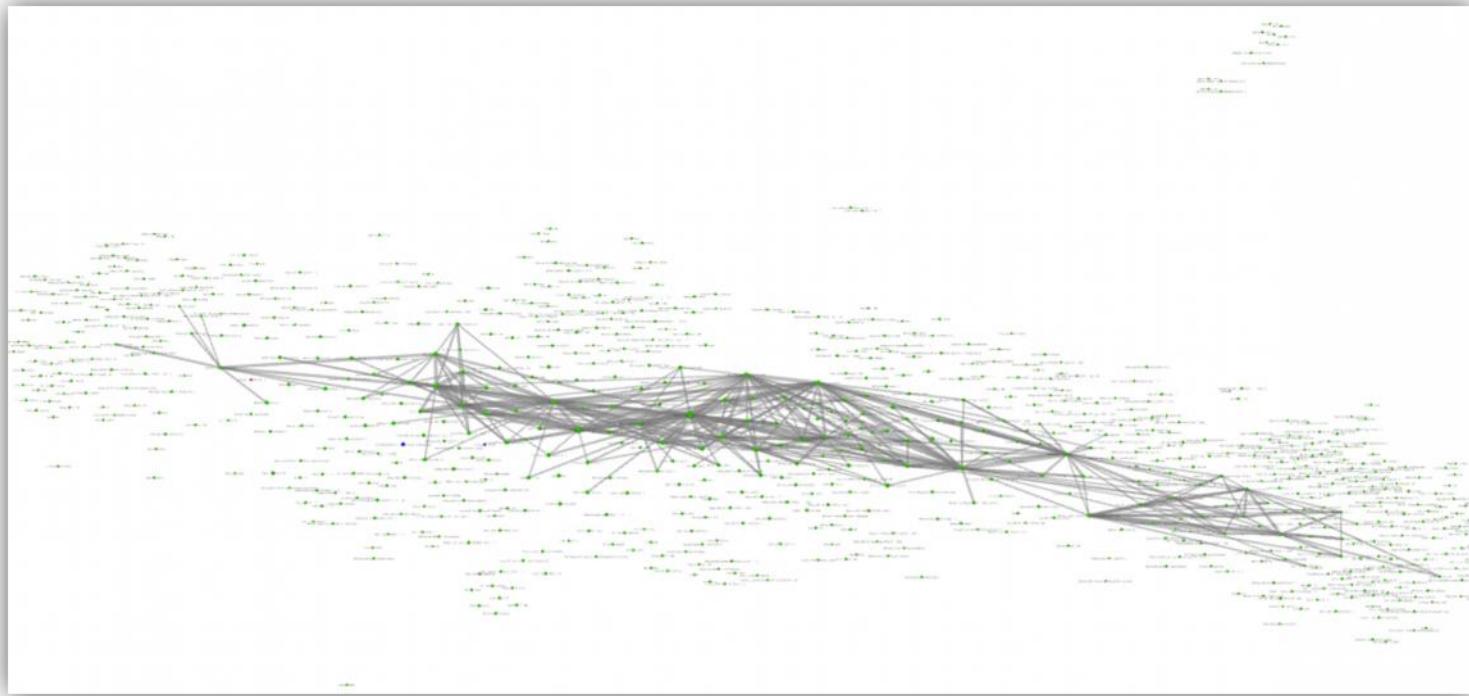


Figure 5.9. Netdraw: witnesses to H1 documents, >15 co-witnessing instances

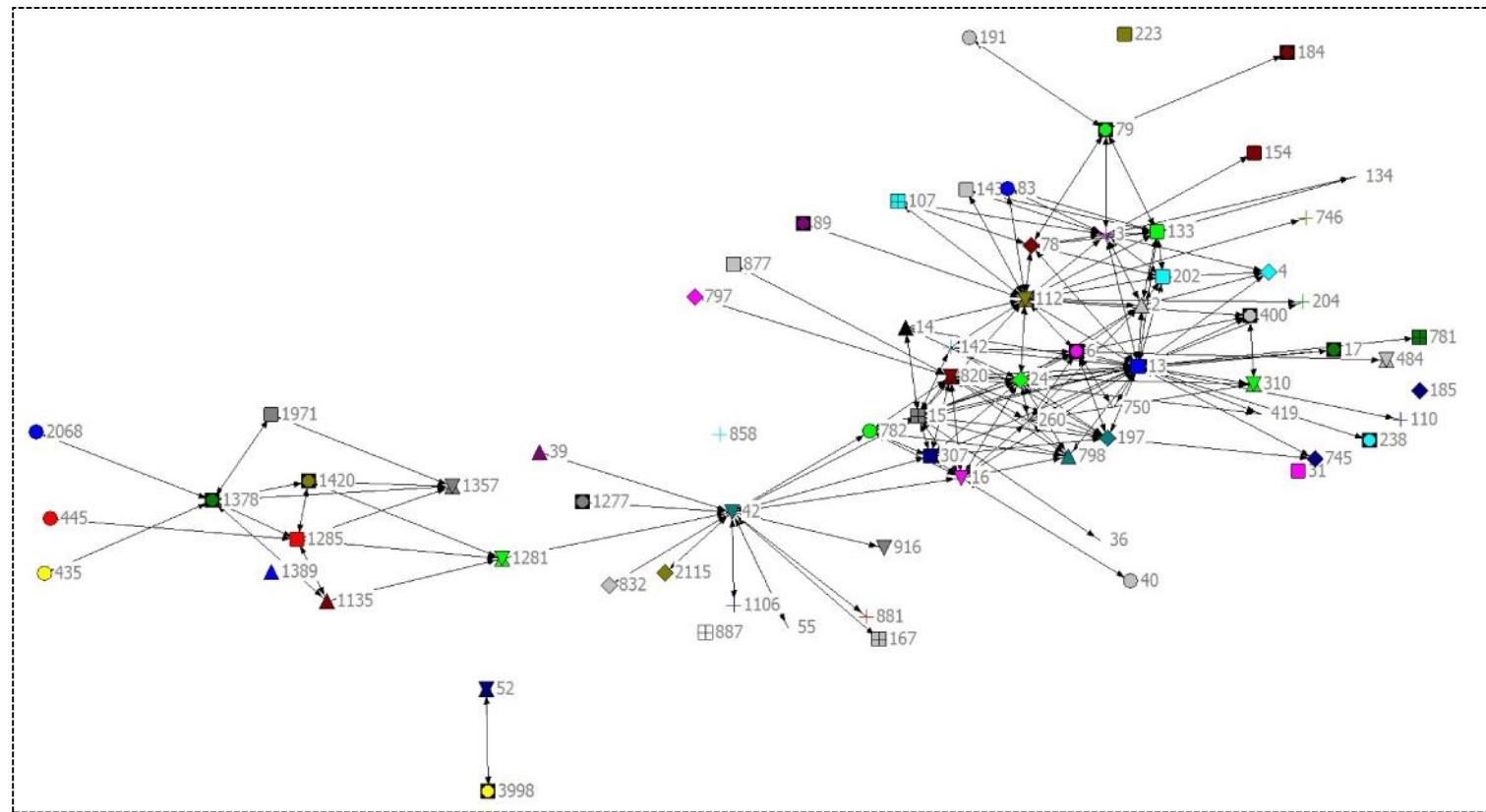


Figure 5.10. Gephi: witnesses to H1 documents, >15 co-witnessing instances

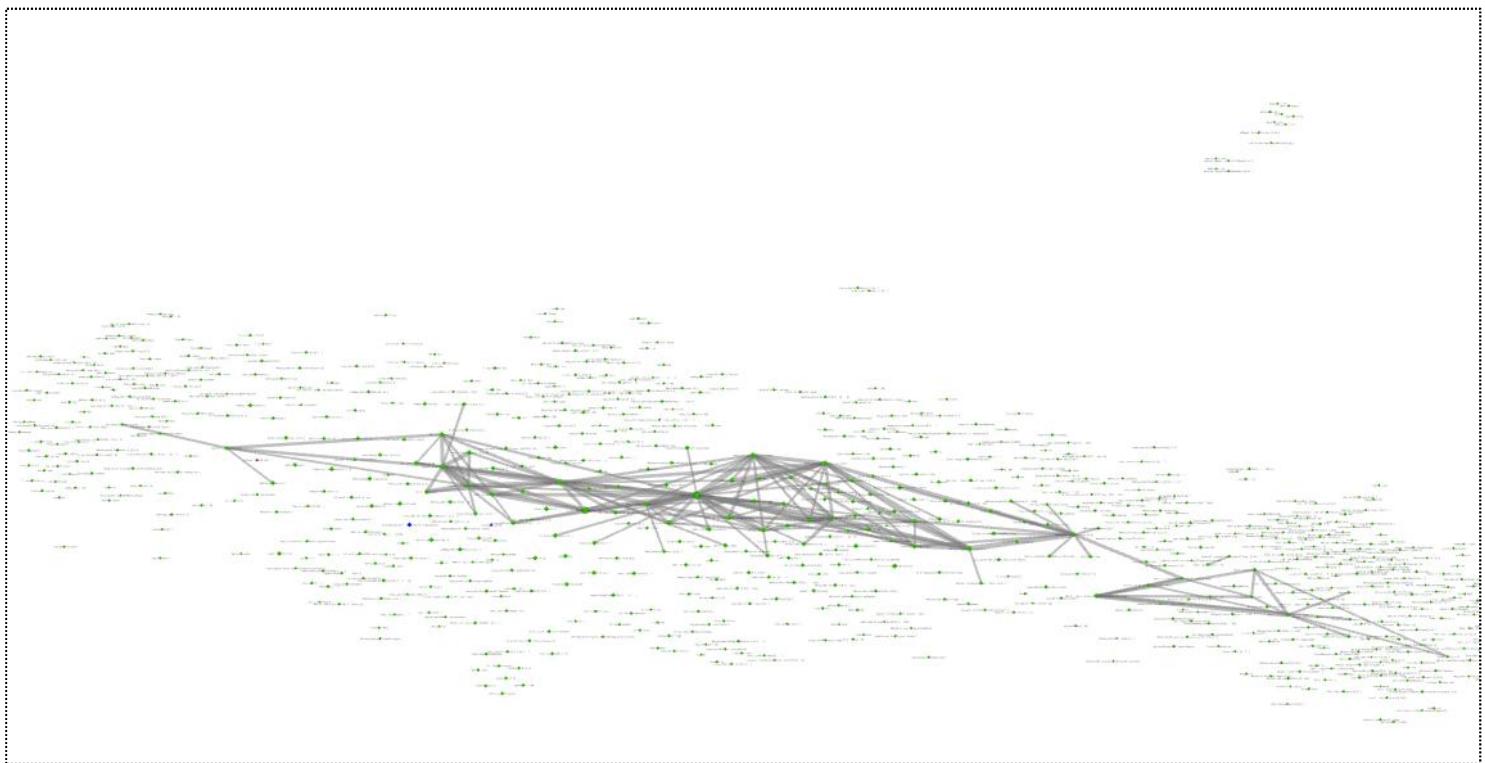


Figure 5.11. Netdraw: witnesses to H1 documents, >20 co-witnessing instances

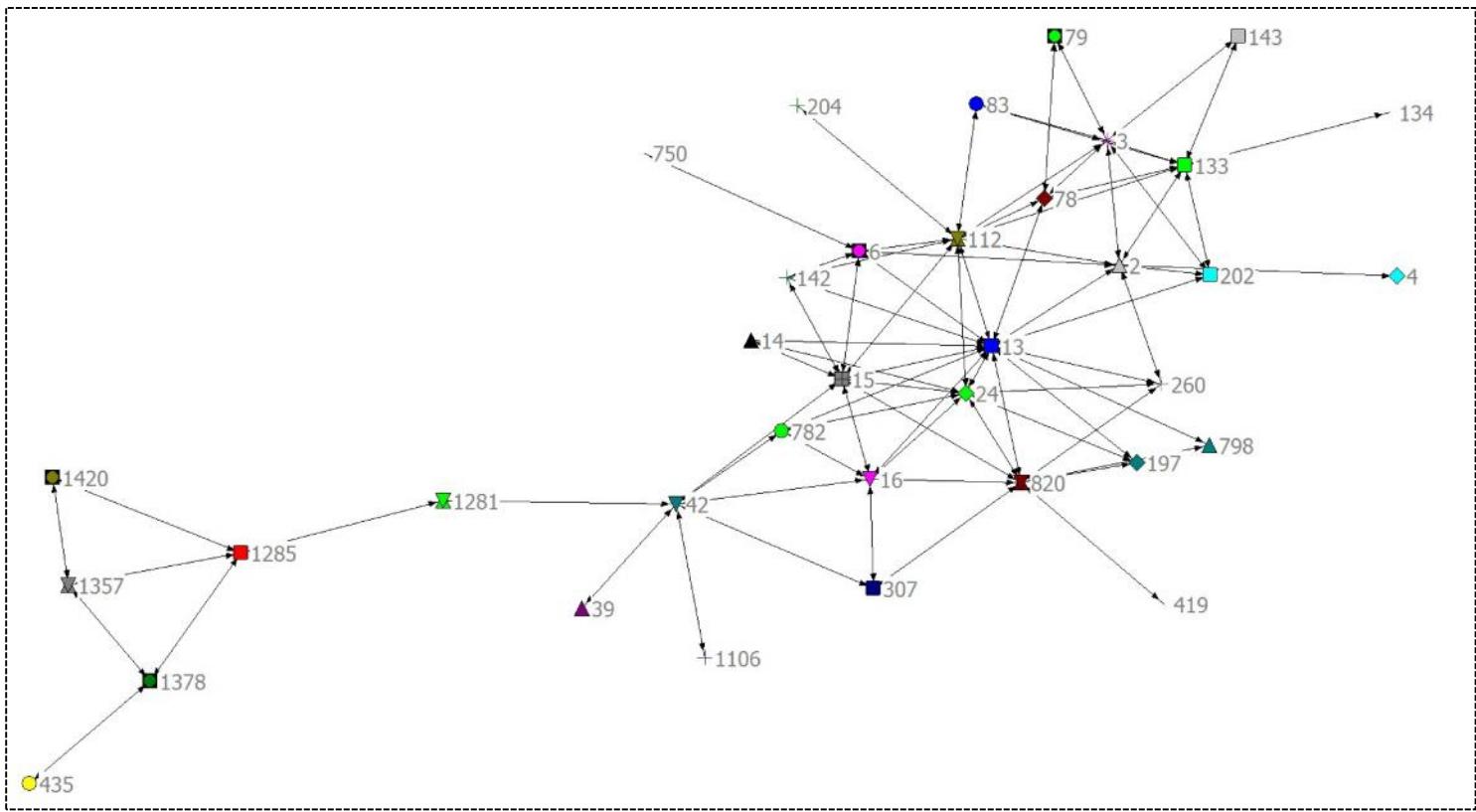


Figure 5.12. Gephi: witnesses to H1 documents, >20 co-witnessing instances

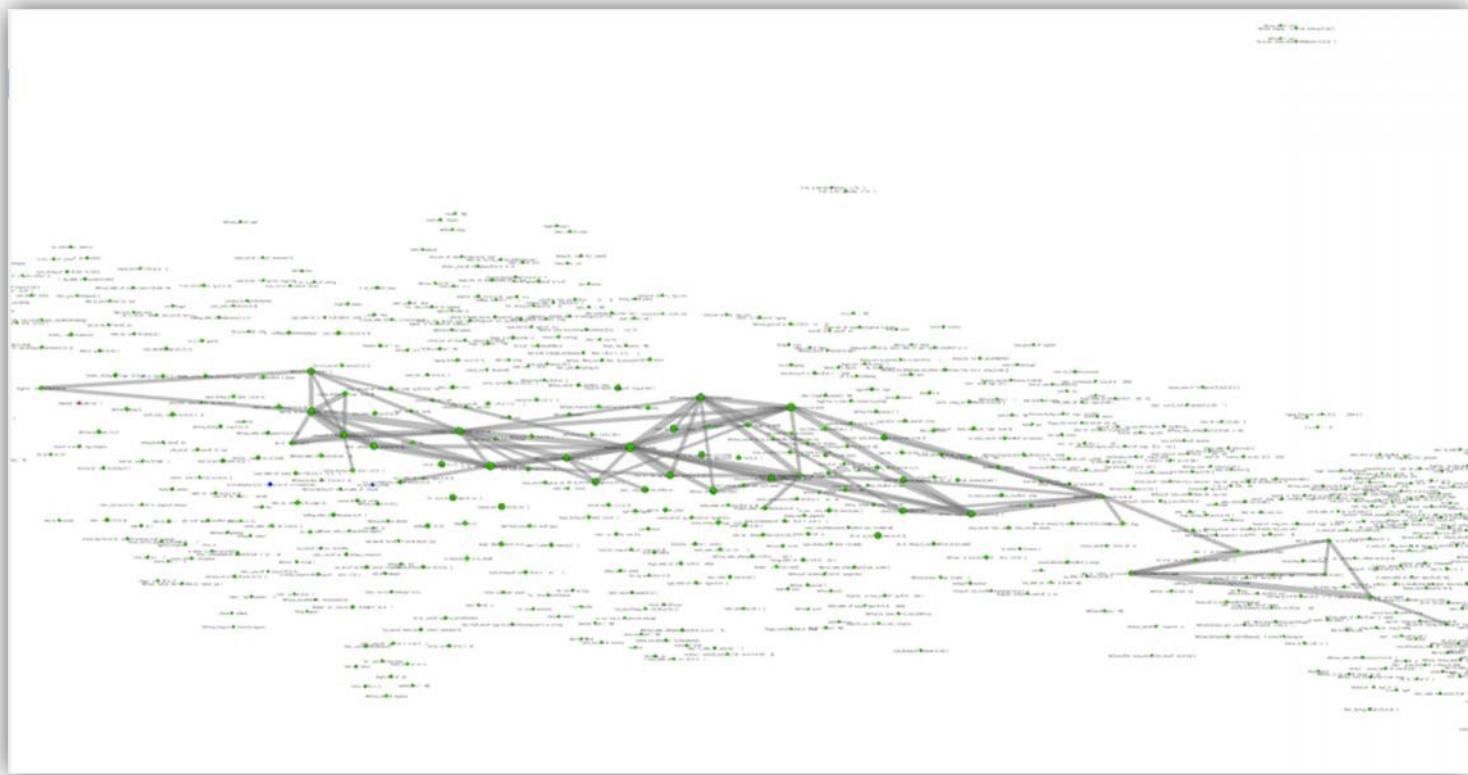


Table 5.5. Individuals who co-witness more than 20 times (by degree)

ID	Person Name	degree	eigenvector	betweeness
13	Duncan (II), earl of Fife (d.1204)	15	1	157.5
112	Richard de Moreville (d.1189 or 1190)	11	0.769958586	143.6786
15	Philip de Valognes, chamberlain (d.1215)	9	0.717693232	162.5476
24	William Hay (I), lord of Errol (d.c.1201)	9	0.700974386	25.74048
820	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	9	0.585041801	60.74762
2	Matthew, bishop of Aberdeen (d.1199)	8	0.555696545	55.34286
3	Walter Stewart (I), son of Alan (d.1177)	8	0.42415233	29.83333
133	Nicholas of Roxburgh, chancellor (d.1171?)	8	0.417104603	52.53333
16	William Comyn, earl of Buchan (d.1233)	7	0.540291969	41.19524
42	William del Bois, chancellor (d.1232)	7	0.281838425	231.5405
6	Walter Barclay, chamberlain (d.c.1193)	6	0.493961669	38.93333
78	Walter de Bidun (d.1178)	5	0.388724169	28.34762
142	David, earl of Huntingdon (d.1219)	4	0.415728016	0
260	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	4	0.396964825	4.761905
782	Malcolm (I), earl of Fife (d.1229)	4	0.354665408	22.15
202	Andrew, bishop of Caithness (d.1184)	4	0.341100515	6.647619
1285	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	4	0.031545913	125
14	Robert de Quincy (d.1200)	3	0.335791812	0
197	William Lindsay (II) (d.c.1205)	3	0.318175936	0
83	David Oliphant (12C)	3	0.231416077	0
307	Robert of London (d.1225)	3	0.200660513	9.5
1357	Walter Comyn, earl of Menteith (d.1258)	3	0.022962	1
1378	Walter Stewart (II), son of Alan (d.1241)	3	0.020823347	34
798	Richard de Prebenda, bishop of Dunkeld (d.1210)	2	0.221113113	0
143	Ingram, bishop of Glasgow (d.1174)	2	0.123284034	0
79	Hugh de Moreville (I) (d.1162)	2	0.117799785	0
1281	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	2	0.052279969	150
1420	Henry Balliol (d.1246)	2	0.017365084	0
204	Waltheof, earl of Dunbar (d.1182)	1	0.108132043	0
419	Archibald, abbot of Dunfermline (d.1198)	1	0.082085521	0
4	Ness, son of William, lord of Leuchars (d.1178x83)	1	0.078788889	0
750	Robert Barclay, brother of Walter	1	0.068866984	0
134	Richard, bishop of St Andrews (d.1178)	1	0.061168862	0
39	Hugh de Sigillo, bishop of Dunkeld (d.1229 or 1230)	1	0.042646323	0
1106	Philip de Mowbray	1	0.042646323	0
435	William of Bondington, bishop of Glasgow (d.1258)	1	0.007292998	0

There are 36 individuals who witness together more than 20 times in the H1 study, as compared to 89 people who witnessed in the study of all witnesses across the whole database. As in the larger study, Duncan (II), earl of Fife (d. 1204) has the highest eigenvector centrality, with the next person, the constable Richard de Moreville (d. 1189 or 1190), having an eigenvector centrality just over three-quarters that of Earl Duncan. Earl Duncan also witnessed alongside more people than any other person, with a degree of 15. In other words, of all the people who co-witnessed more than 20 times, Earl Duncan witnessed alongside 38 percent of them. Ranking the top players by degree, nine individuals were in the top ten in both lists. William Comyn, earl of Buchan (d. 1233), was number 11 among all witnesses and rose to number nine in royal documents only, while Gilbert or Gilla Brigte, earl of Strathearn (d.1223), number 8 among all witnesses, fell to number 14 in the H1 study. This clearly demonstrates how important the royal documents are as a component of the whole dataset, despite making up only about a quarter of the total. Still, the other documents bolster the numbers considerably: while Duncan (II), earl of Fife (d. 1204) witnessed alongside 15 people in royal documents more than 20 times, among all documents (five specified types) he was connected to 25 people at that level. Earl Duncan, in addition to being heavily involved in royal documents, was also a frequent visitor in non-royal documents (more on this phenomenon later). Gilbert or Gilla Brigte, earl of Strathearn (d.1223) co-witnessed with ten people altogether more than 20 times, but only with four people in the royal documents – thus it would appear the majority of his connections came from royal documents. Most dramatic of all is the case of William del Bois, chancellor (d. 1232), who was in second place among all documents, but fell to tenth place in the H1 study. The number of people with whom he witnessed more than 20 times halved from 14 among all witnesses to 7 among witnesses to royal documents. Despite being a prominent royal clerk and chancellor, it would appear than many of his connections came from non-royal charters.

Figure 5.13. Netdraw: witnesses to H1 documents, >25 co-witnessing acts

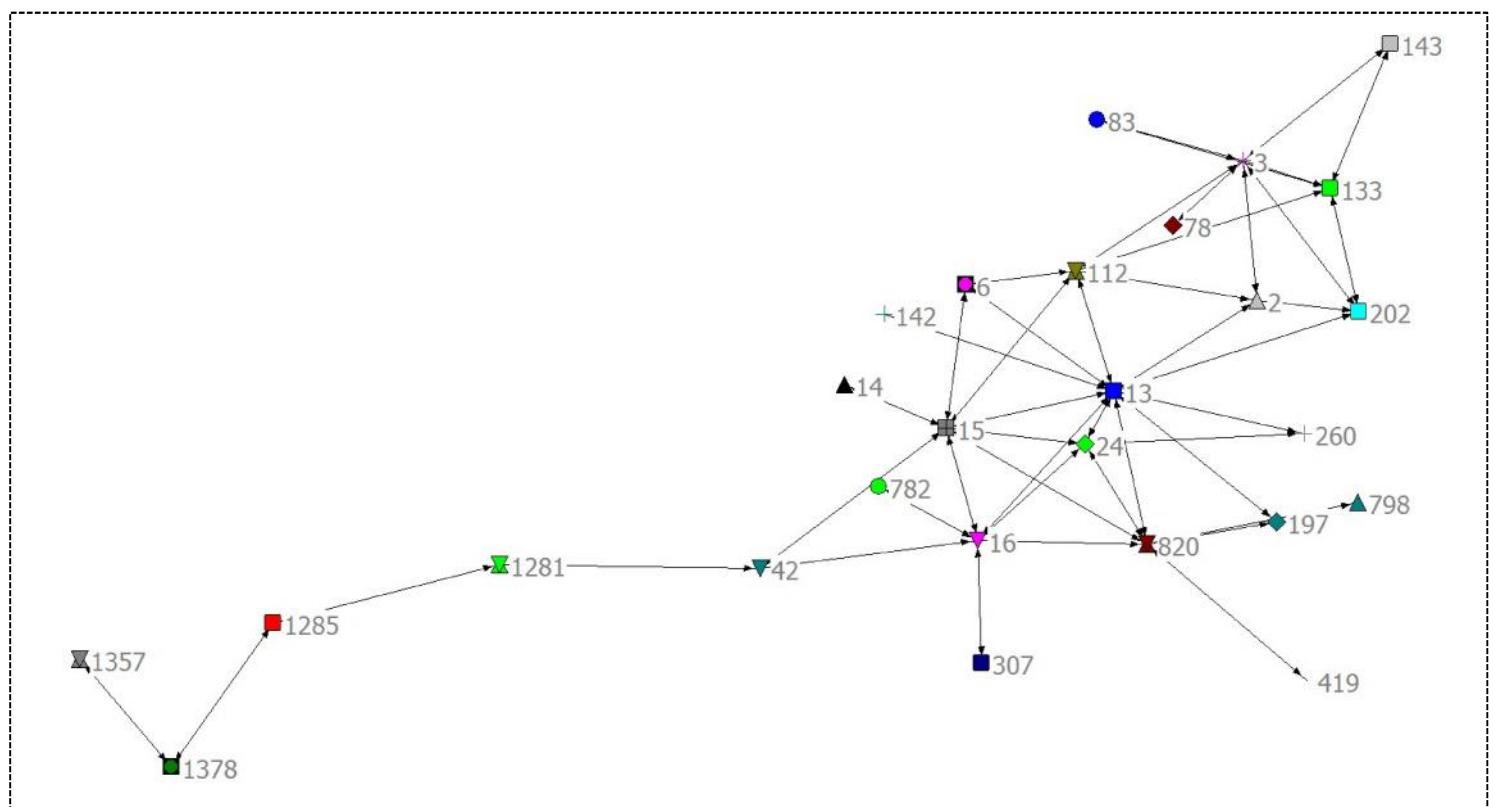
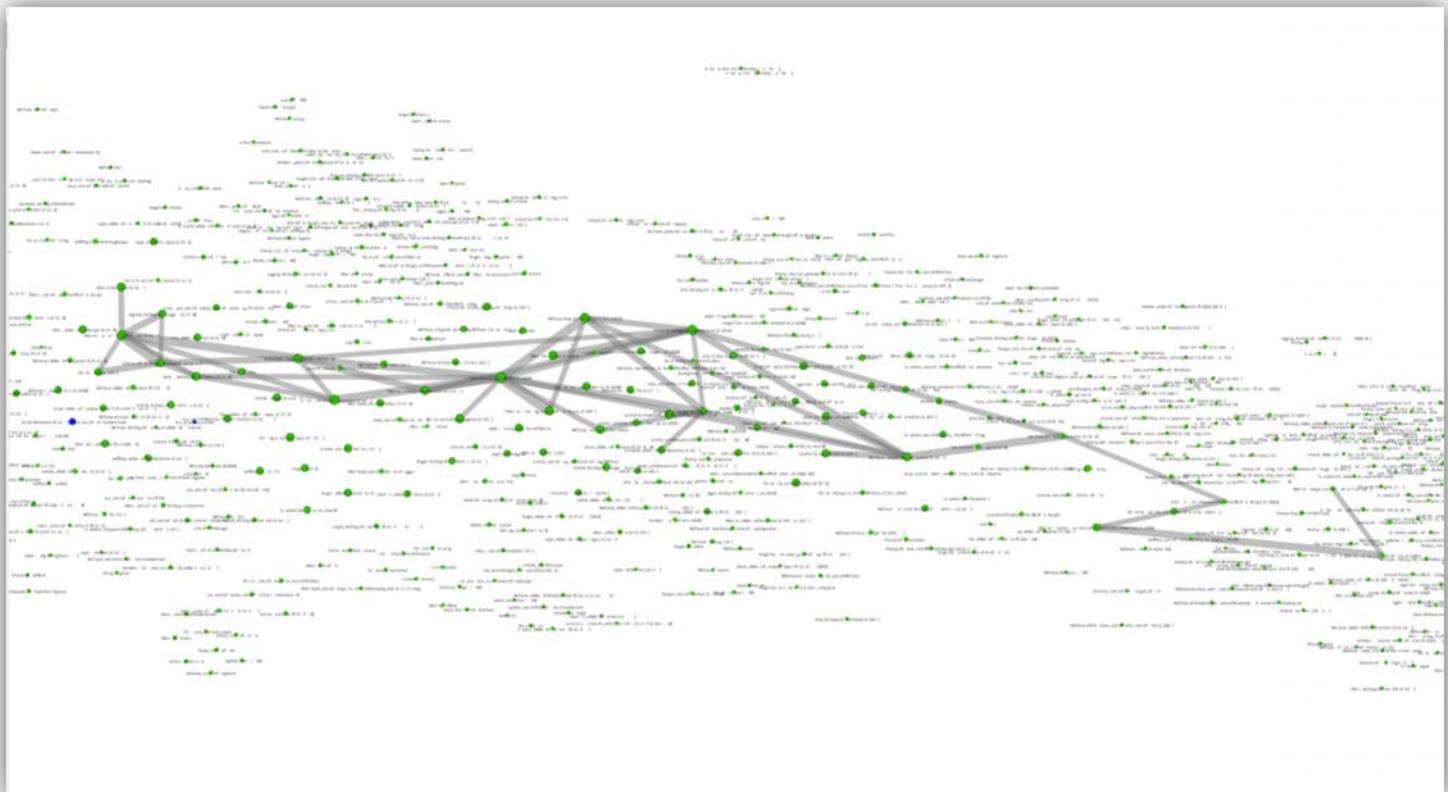


Figure 5.14. Gephi: witnesses to H1 documents, >25 co-witnessing instances



At the level of more than 25 co-witnessing acts, the number of players left has fallen from 36 to 27 (see Table 5.6). The structure of the sociogram at this level (see Figure 5.11). The central position of [13] Duncan (II), earl of Fife (d.1204) is obvious, and both he and [15] Philip de Valognes, chamberlain (d.1215) are part of a number of cliques, such as the four-person clique involving both [13] and [15] as well as [112] Richard de Moreville (d. 1189 or 1190) and [6] Walter Barclay, chamberlain (d.c.1193), or the five-person clique involving [13] and [15] as well as [24] William Hay (I), lord of Errol (d.c.1201), [16] William Comyn, earl of Buchan (d.1233), and [820] Hugh of Roxburgh, bishop-elect of Glasgow (d.1199). This could suggest that at different chronological moments, the individuals in these cliques may have been not only involved in distinct two-person relationships, as we have mostly contemplated to this point, but also in small groups in which there were mutually reinforcing ties. Small groups of key players who knew each other well may have been vital for the smooth functioning of royal government, so cliques like these deserve further academic scrutiny. At an earlier period, a three-person clique including [112] Richard de Moreville (d. 1189 or 1190), [3] Walter Stewart (I), son of Alan (d.1177), and [143] Ingram, bishop of Glasgow (d.1174) is also worth considering. The evidence is not there for such groups after the reign of William I, although this of course does not mean they did not exist. [42] William del Bois, chancellor (d. 1232) is still important as the connector for [1281] John Maxwell, chamberlain, sheriff of Roxburgh (d.1241) with [15] and [16].

Table 5.6. Top degree individuals at &gt;25 connections

poms id	name	degree
<b>13</b>	Duncan (II), earl of Fife (d.1204)	11
<b>15</b>	Philip de Valognes, chamberlain (d.1215)	8
<b>16</b>	William Comyn, earl of Buchan (d.1233)	7
<b>3</b>	Walter Stewart (I), son of Alan (d.1177)	7
<b>820</b>	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	7
<b>112</b>	Richard de Moreville (d.1189 or 1190)	6
<b>24</b>	William Hay (I), lord of Errol (d.c.1201)	5
<b>133</b>	Nicholas of Roxburgh, chancellor (d.1171?)	5
<b>2</b>	Matthew, bishop of Aberdeen (d.1199)	4
<b>202</b>	Andrew, bishop of Caithness (d.1184)	4
<b>42</b>	William del Bois, chancellor (d.1232)	3
<b>6</b>	Walter Barclay, chamberlain (d.c.1193)	3
<b>143</b>	Ingram, bishop of Glasgow (d.1174)	2
<b>83</b>	David Oliphant (12C)	2
<b>260</b>	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	2
<b>197</b>	William Lindsay (II) (d.c.1205)	2
<b>1281</b>	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	2
<b>1285</b>	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	2
<b>1378</b>	Walter Stewart (II), son of Alan (d.1241)	2
<b>14</b>	Robert de Quincy (d.1200)	1
<b>78</b>	Walter de Bidun (d.1178)	1
<b>142</b>	David, earl of Huntingdon (d.1219)	1
<b>419</b>	Archibald, abbot of Dunfermline (d.1198)	1
<b>307</b>	Robert of London (d.1225)	1
<b>798</b>	Richard de Prebenda, bishop of Dunkeld (d.1210)	1
<b>782</b>	Malcolm (I), earl of Fife (d.1229)	1
<b>1357</b>	Walter Comyn, earl of Menteith (d.1258)	1

Figure 5.15. Netdraw: witnesses to H1 documents, >30 co-witnessing acts

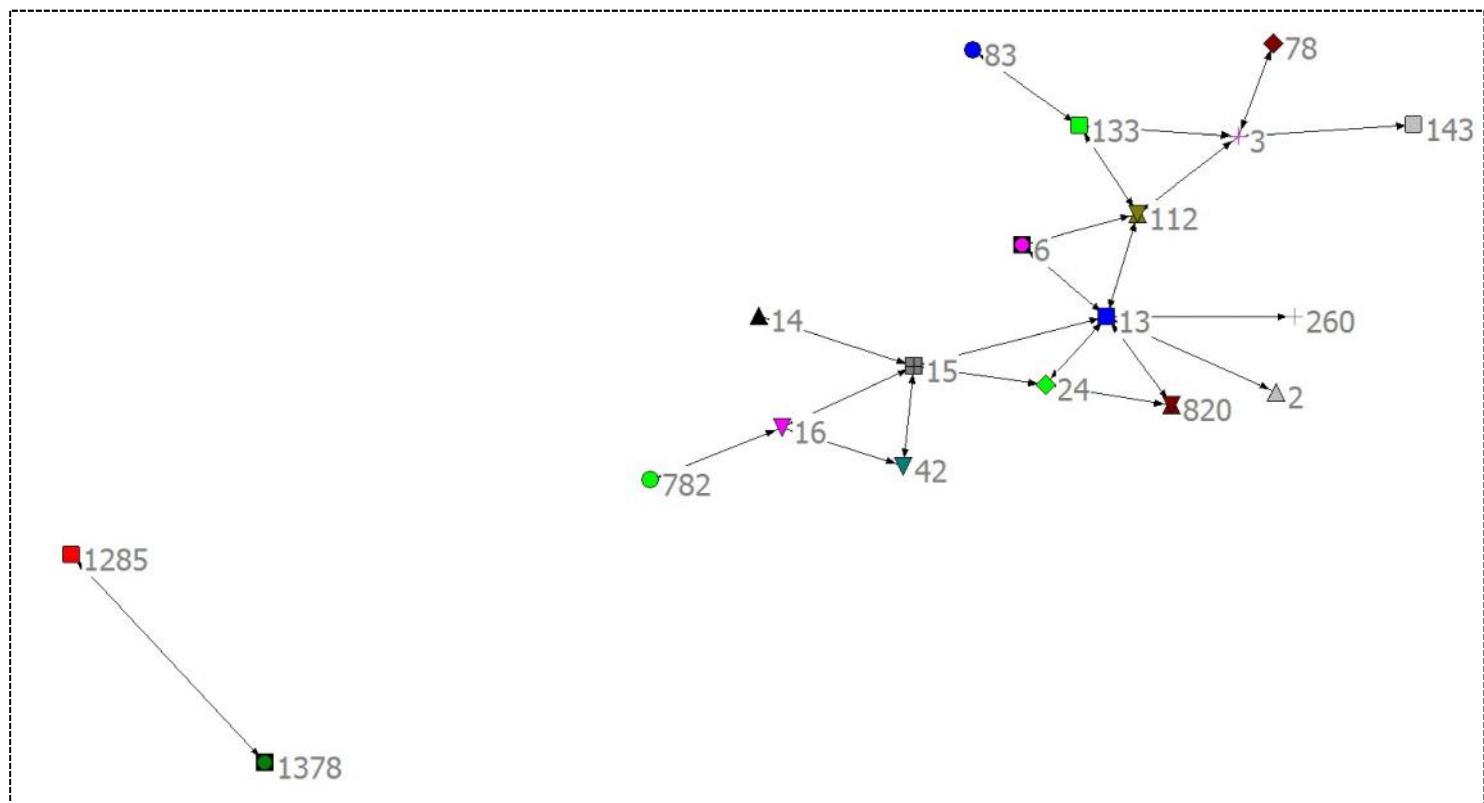
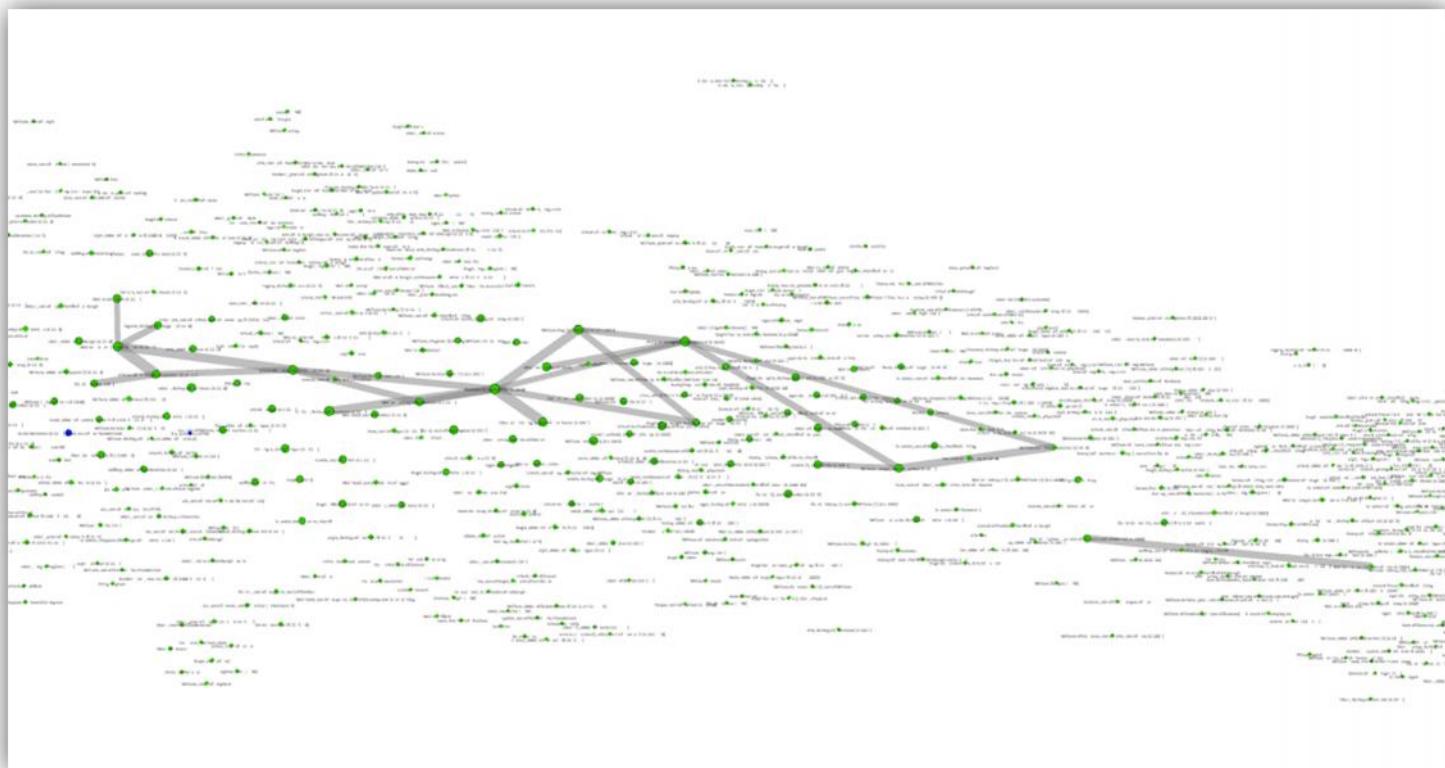


Figure 5.16. Gephi: witnesses to H1 documents, >30 co-witnessing instances



Comparison of the Netdraw and Gephi sociograms for the level of more than 30 co-witnessing instances. In the Netdraw version, it is clear that the dyad of [1285] and [1378] has detached from the main segment. In the Gephi sociogram, however, there is a clearer sense of where this dyad rests within the structure of the graph, and where the disconnect has opened up. The Netdraw graph reveals that [13] Earl Duncan is still by far the most central figure, functioning as the only point of contact between [820], [24], and [15], on one side, and [112], [6], and [260] on the other. [3] Walter son of Alan, the steward (d. 1177) is also in a key position, at the nexus of four actors – [143], [133], [78], and [112]. Figures 5.17, 5.18, and 5.19 give three close-up views of a labelled Gephi graph of the network of people who co-witness royal documents more than 30 times.

Figure 5.17. Gephi: close-up, >30 co-witnessing instances

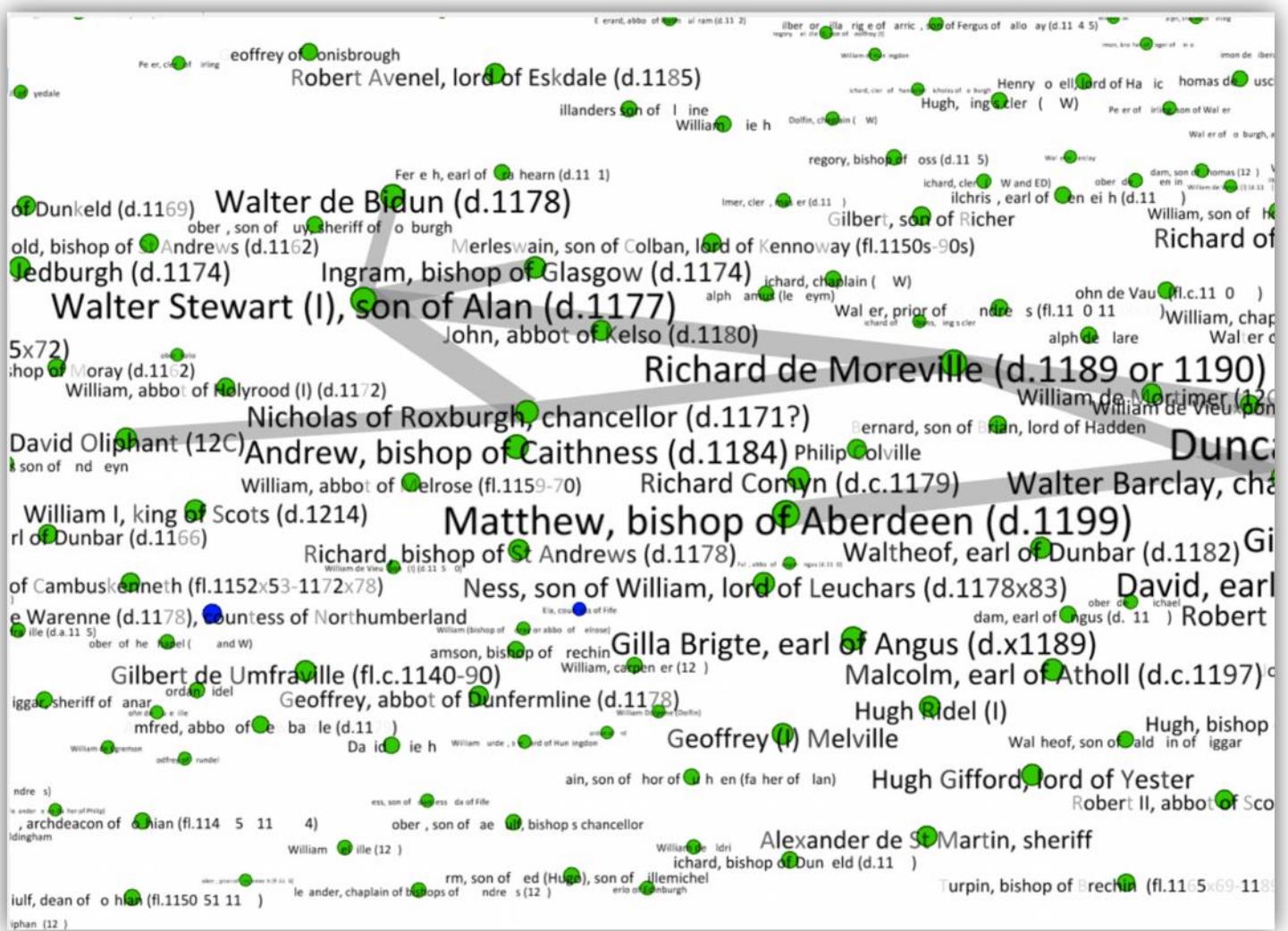


Figure 5.18. Gephi: close-up, >30 co-witnessing instances

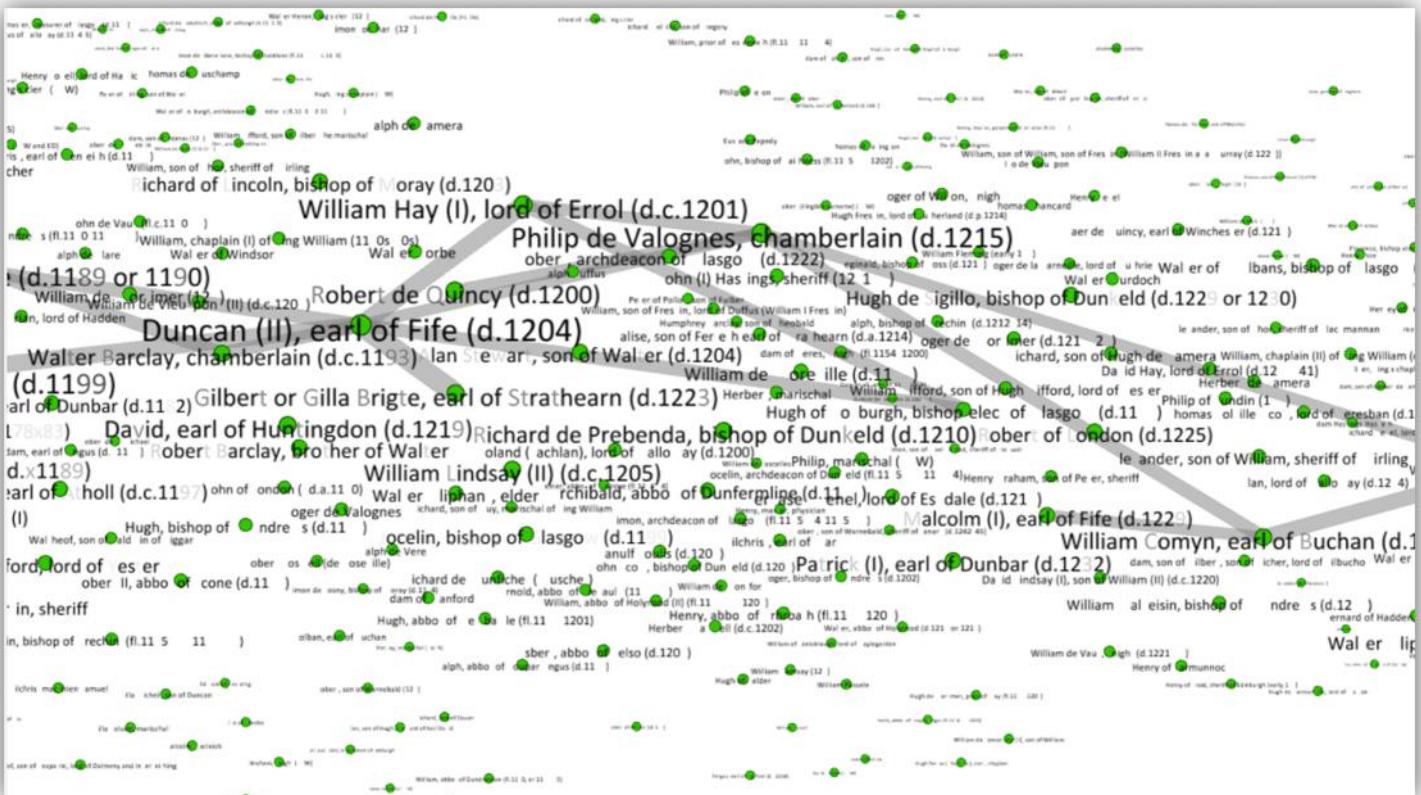


Figure 5.19. Gephi: close-up, >30 co-witnessing instances

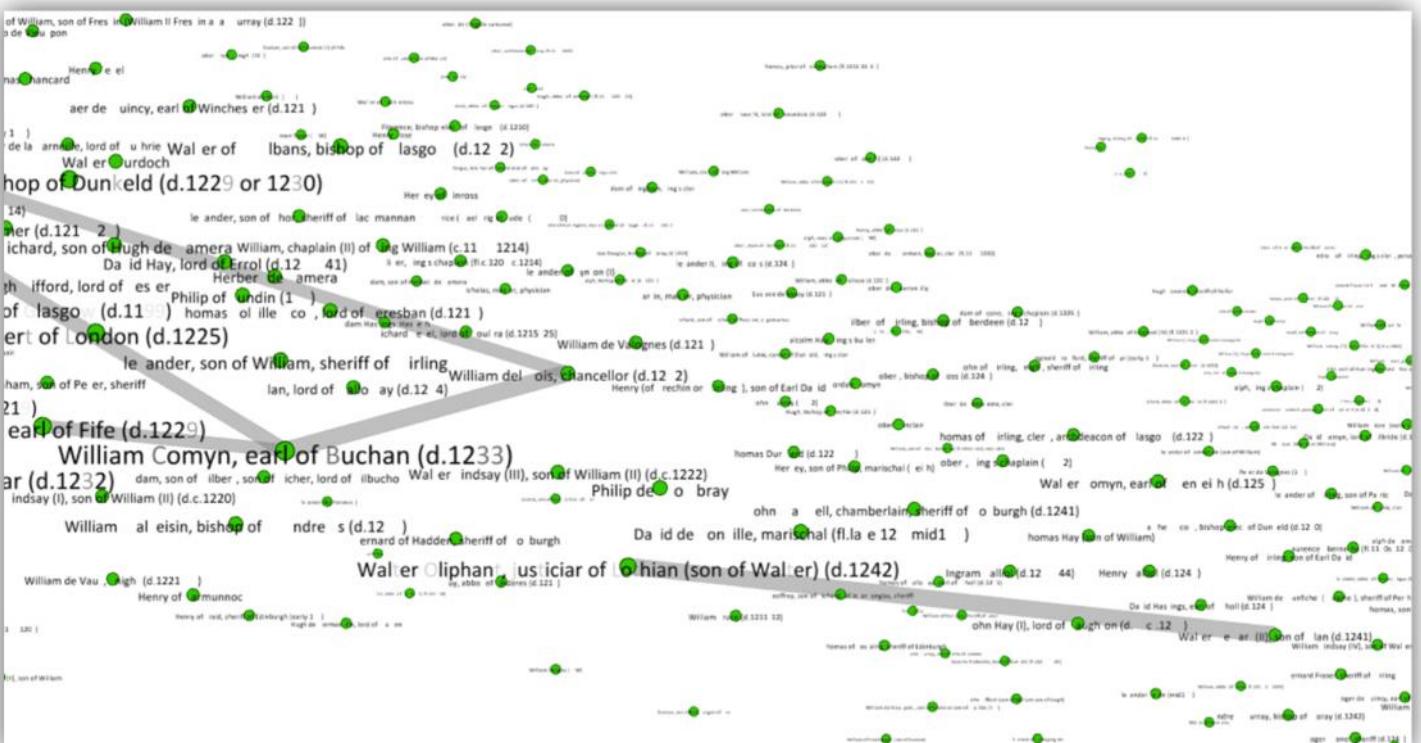


Figure 5.20. Netdraw: witnesses to H1 documents, >35 co-witnessing acts

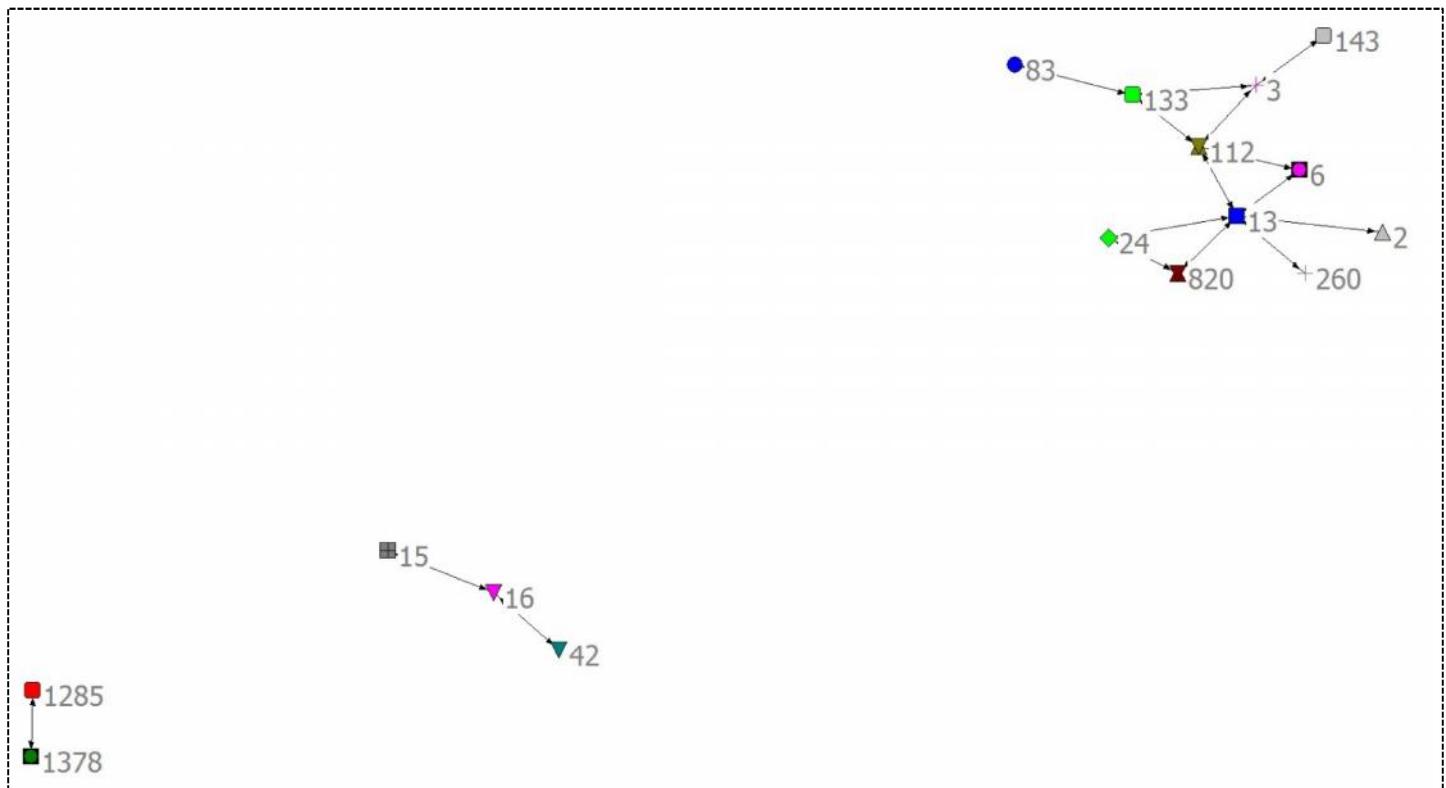
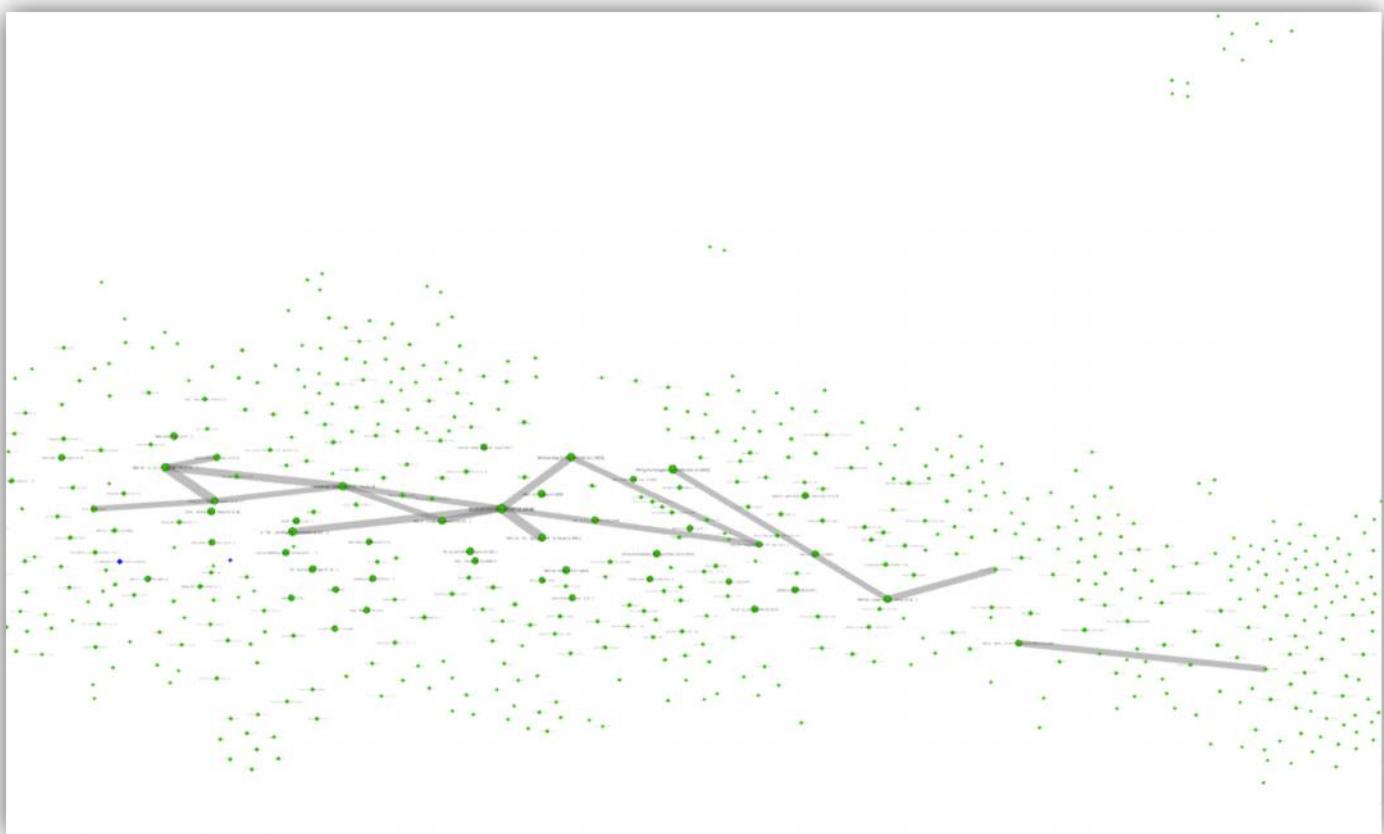
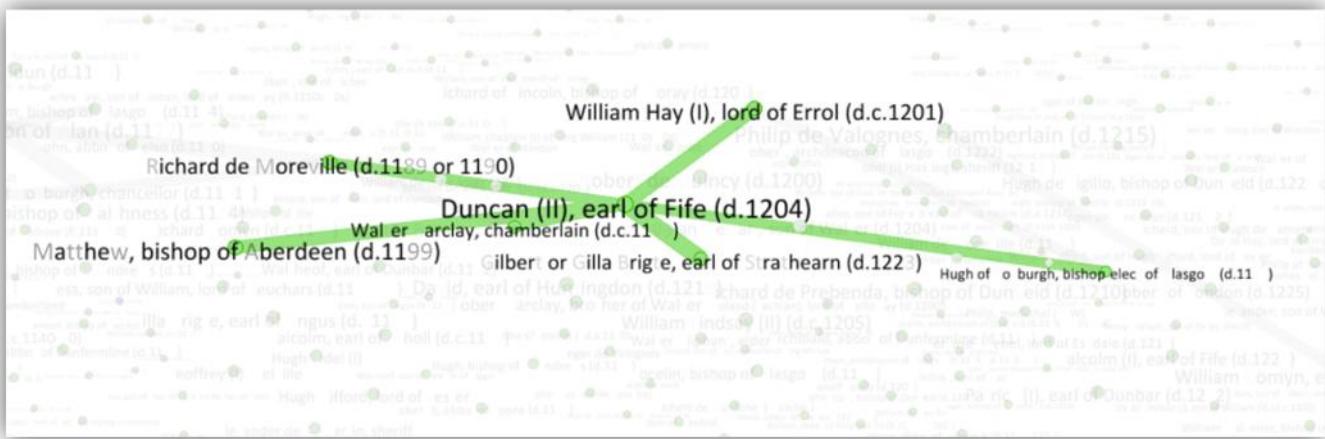


Figure 5.21. Gephi: witnesses to H1 documents, >35 co-witnessing instances



Figures 5.20 and 5.21 show the network at the level of more than 35 co-witnessing acts. Now, the network has broken into three segments. Again, the Netdraw version highlights the graph structure and the Person ID numbers, while the Gephi version shows the position in the larger graph that these three segments occupied. [13] Earl Duncan (II) is still a connector for five other actors at this level. These are illustrated in Figure 5.22, a labelled Gephi sociogram where the connections of Earl Duncan have been highlighted.

Figure 5.22. Gephi: witnesses to H1 documents, >35 co-witnessing instances



Figures 5.23 and 5.24, below, show the network at the level of more than 40 co-witnessing acts, where it has segmented into four, leaving two dyads and two triads. These represent the two or three people who witnessed together most often at four chronological points, from the mid-twelfth century, to the early-mid thirteenth century. These four groups are listed chronologically in Table 5.7. Again, it is helpful to compare the Netdraw sociogram to the Gephi sociogram, where the four distinct chronological positions in the overall network structure are made clear. The two earlier groups are shown in the labelled Gephi close-up, Figure 5.25. These two groups remain unchanged at the level of more than 45 co-witnessing acts (see Figure 4.27); indeed they are all that remain at that level (see Figure 4.26).

Figure 5.23. Netdraw: witnesses to H1 documents, >40 co-witnessing acts

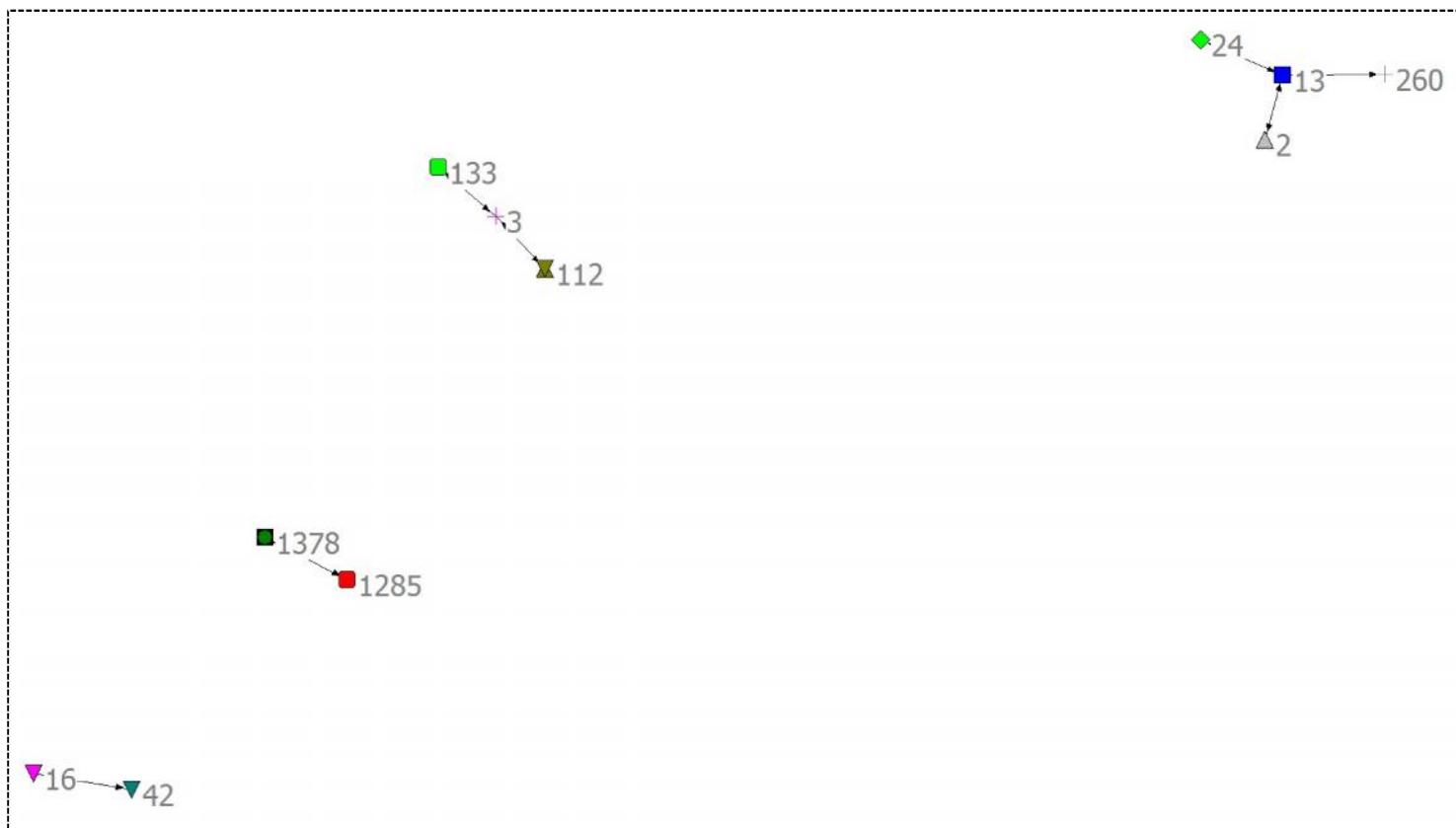


Figure 5.24. Gephi: witnesses to H1 documents, >40 co-witnessing instances

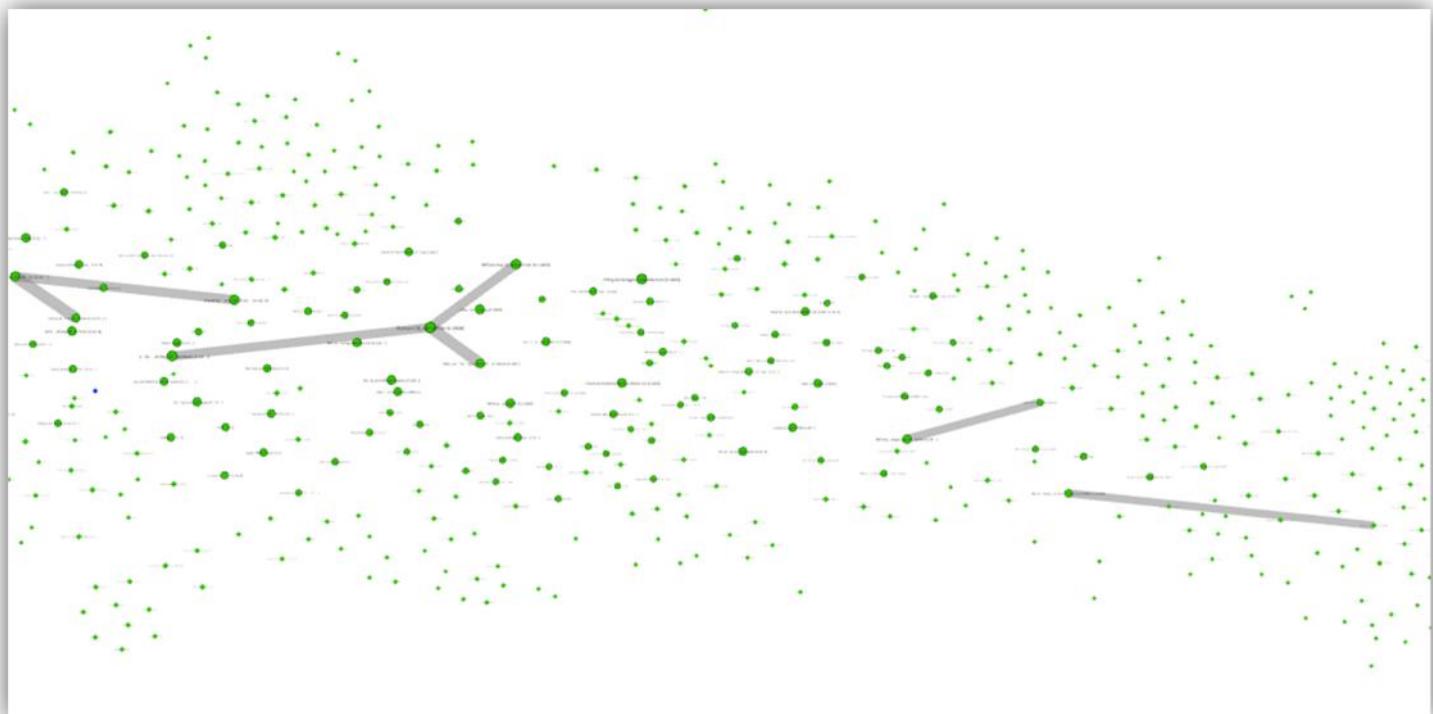


Table 5.7. Four distinct segments at level of &gt;40

	<b>Person 1</b>		<b>Person 2</b>		<b>Person 3</b>
<b>133</b>	Nicholas of Roxburgh, chancellor (d.1171?)	<b>3</b>	Walter Stewart (I), son of Alan (d.1177)	<b>112</b>	Richard de Moreville (d.1189 or 1190)
<b>24</b>	William Hay (I), lord of Errol (d.c.1201)	<b>13</b>	Duncan (II), earl of Fife (d.1204)	<b>260</b>	Gilbert or Gilla Brigte, e. Strathearn (d.1223)
<b>16</b>	William Comyn, earl of Buchan (d.1233)	<b>42</b>	William del Bois, chancellor (d.1232)		
<b>1285</b>	Walter Oliphant, justiciar of Lothian (d.1242)	<b>1378</b>	Walter Stewart (II), son of Alan (d.1241)		

Figure 5.25. Gephi: close-up, &gt;40 co-witnessing instances

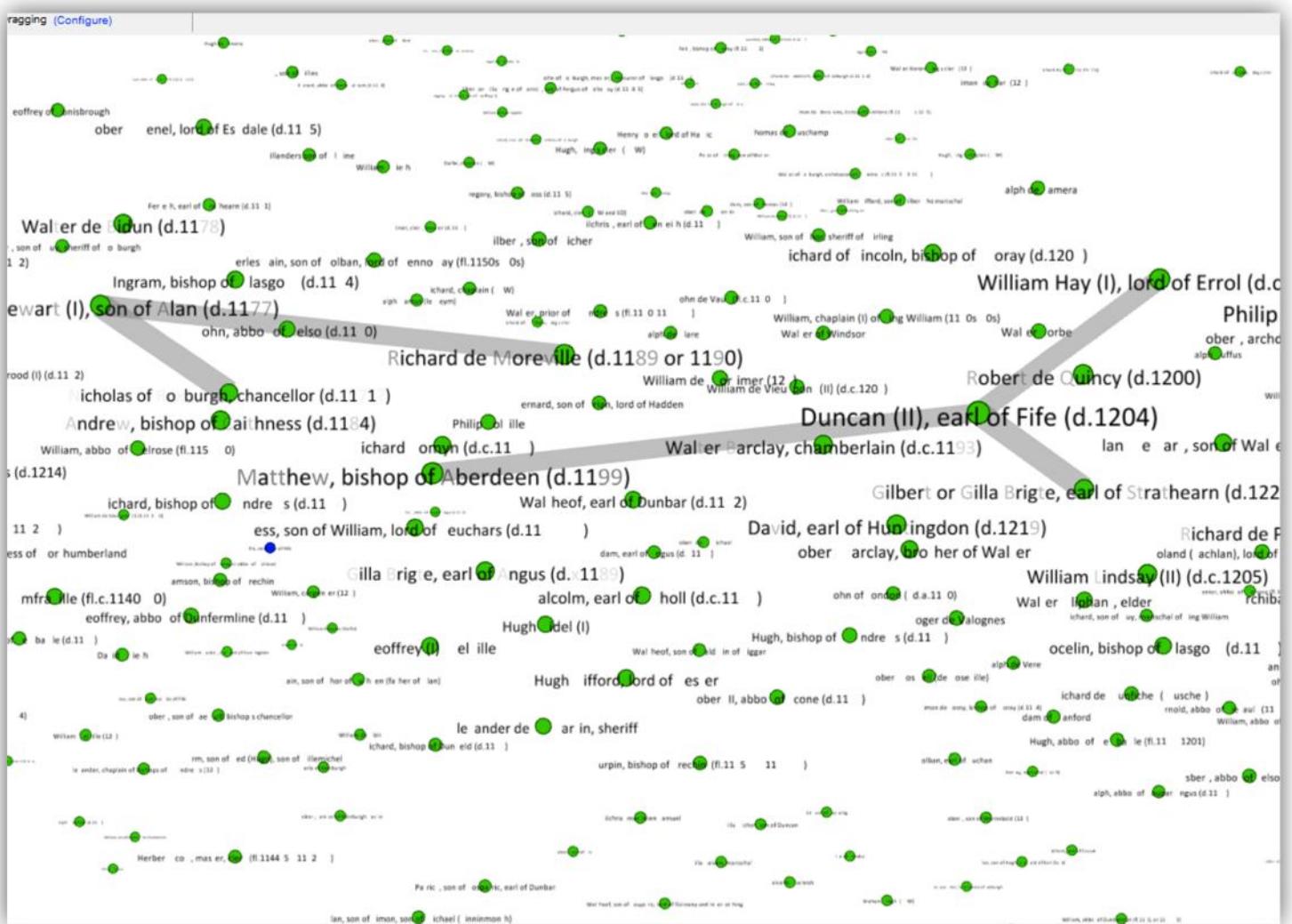


Figure 5.26. Netdraw: witnesses to H1 documents, >45 co-witnessing acts

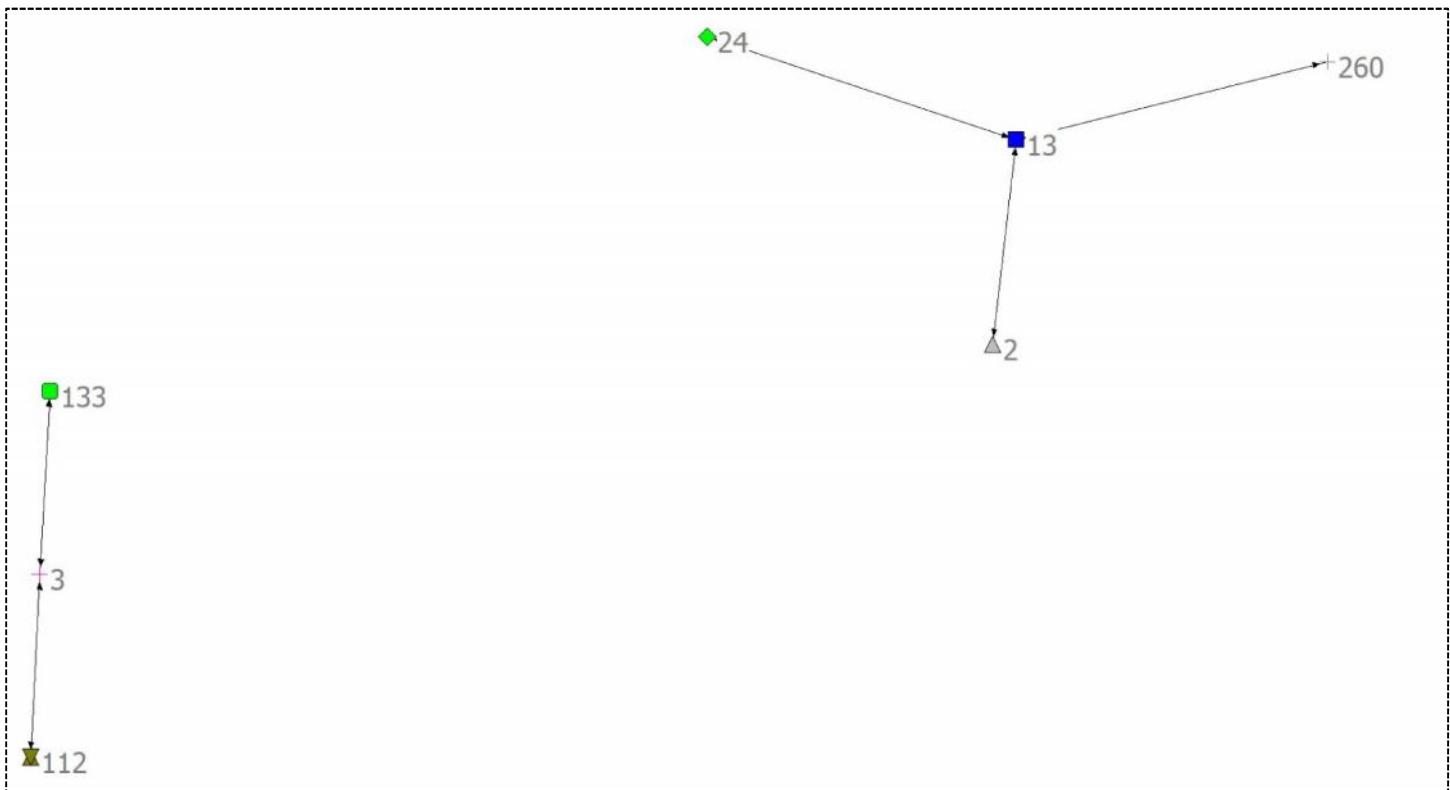


Figure 5.27. Gephi: witnesses to H1 documents, >45 co-witnessing instances

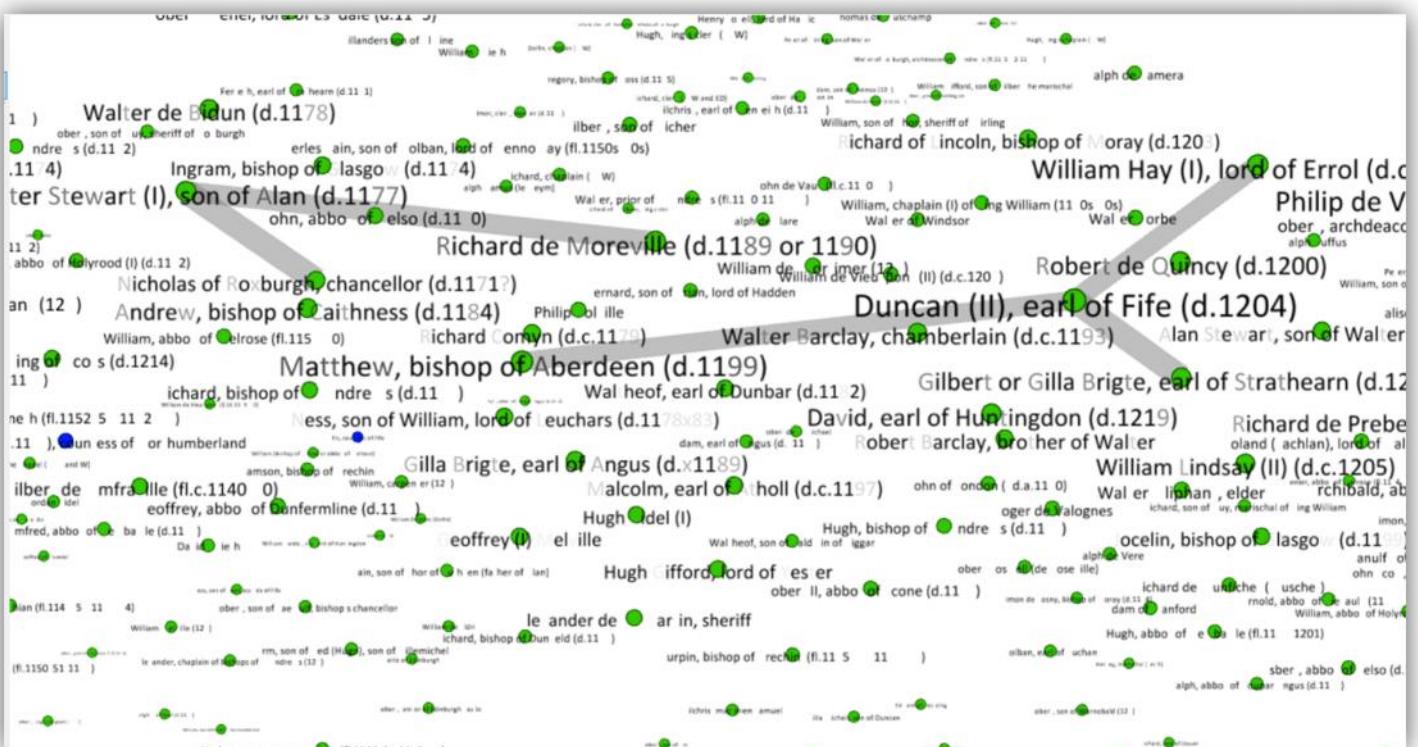
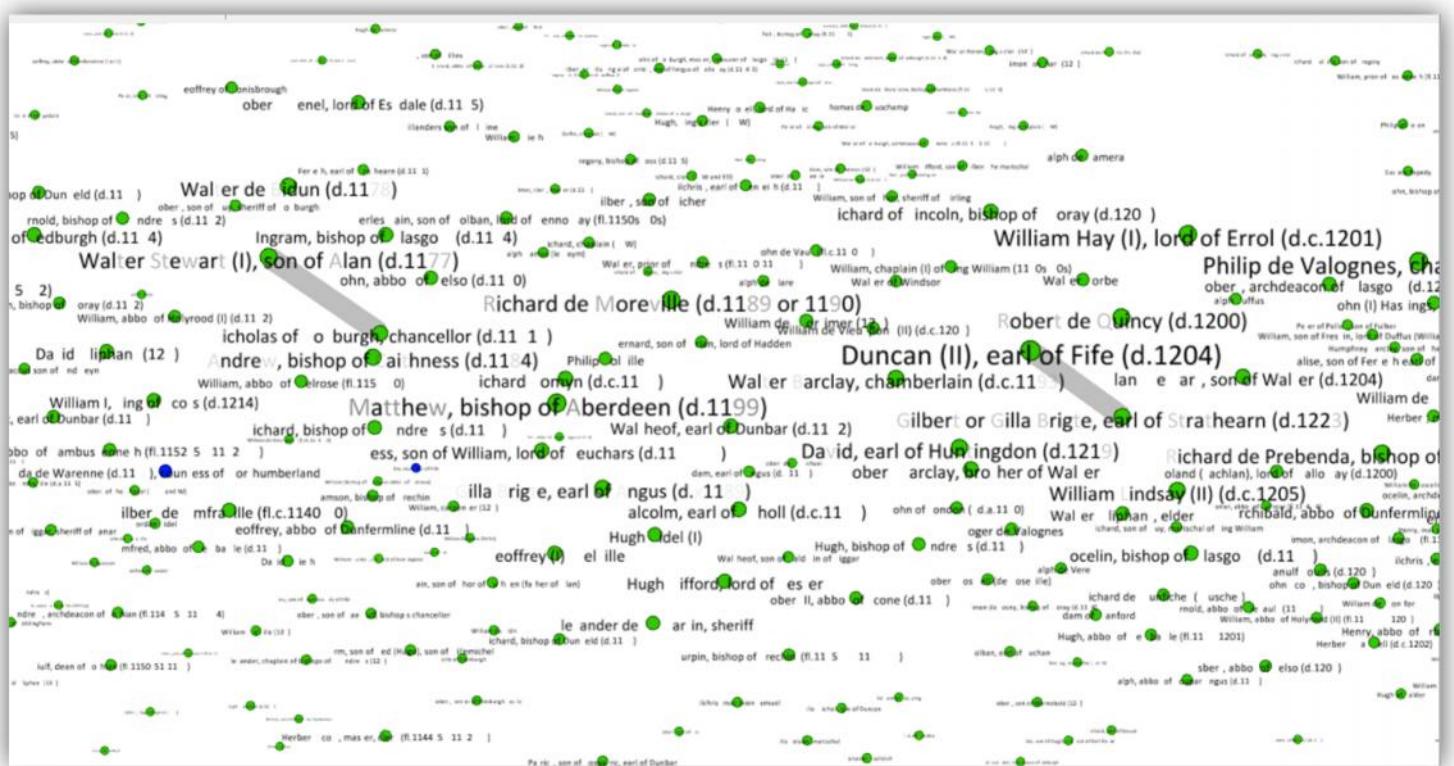


Figure 5.28. Netdraw: witnesses to H1 documents, >50 co-witnessing acts



Figure 5.29. Gephi: witnesses to H1 documents, >50 co-witnessing instances



As Figures 5.28 and 5.30 show, the two most active pairs in terms of co-witnessing royal documents are [13] Duncan (II), earl of Fife, and [260] Gilbert, earl of Strathearn, on one hand, and [3] Walter son of Alan, steward, and [133] Nicholas of Roxburgh, the chancellor, on the other. These are also visible as the two most productive co-witnessing ‘relationships’ in Table 5.8, the counterpart of Table 4.12 for the study of All Witnesses. While the (implicit) relationship between Earl Duncan and Earl Gilbert is by far the most productive in terms of co-witnessing among the whole database (5 specified document types), at the level of 78, this study shows that 60 (or 77%) of those documents are H1 documents, thus dropping them to number two in the league tables. 9 out of 27 – exactly one third – of these ‘relationships’ of pairs who witnessed together 30 or more times, included Earl Duncan (II), however, so Duncan’s prominent role as a royal charter witness is not within doubt. Number one here is the ‘relationship’ between Walter son of Alan the steward and Nicholas of Roxburgh, the chancellor, with 61 co-witnessing acts. However, they only witnessed 63 total documents together, thus showing that their ‘relationship’ took place almost entirely within the realm of royal charters (97% of their co-witnessing acts). This distinction is something historians should hold on to.

Table 5.8: Most productive co-witnessing ‘relationships’

Person 1	Person 2	# witness
Walter Stewart (I), son of Alan (d.1177)	Nicholas of Roxburgh, chancellor (d.1171?)	61
Duncan (II), earl of Fife (d.1204)	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	60
Duncan (II), earl of Fife (d.1204)	William Hay (I), lord of Errol (d.c.1201)	50
Richard de Moreville (d.1189 or 1190)	Walter Stewart (I), son of Alan (d.1177)	49
Duncan (II), earl of Fife (d.1204)	Matthew, bishop of Aberdeen (d.1199)	47
William Comyn, earl of Buchan (d.1233)	William del Bois, chancellor (d. 1232)	43
Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	Walter Stewart (II), son of Alan (d. 1241)	41
Duncan (II), earl of Fife (d.1204)	Richard de Moreville (d. 1189 or 90)	38
Philip de Valognes, chamberlain (d.1215)	William Comyn, earl of Buchan (d.1233)	38
Duncan (II), earl of Fife (d.1204)	Walter Barclay, chamberlain (d. ca 1193)	37
Duncan (II), earl of Fife (d.1204)	Hugh of Roxburgh, bp.-elect of Glasgow (d. 1199)	37
William Hay (I), lord of Errol (d.c.1201)	Hugh of Roxburgh, bp.-elect of Glasgow (d. 1199)	37
Richard de Moreville (d.1189 or 1190)	Walter Barclay, chamberlain (d. ca 1193)	37
Walter Stewart (I), son of Alan (d.1177)	Ingram, bishop of Glasgow (d. 1174)	37
Nicholas of Roxburgh, chancellor (d.1171?)	David Oliphant (12c)	37
Richard de Moreville (d.1189 or 1190)	Nicholas of Roxburgh, chancellor (d.1171?)	36
Robert de Quincy (d. 1200)	Philip de Valognes, chamberlain (d.1215)	33
Philip de Valognes, chamberlain (d.1215)	William Hay (I), lord of Errol (d.c.1201)	33
Duncan (II), earl of Fife (d.1204)	Philip de Valognes, chamberlain (d.1215)	32

Philip de Valognes, chamberlain (d.1215)	William del Bois, chancellor (d. 1232)	32
William Comyn, earl of Buchan (d.1233)	Malcolm (I), earl of Fife (d. 1229)	32
Walter de Bidun (d.1178)	Walter Stewart (I), son of Alan (d.1177)	31
Duncan (II), earl of Fife (d.1204)	William Comyn, earl of Buchan (d.1233)	30
Duncan (II), earl of Fife (d.1204)	William Lindsay (II) (d. ca 1205)	30
William Comyn, earl of Buchan (d.1233)	William Hay (I), lord of Errol (d.c.1201)	30
Matthew, bishop of Aberdeen (d.1199)	Walter Stewart (I), son of Alan (d.1177)	30
Matthew, bishop of Aberdeen (d.1199)	Andrew, bishop of Caithness (d. 1184)	30

Table 5.9. Top 20 witnesses by degree

poms id	name	degree	eigencentrality
13	Duncan (II), earl of Fife (d.1204)	277	1
3	Walter Stewart (I), son of Alan (d.1177)	247	0.784599
15	Philip de Valognes, chamberlain (d.1215)	246	0.868924
2	<i>Matthew, bishop of Aberdeen (d.1199)</i>	229	0.880611
16	William Comyn, earl of Buchan (d.1233)	223	0.70307
112	Richard de Moreville (d.1189 or 1190)	216	0.81025
24	William Hay (I), lord of Errol (d.c.1201)	205	0.823011
78	Walter de Bidun (d.1178)	185	0.681796
14	Robert de Quincy (d.1200)	183	0.764143
202	<i>Andrew, bishop of Caithness (d.1184)</i>	178	0.702159
1285	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	177	0.525037
142	David, earl of Huntingdon (d.1219)	171	0.735848
798	<i>Richard de Prebenda, bishop of Dunkeld (d.1210)</i>	171	0.704661
133	<i>Nicholas of Roxburgh, chancellor (d.1171?)</i>	170	0.624638
260	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	170	0.742893
1357	Walter Comyn, earl of Menteith (d.1258)	165	0.294849
782	Malcolm (I), earl of Fife (d.1229)	160	0.605062
197	William Lindsay (II) (d.c.1205)	159	0.691485
307	Robert of London (d.1225)	158	0.595621
6	Walter Barclay, chamberlain (d.c.1193)	155	0.686092

The top 20 actors (Table 5.9) in terms of the number of co-witnessing contacts they have (degree) is somewhat more balanced chronologically than the equivalent table for all witnesses. It includes top players from the mid-12<sup>th</sup> century, like [3] Walter Stewart (I) (d. 1177), [78] Walter de Bidun (d. 1178), and [133] Nicholas of Roxburgh (d. 1171), as well as a couple of actors from the mid-13<sup>th</sup> century, like [1285] Walter Oliphant, justiciar (d. 1242) and [1357] Walter Comyn, earl of Menteith (d. 1258). It also favours laymen more than the analysis of all witnesses, with only five churchmen in the top 20 (in

italics). When compared to the top 20 eigenvector league tables (Table 5.10), there seems to be a favouring of the 'sweet spot' era of the late twelfth and early thirteenth century, with figures like [260] Gilbert or Gilla Brigte, earl of Strathearn (d.1223), [6] Walter Barclay, chamberlain (d.c.1193), [110] Gilla Brigte, earl of Angus (d. ×1189) rising significantly in the rankings.

Table 5.10. Top 20 witnesses by eigenvector centrality

rank	poms id	name	degree	eigencentrality	movement
1	13	Duncan (II), earl of Fife (d.1204)	277	1	-
2	2	<i>Matthew, bishop of Aberdeen (d.1199)</i>	229	0.880611	↑ (2)
3	15	Philip de Valognes, chamberlain (d.1215)	246	0.868924	-
4	24	William Hay (I), lord of Errol (d.c.1201)	205	0.823011	↑ (3)
5	112	Richard de Moreville (d.1189 or 1190)	216	0.81025	↑ (1)
6	3	Walter Stewart (I), son of Alan (d.1177)	247	0.784599	↓ (4)
7	14	Robert de Quincy (d.1200)	183	0.764143	↑ (1)
8	260	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	170	0.742893	↑ (6)
9	142	David, earl of Huntingdon (d.1219)	171	0.735848	↑ (3)
10	798	<i>Richard de Prebenda, bishop of Dunkeld (d.1210)</i>	171	0.704661	↑ (3)
11	16	William Comyn, earl of Buchan (d.1233)	223	0.70307	↓ (6)
12	202	<i>Andrew, bishop of Caithness (d.1184)</i>	178	0.702159	↓ (2)
13	197	William Lindsay (II) (d.c.1205)	159	0.691485	↑ (5)
14	6	Walter Barclay, chamberlain (d.c.1193)	155	0.686092	↑ (6)
15	78	<i>Walter de Bidun (d.1178)</i>	185	0.681796	↓ (8)
16	110	Gilla Brigte, earl of Angus (d.×1189)	144	0.660633	↑(11)
17	444	Patrick (I), earl of Dunbar (d.1232)	148	0.625511	↑ (5)
18	133	<i>Nicholas of Roxburgh, chancellor (d.1171?)</i>	170	0.624638	↓ (4)
19	782	Malcolm (I), earl of Fife (d.1229)	160	0.605062	↓ (2)
20	750	Robert Barclay, brother of Walter	126	0.597939	↑(18)

Individuals active in the early-to-mid thirteenth century appear higher in the rankings when we consider the degree divided by the number of documents witnessed. [42] William del Bois, [1281] John Maxwell, [1378] Walter Stewart (II), [16] William Comyn, earl of Buchan and [1135] David de Bonville, marischal are all among the ten people with the lowest quotient of witnessing acts divided by number of 'contacts'. While [13] Duncan (II) earl of Fife and [15] Philip de Valognes witnessed more charters, 146 and 145 respectively, the size of their networks of witnessing 'contacts' were not as large proportionally. The table includes all the men from the top 20 by degree and eigenvector, plus additional people who witnessed more than 50 documents.

Table 5.11. Degree divided by documents witnessed

poms id	name	Eigen-vector	x100	degree	Docs W (SD)	Degree/ docs w
42	William del Bois, chancellor (d.1232)	0.351244	35	147	121	1.215
1281	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	0.298488	30	131	98	1.337
750	Robert Barclay, brother of Walter	0.597939	60	126	53	1.337
820	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	0.490708	49	126	81	1.556
133	Nicholas of Roxburgh, chancellor (d.1171?)	0.624638	62	170	101	1.683
15	Philip de Valognes, chamberlain (d.1215)	0.868924	87	246	145	1.697
1378	Walter Stewart (II), son of Alan (d.1241)	0.229194	23	124	71	1.746
16	William Comyn, earl of Buchan (d.1233)	0.70307	70	223	127	1.756
1135	David de Bonville, marischal (fl. late 12C-mid13C)	0.3751	38	144	76	1.895
13	Duncan (II), earl of Fife (d.1204)	1	100	277	146	1.897
143	Ingram, bishop of Glasgow (d.1174)	0.566544	57	148	78	1.897
6	Walter Barclay, chamberlain (d.c.1193)	0.686092	69	155	81	1.914
1285	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	0.525037	53	177	91	1.945
112	Richard de Moreville (d.1189 or 1190)	0.81025	81	216	111	1.946
1357	Walter Comyn, earl of Menteith (d.1258)	0.294849	29	165	82	2.012
1420	Henry Balliol (d.1246)	0.566544	57	113	56	2.018
444	Patrick (I), earl of Dunbar (d.1232)	0.625511	63	148	73	2.027
24	William Hay (I), lord of Errol (d.c.1201)	0.823011	82	205	97	2.113
3	Walter Stewart (I), son of Alan (d.1177)	0.784599	78	247	113	2.186
79	Hugh de Moreville (I) (d.1162)	0.37151	37	152	69	2.203
78	Walter de Bidun (d.1178)	0.681796	68	185	79	2.342
782	Malcolm (I), earl of Fife (d.1229)	0.605062	61	160	67	2.389
307	Robert of London (d.1225)	0.595621	60	158	66	2.394
197	William Lindsay (II) (d.c.1205)	0.691485	69	159	64	2.484
260	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	0.742893	74	170	68	2.5
202	Andrew, bishop of Caithness (d.1184)	0.702159	70	178	69	2.58
142	David, earl of Huntingdon (d.1219)	0.735848	74	171	62	2.758
2	Matthew, bishop of Aberdeen (d.1199)	0.880611	88	229	82	2.793
14	Robert de Quincy (d.1200)	0.764143	76	183	63	2.905
798	Richard de Prebenda, bishop of Dunkeld (d.1210)	0.704661	70	171	58	2.948
110	Gilla Brigte, earl of Angus (d.x1189)	0.660633	66	144	28	5.143

- Includes all the people from the degree and eigenvector lists, as well as everyone who has witnessed more than 50 documents

## PART TWO: REIGN BY REIGN

### DAVID I (1124-1153)

The study of the witnesses to the documents of King David I included 83 documents, of which two were notifications and the rest charters proper. This is out of a potential 91 documents: there were 8 charters with no witnesses. All of the co-witnessing studies use the dataset as of October 2014. There were 172 witnesses in the study with 2100 edges, all of whom were male.

Table 5.12. Top 15 witnesses to David I charters by degree

Name	PoMS ID	Degree	Betweeness	Eigenvector
Hugh de Moreville (I) (d.1162)	79	124	2509.27	1
John, bishop of Glasgow (d.1147)	191	111	2261.352	0.926809
Herbert, bishop of Glasgow (d.1164)	140	86	1405.496	0.676864
Duncan (I), earl of Fife (d.1154)	223	78	749.3725	0.648949
Walter Stewart (I), son of Alan (d.1177)	3	73	726.1376	0.742958
Edward, bishop of Aberdeen (d.1171)	317	72	556.8846	0.629261
William de Somerville (I) (fl. 1129x89)	184	70	367.4811	0.724648
William, son of King Duncan II (d.1151x4)	557	70	362.1623	0.706668
Herbert, king's chamberlain (fl. 1137x60)	152	68	799.0984	0.56447
William Lindsay (I) (fl. 1137x79)	1719	64	255.4254	0.710895
Robert, bishop of St Andrews (d.1159)	148	62	265.7765	0.566405
Hugh Brett (12C) (fl. 1124x43)	565	62	379.2131	0.653711
Alwine mac Arkil, the <i>rannaire</i> (1131x54)	206	60	382.4703	0.543498
Ascelin, archdeacon of Glasgow (fl.1126x7-1153x9)	190	59	190.9395	0.626347
Henry, earl of Northumberland and Huntingdon (d.1152)	90	57	316.6938	0.631238

The two most central individuals in David I's charters were his closest lay advisor, [79] Hugh de Moreville, whom David made his constable, and his longstanding closest ecclesiastical advisor, [191] John, bishop of Glasgow. Hugh was lord of Lauderdale (BWK) and probably Cunningham with Largs

(AYR) and John had been David's chaplain as earl of the Honour of Huntingdon from around 1114, and longserving bishop of Glasgow, from 1118 until his death in 1147. These two individuals had significantly higher centralities in terms of degree and eigenvector compared to the others (see Table 5.9). Their importance is demonstrated by the Gephi sociogram of witnesses to David's charters (see Figure 5.31).

The remaining close witnesses include family members, household officers and other household knights, as well as some clerics. The most central family members were the king's nephew and close political ally [557] William fitz Duncan (d. 1151×4), and his son and king-designate [90] Henry, earl of Northumberland and Huntingdon, son of King David (d. 1152). The centre of gravity for David's surviving acts is clearly south of the Firth of Forth, and the only prominent individuals based north of the Forth were Duncan (I), earl of Fife (d. 1154), Bishop Robert of St Andrews (d. 1159), and possibly Alwine mac Arkill, the rannaire (a court position). For much of David's reign, William fitz Duncan was ruler in the northern quasi-kingdom of Moray, while Earl Henry was earl in Northumberland. David spent much of his time in Teviotdale, Lothian, Strathclyde, and the area between Fife and Perth. It is likely that much of the running of the kingdom between the Forth and the Mounth (the high ground to the south of Aberdeen) was left to Earl Duncan, the king's chief ally in the old royal heartland of Alba, Scotia, or Scotland proper.

Other ecclesiastics who were frequent witnesses to David's charters included Robert, former prior of Scone who had been elected to the see of St Andrews shortly before David came to the throne, and was bishop for the entirety of David's reign, and Herbert, abbot of David's foundation at Selkirk from 1119 to 1147 (after 1127, at Kelso), and thereafter bishop of Glasgow. Another central churchman was Ascelin, archdeacon of Glasgow for likely the whole of David's reign. The importance of Bishop John, Archdeacon Ascelin, and Abbot John of Kelso in David's charters demonstrates the significance of the diocese of Glasgow to David's plans. As ruler of Cumbria for nearly ten years before raising to the throne, David's most ambitious innovations, such as the foundation of new monasteries at Selkirk/Kelso, Melrose, and Jedburgh, and the establishment of large new territorial lordships for his closest lay allies, such as Annandale, Cunningham, and Strathgryfe, were centred on the diocese of Glasgow.

Other laymen who were prominent in David's charters included Walter fitz Alan (d. 1177), who may have been made steward late in David's reign. While Hugh de Moreville was a Huntingdon landholder and knight who was attached to David by around 1114, and was made constable by 1140, Walter fitz Alan was a generation younger and was absent from the kingdom for part of David's reign. The steward

was clearly the junior partner to the constable at the time of David's death. Other household positions, as we might expect, appear frequently in David's charters. This includes Edward, bishop of Aberdeen (d. 1171), not because he was a bishop, but because he was royal chancellor for much of the 1140s. It also includes the king's chamberlain, Herbert, who held that office for the lion's share of David's reign. While it is not surprising to find household officers like these among the charter witnesses, what is noteworthy is when men who held no official title appear with prominence. This is especially true in David's reign, when royal administration was almost entirely personal and non-institutionalised. Thus, we see the knights William de Somerville, lord of Carnwath (LAN), William Lindsay (I), and Hugh Brett, among the most central players in David's reign.

Table 5.13. Positions held by most central players (churchmen in italics)

Name	PoMS ID	Position
Hugh de Moreville (I) (d.1162)	79	King's constable
<i>John, bishop of Glasgow (d.1147)</i>	191	Bishop of Glasgow
<i>Herbert, bishop of Glasgow (d.1164)</i>	140	Abbot of Kelso
Duncan (I), earl of Fife (d.1154)	223	Earl of Fife
Walter Stewart (I), son of Alan (d.1177)	3	King's steward (from late in reign)
<i>Edward, bishop of Aberdeen (d.1171)</i>	317	Chancellor
William de Somerville (I) (fl. 1129×89)	184	Knight
William, son of King Duncan II (d.1151x4)	557	King's nephew, ruler of Moray
Herbert, king's chamberlain (fl. 1137×60)	152	Chamberlain
William Lindsay (I) (fl. 1137×79)	1719	Knight
<i>Robert, bishop of St Andrews (d.1159)</i>	148	Bishop of St Andrews
Hugh Brett (12C) (fl. 1124×43)	565	Knight
Alwine mac Arkil, the <i>rannaire</i> (1131×54)	206	<i>rannaire</i>
<i>Ascelin, archdeacon of Glasgow (fl.1126x7-1153x9)</i>	190	archdeacon
Henry, earl of Northumberland and Huntingdon (d.1152)	90	King's son, earl of Northumberland and sometimes Huntingdon

The following series of sociograms reveals the key relationships between top players in David's reign. The overarching importance of Hugh de Moreville is clear throughout. The nodes in Figure 5.31 are adjusted according to Eigenvector centrality, allowing us to visualize the roles of Hugh and Bishop John in relation to all the other witnesses. As Figure 5.32 shows, among those who co-witness more than 3 times, the number of links with Hugh [79] and John [191] is already notable. As the labelled Gephi sociogram of more than 5 co-witnessing instances makes clear (Figure 5.33), most of those who witnessed more than 5 times were among the 15 most central players. Moreover, a chronological split can start to be discerned, with the older generation towards the bottom and the younger generation towards the top. At this point, the centrality of Hugh de Moreville is paramount.

Figure 5.30. Netdraw sociogram of witnesses to King David documents

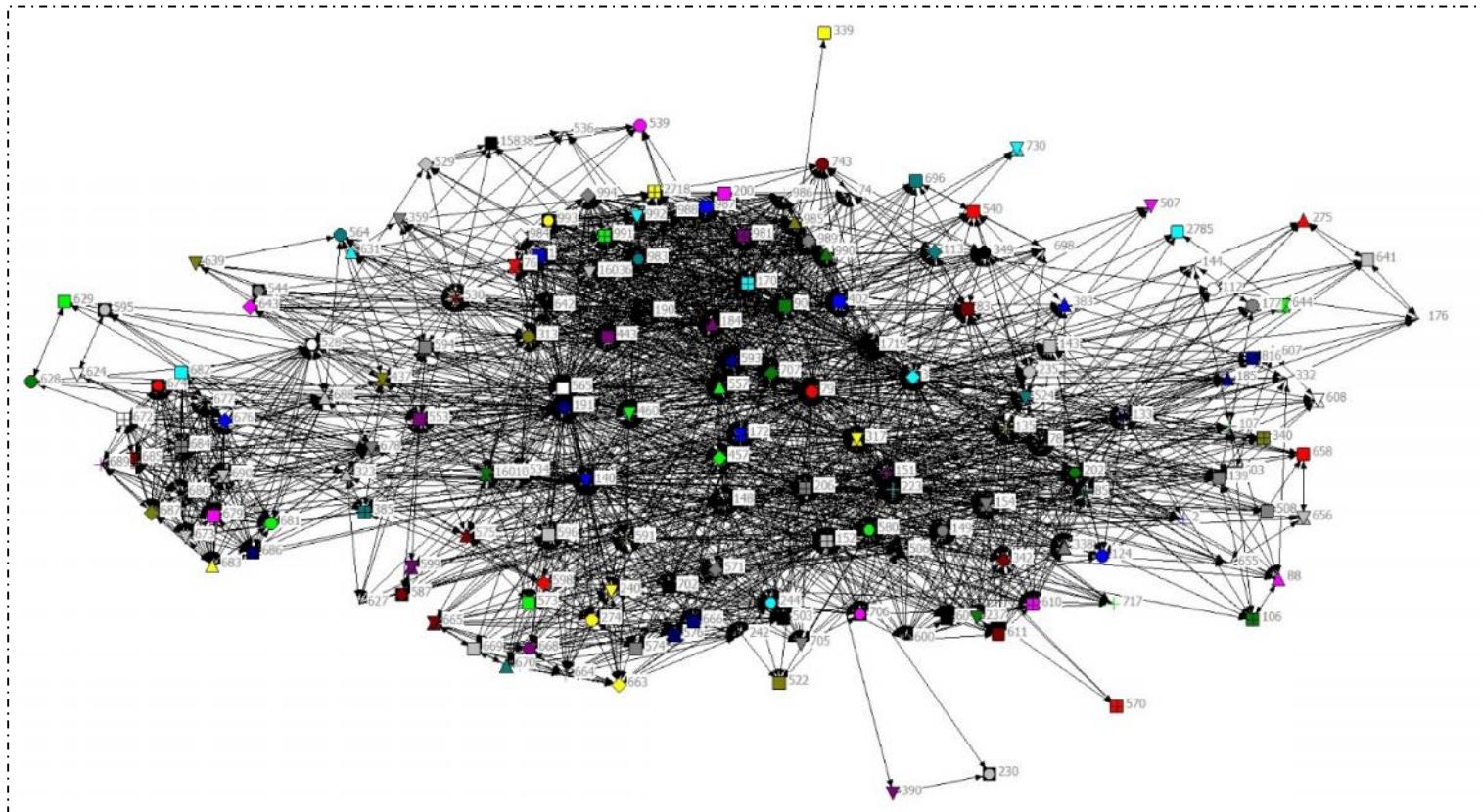


Figure 5.31. Gephi sociogram of witnesses to King David documents

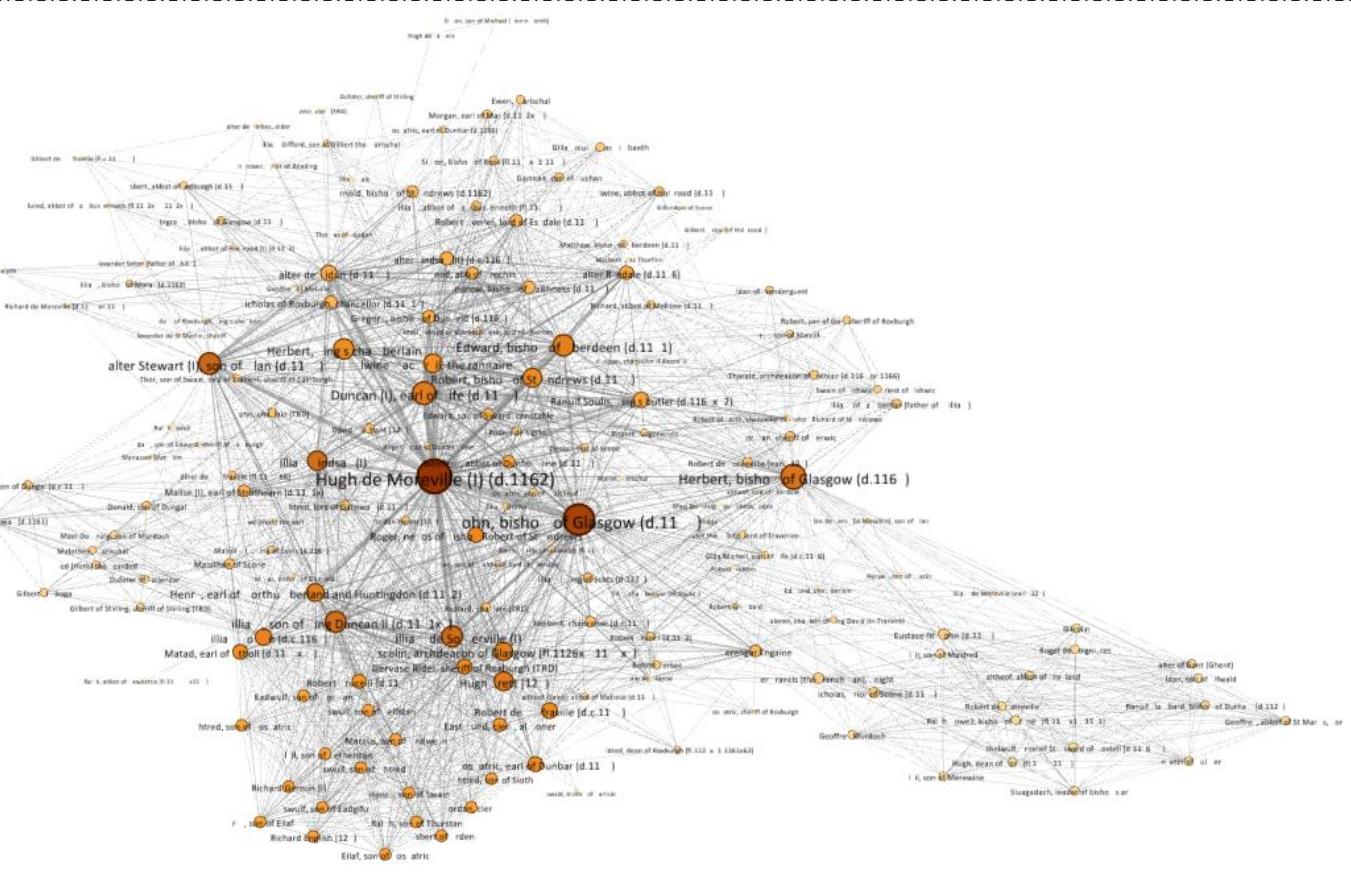


Figure 5.32. Netdraw, David I: more than 3 co-witnessing acts

This Netdraw visualization provides a simplified view of the network, focusing on nodes that have participated in more than three co-witnessing acts. The graph is rendered using a radial layout, where a central hub node (colored red) is connected to several peripheral nodes, some of which are further connected to others, forming a star-like structure with additional branches. The nodes are represented by various shapes and colors, and the edges are black lines indicating the connections between them. This visualization highlights the key players and their extensive involvement in the legal and administrative framework of King David I's reign.

Figure 5.33. Gephi, David I: more than 5 co-witnessing acts

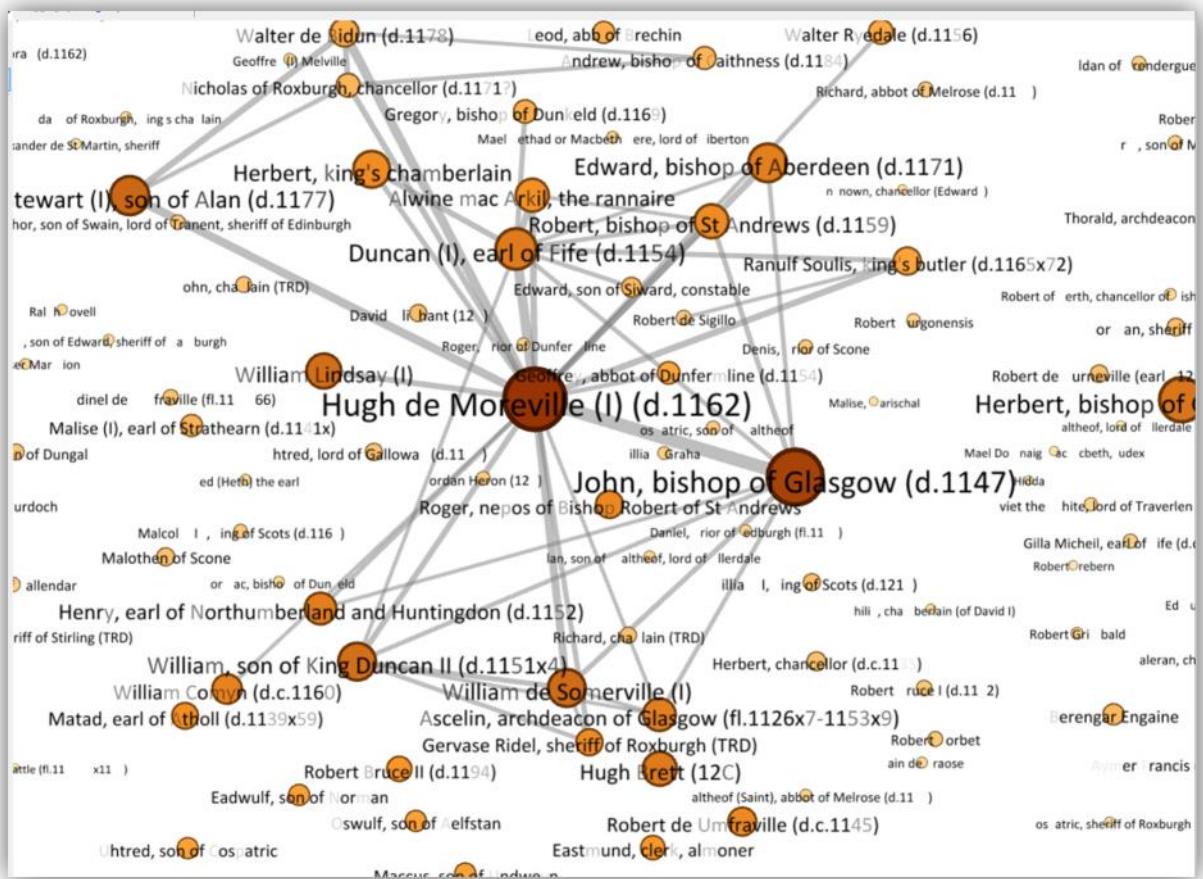
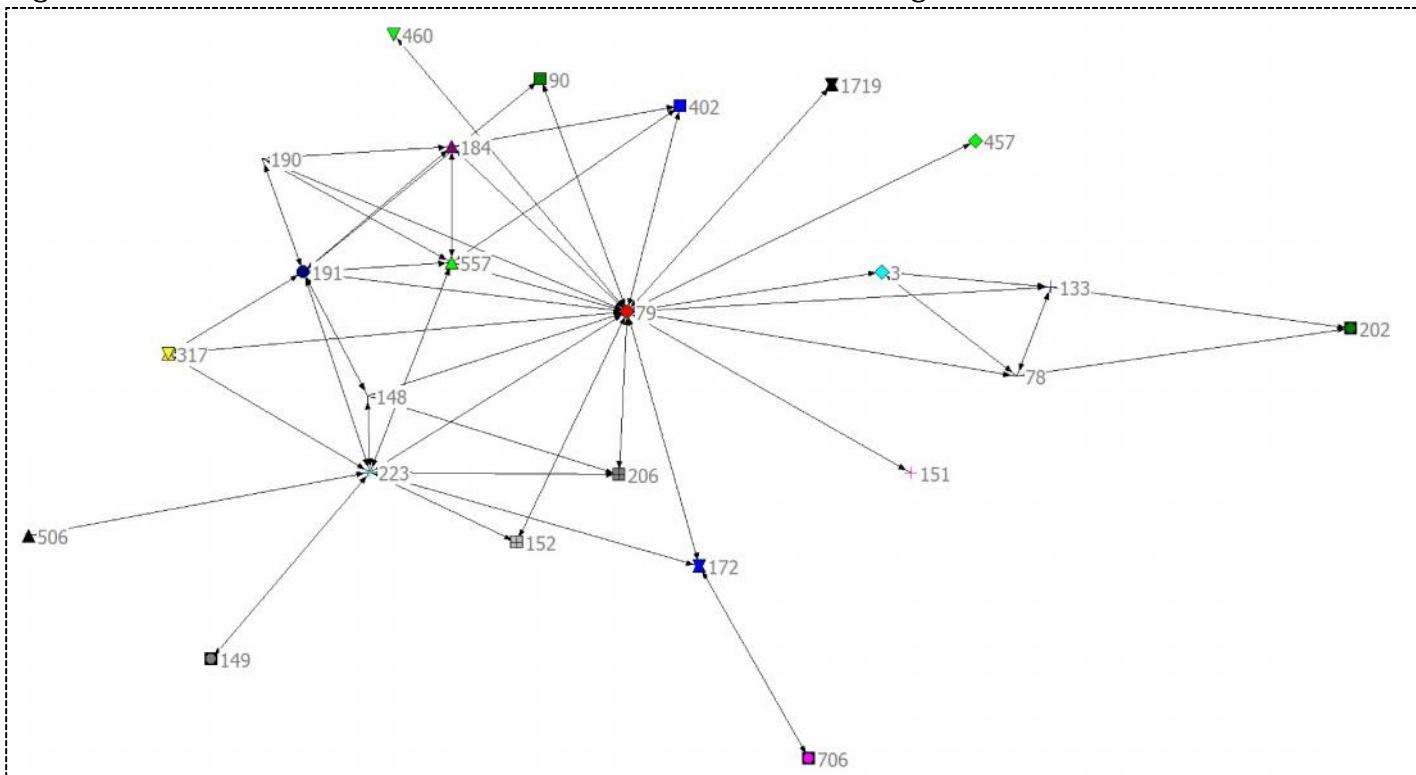


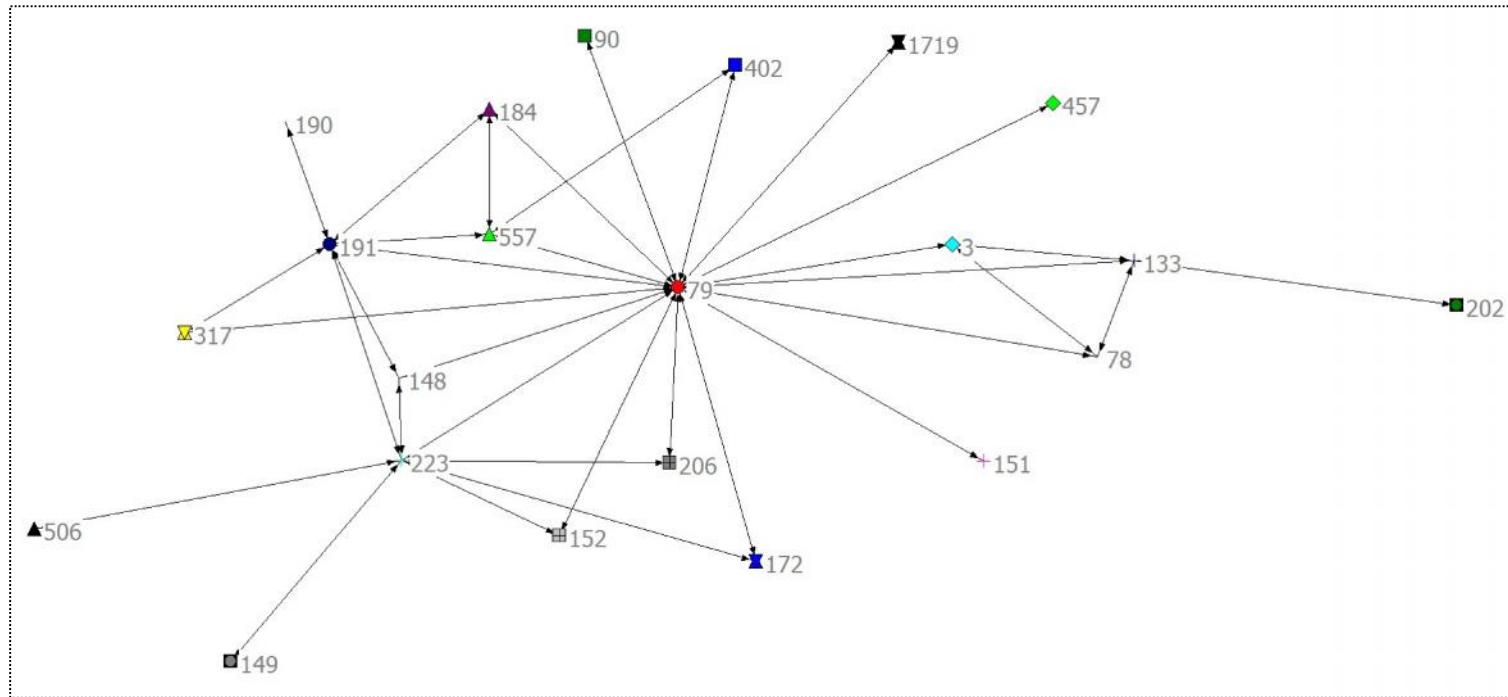
Figure 5.34. Netdraw, David I: more than 5 co-witnessing acts



The following list gives the names of some of the additional actors who witnessed more than five times.

- [78] Walter de Bidun, king's chancellor (d. 1178) from 1147×51
- [133] Nicholas of Roxburgh (d. 1171) [royal clerk under King David; later chamberlain and chancellor]
- [149] Gregory, bishop of Dunkeld (d. 1169)
- [151] Walter Ryedale (d. 1156)
- [172] Ranulf Soulis, king's butler (d. 1165×72)
- [402] Gervase Ridel, sheriff of Roxburgh
- [460] William Comyn, chancellor (d. ca 1160) [chancellor from ca 1136 to ca 1141]
- [457] Geoffrey, abbot of Dunfermline (1128-54)
- [506] Edward son of Siward, the constable

Figure 5.35. Netdraw, David I: more than 6 co-witnessing acts



At the level of more than 6 co-witnessing acts, Hugh de Moreville is linked to 17 other individuals, even though there are only 21 people in the sociogram. At the level of more than 7 acts, Hugh de Moreville is attached to 14 others, all but one of the other actors. At the level of more than 9 co-witnessing acts, he is linked to all 8 of the other actors.

Figure 5.36. Netdraw, David I: more than 7 co-witnessing acts

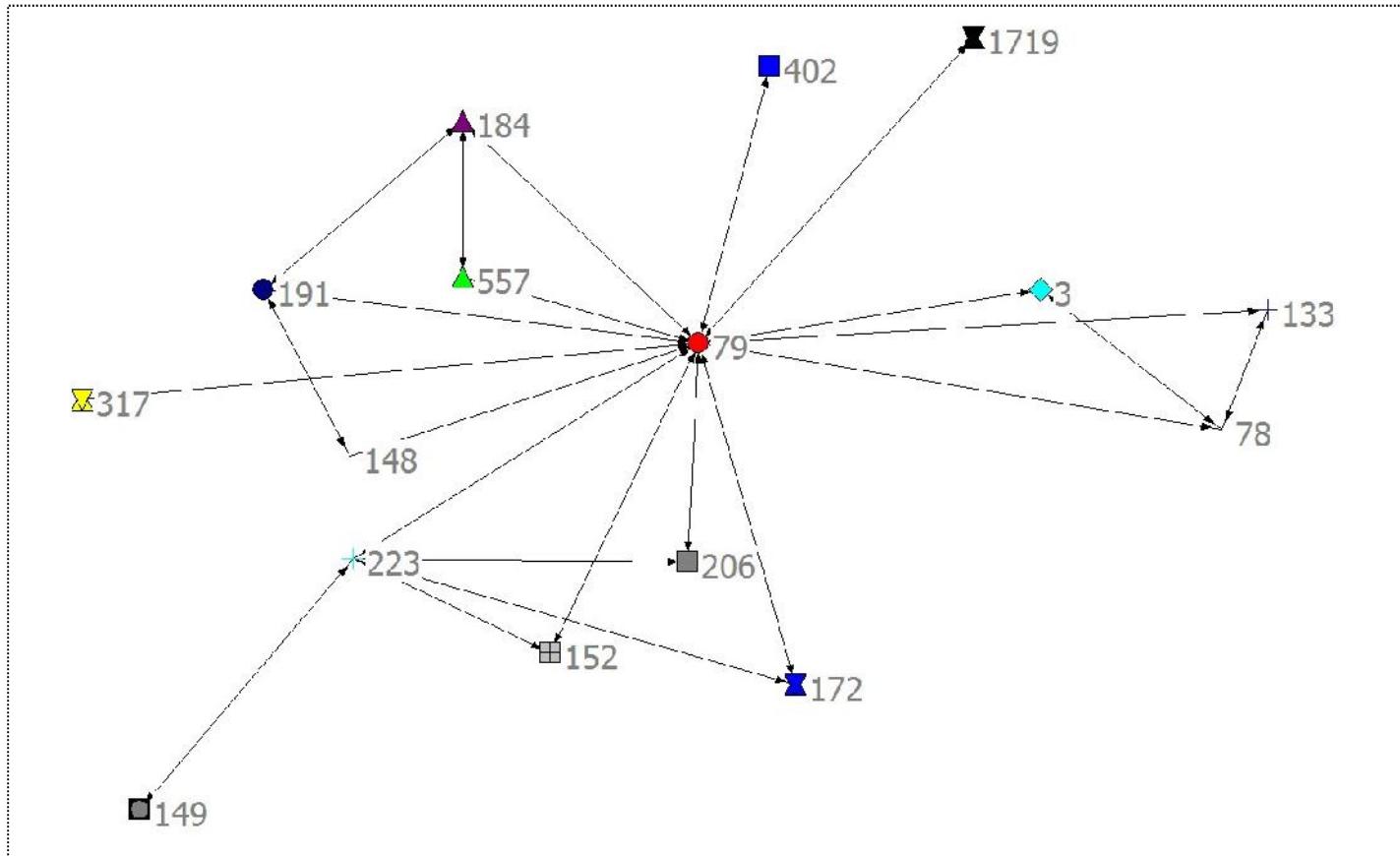


Figure 5.37. Netdraw, David I: more than 8 co-witnessing acts

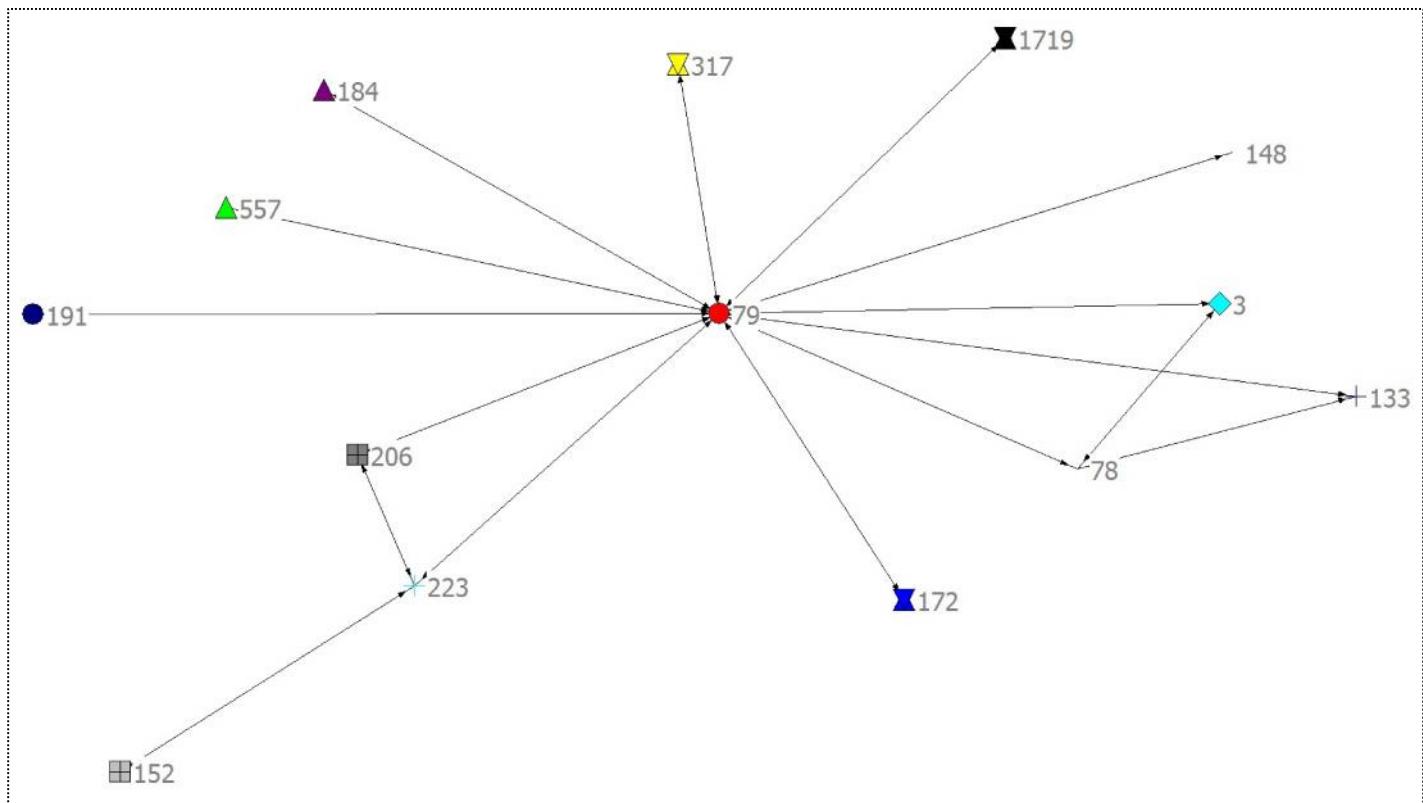


Figure 5.38. Netdraw, David I: more than 9 co-witnessing acts

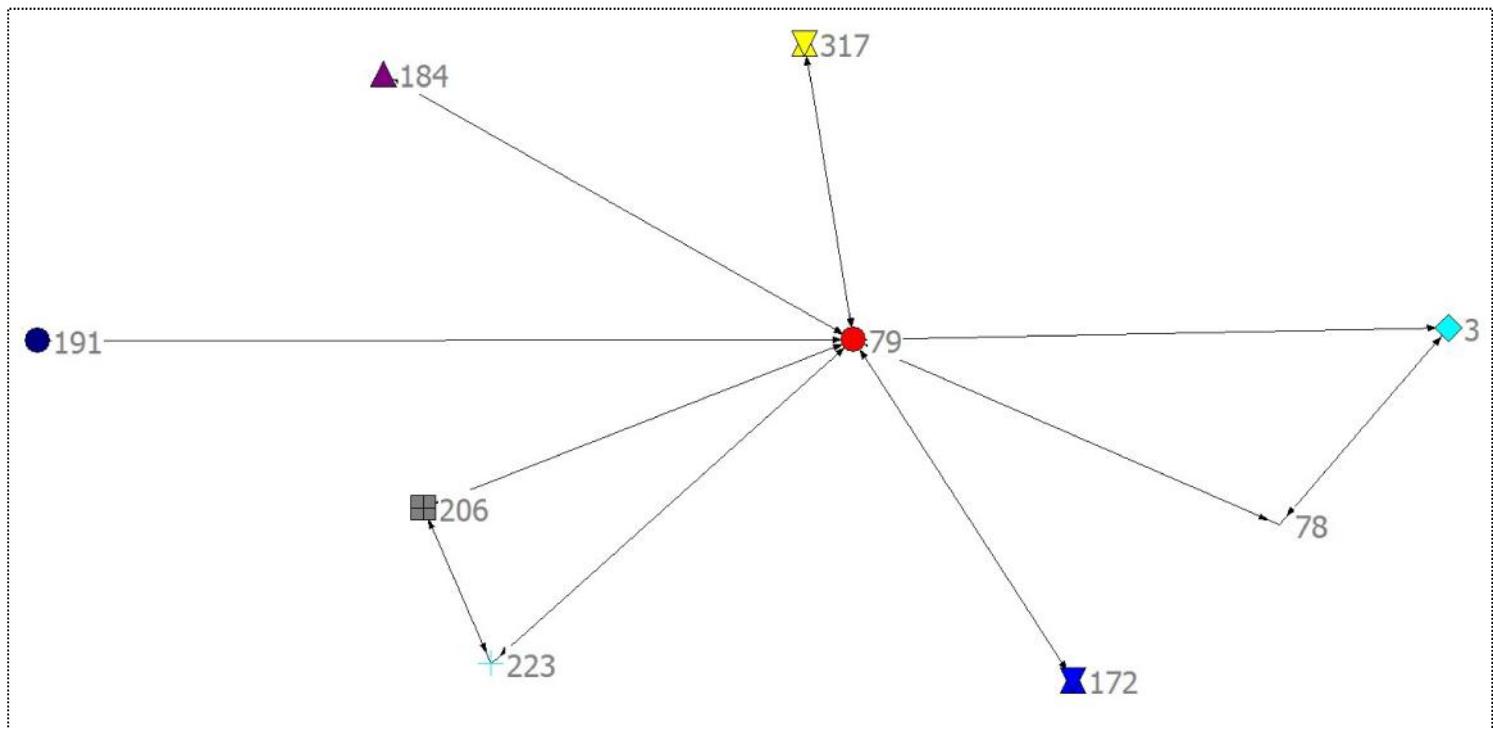


Figure 5.39. Netdraw, David I: more than 10 co-witnessing acts

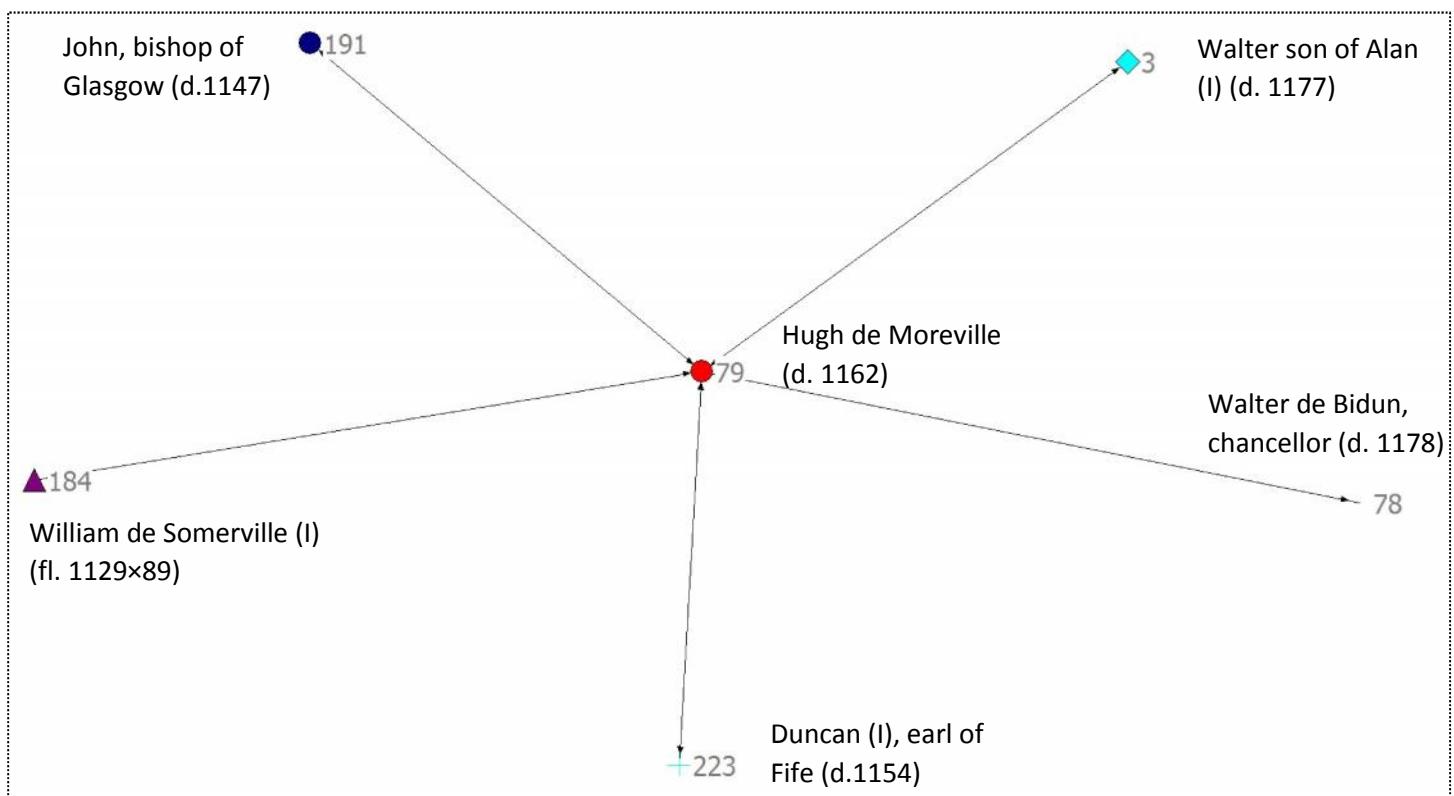


Figure 5.40. Gephi, David I: more than 10 witnessing acts

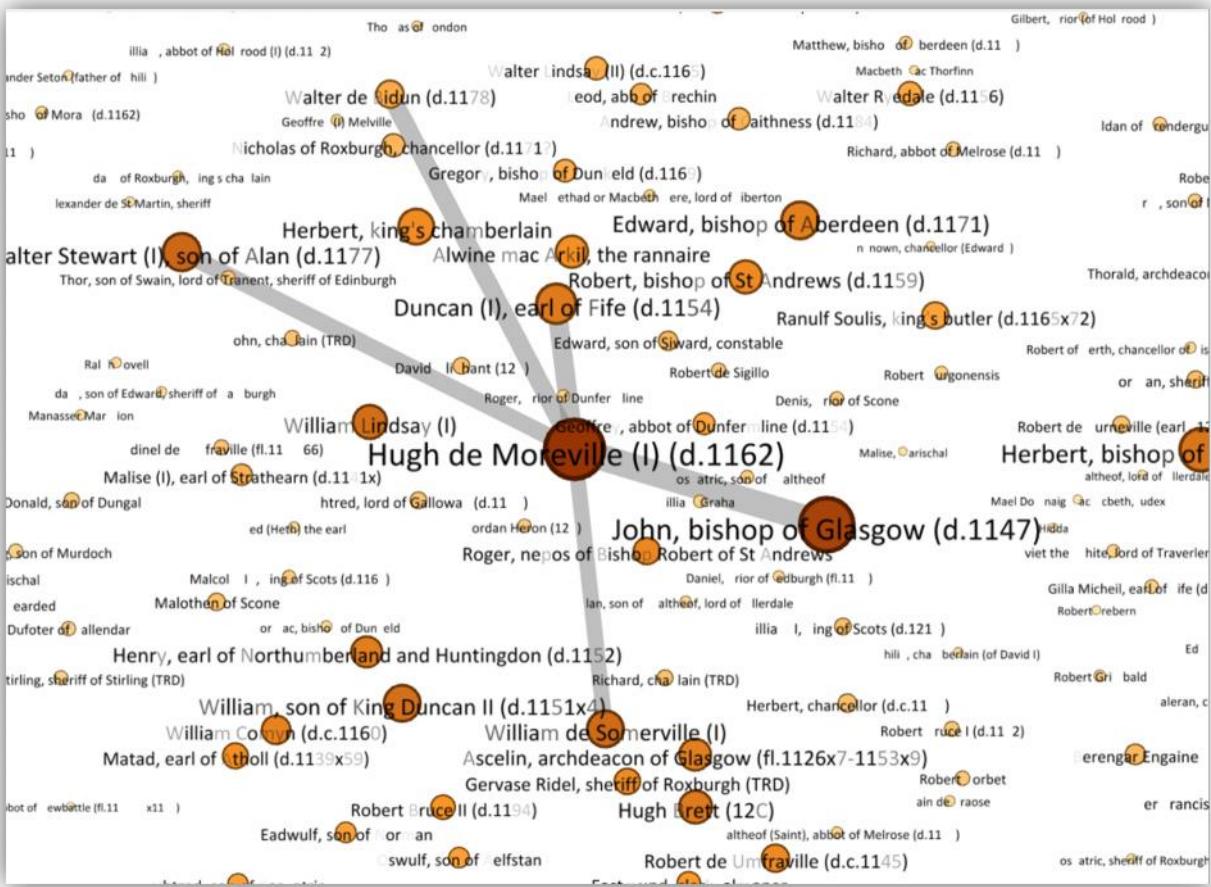


Figure 5.41. Netdraw, David I: more than 12 co-witnessing acts

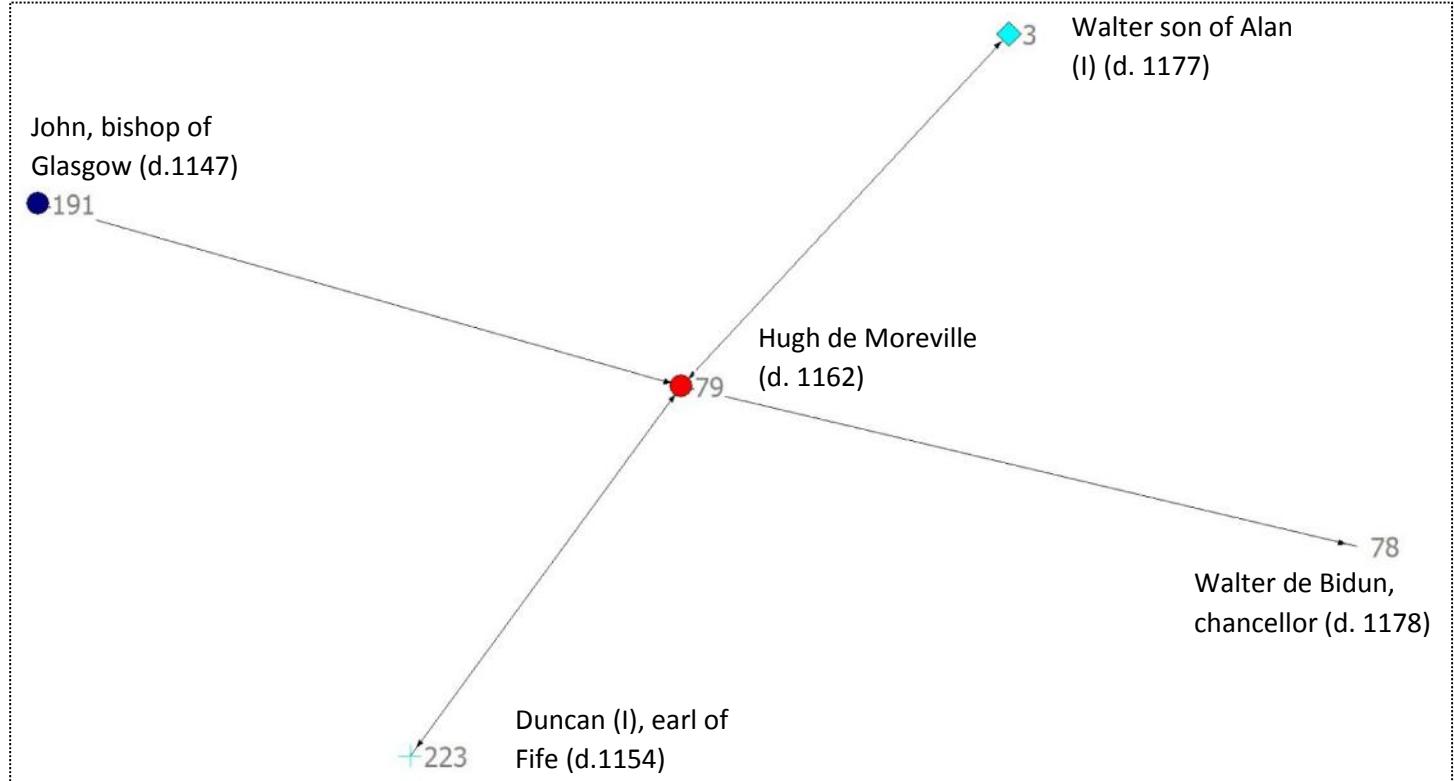


Figure 5.42. Netdraw, David I: more than 13 co-witnessing acts

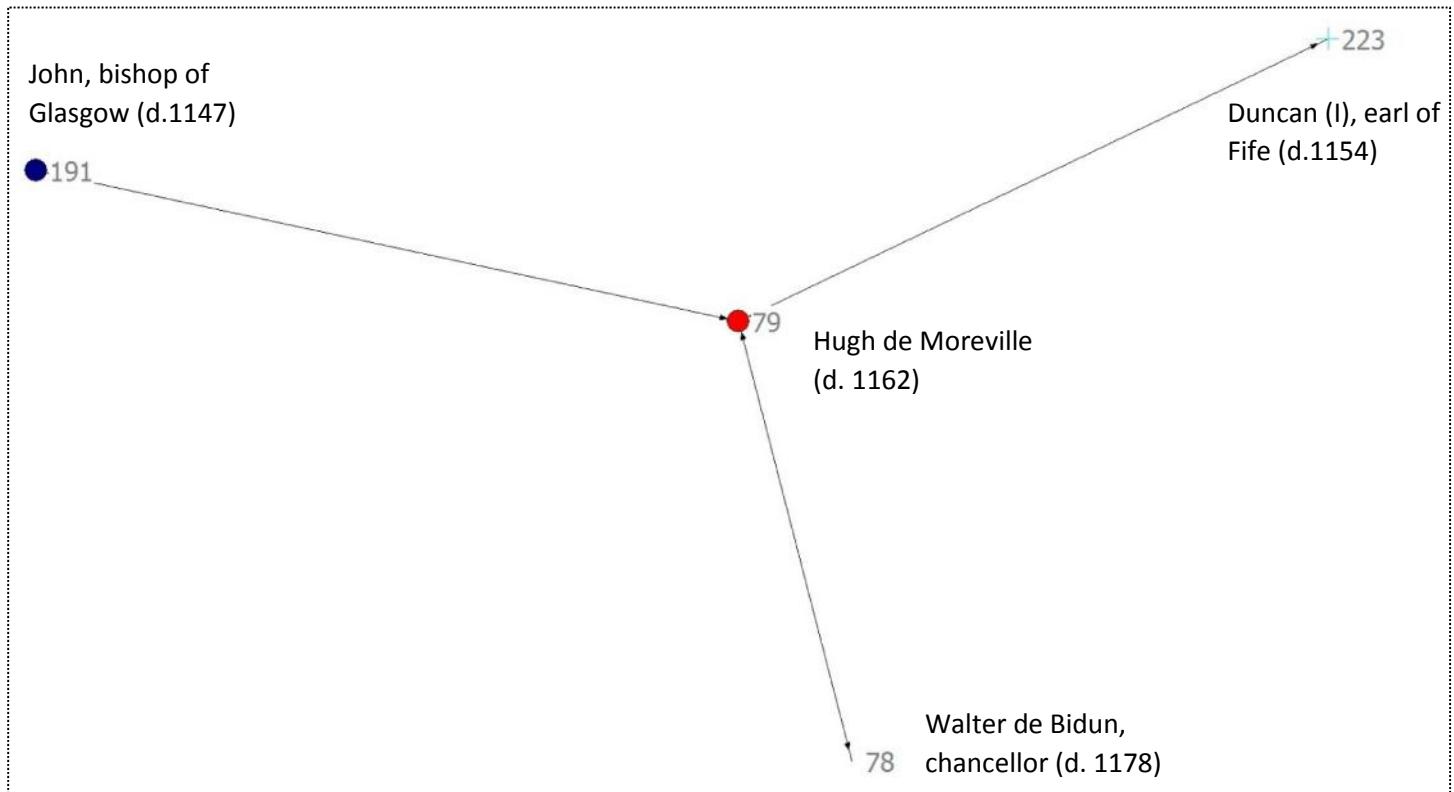


Figure 5.43. Netdraw, David I: more than 14 co-witnessing acts

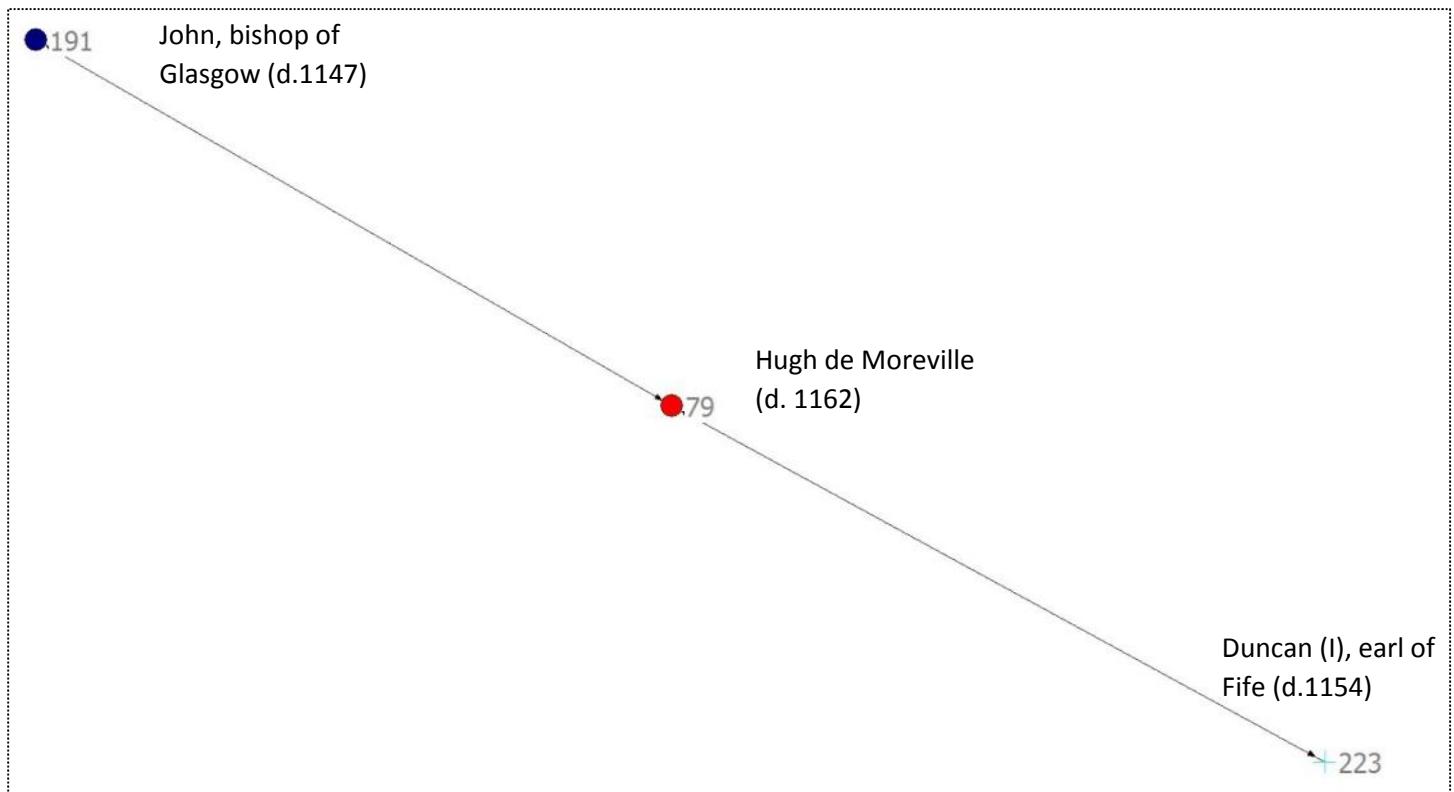


Figure 5.44. Netdraw, David I: more than 15 co-witnessing acts

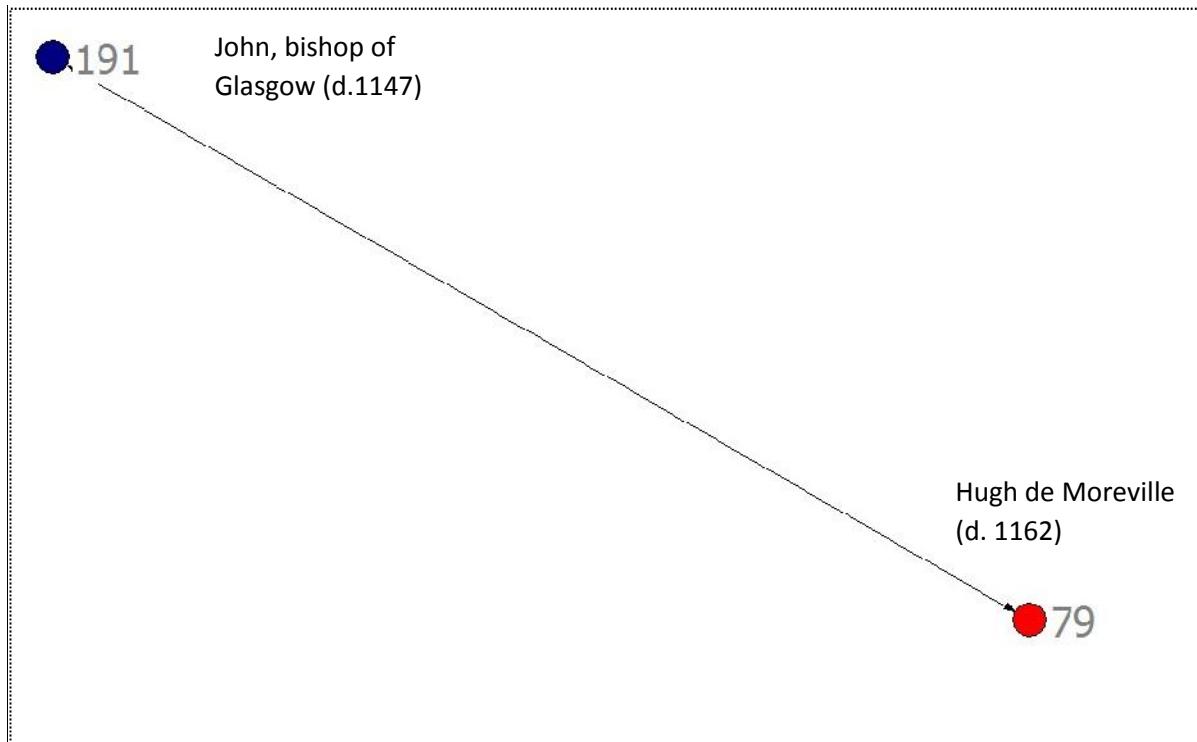
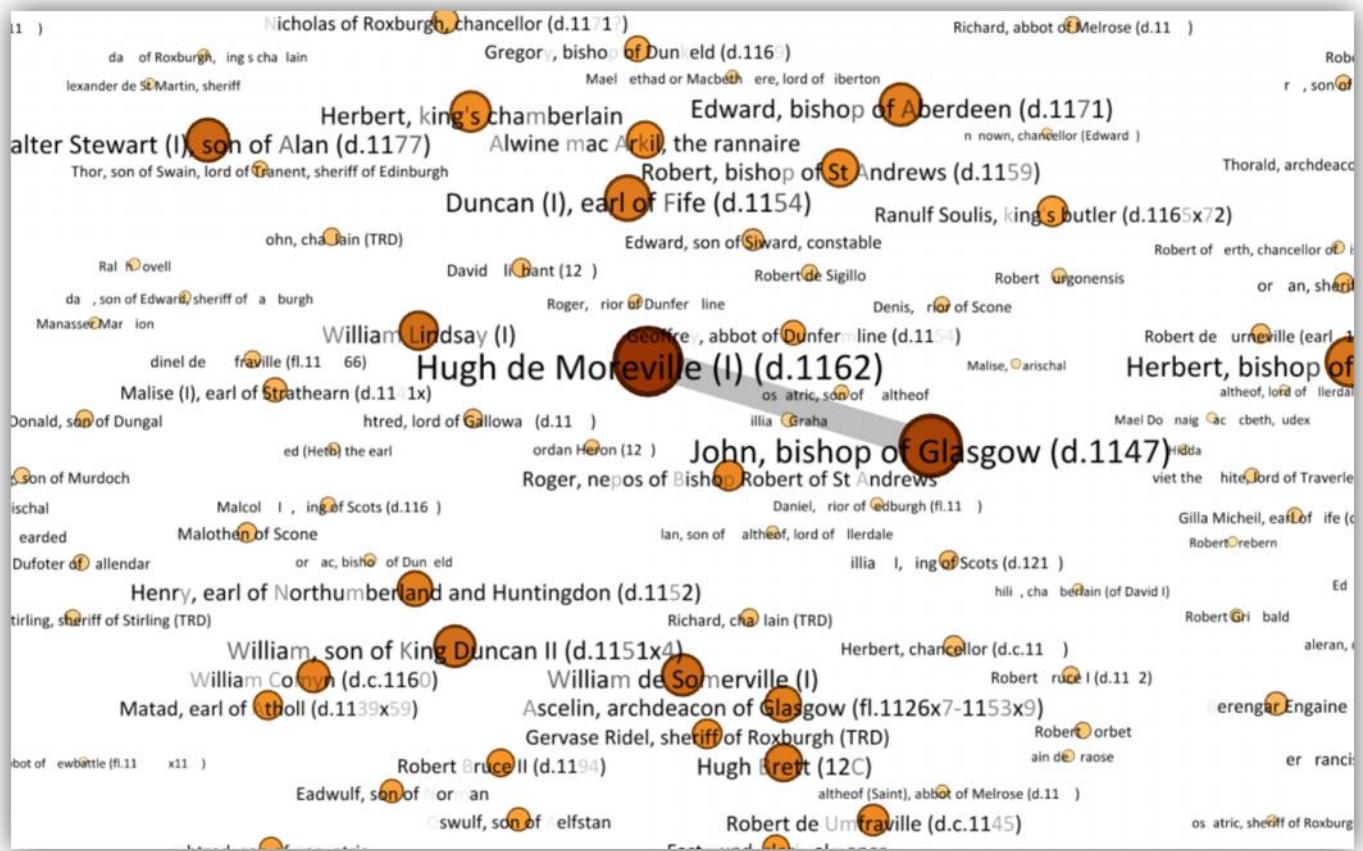


Figure 5.45. Gephi, David I: more than 15 co-witnessing acts



It is also worth noting that the top 15 most central individuals by degree favours those with the most longevity through the 29-year reign. Thus, [78] Walter de Bidun, chancellor at the very end of David's reign, who witnessed alongside Hugh de Moreville 14 times, only comes in at a ranking of 17 by degree. [460] William Comyn (d. ca 1160), another sometime chancellor, was ranked at number 16 by degree. One of the useful things about eigenvector centrality is that it helps control for the extent to which simple degree analysis can favour longevity. Table 5.10 lists the top 15 by eigenvector (as a percentage of Hugh de Moreville's eigenvector) and shows the change as compared to the degree list.

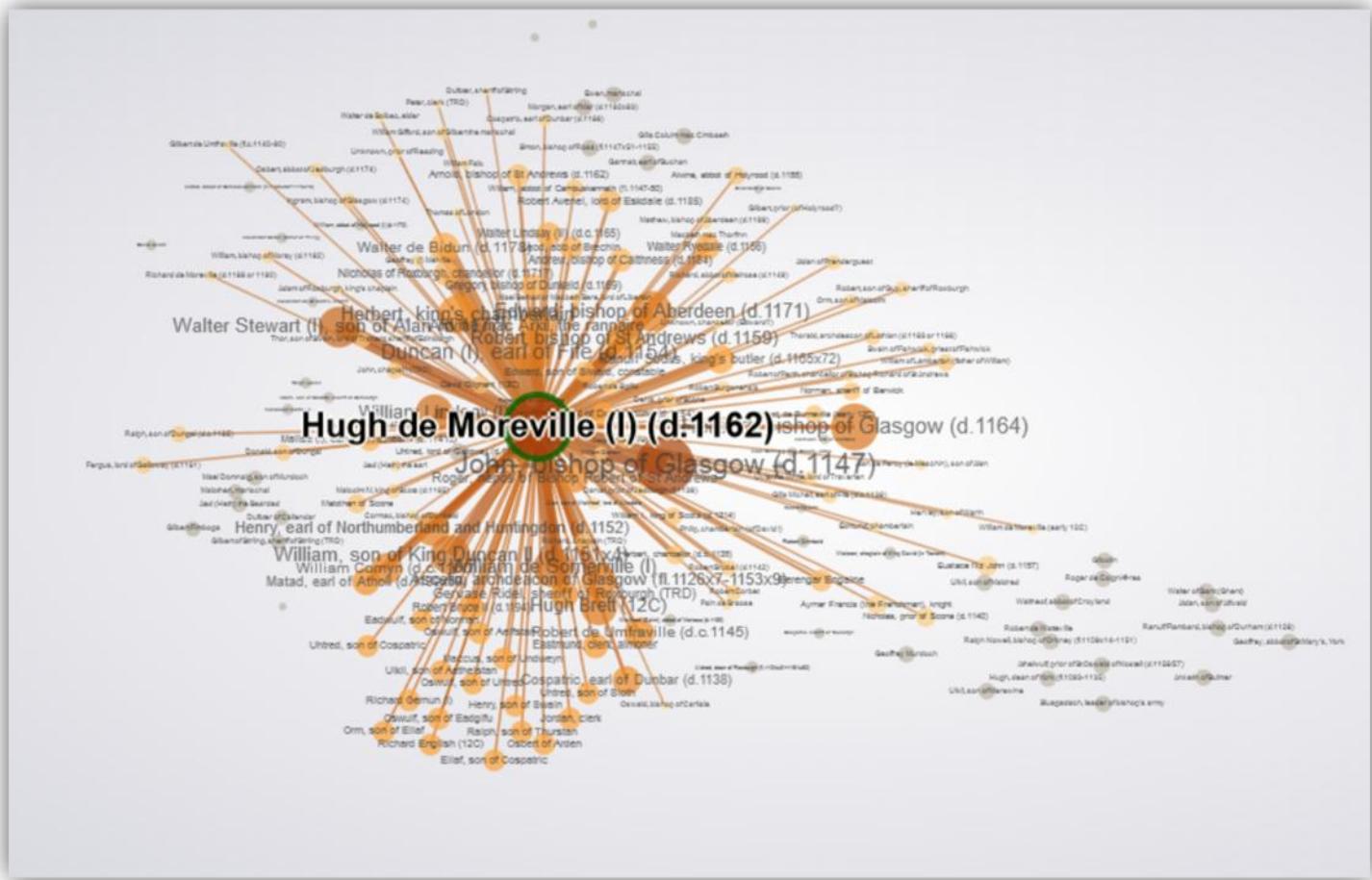
Table 5.14. Comparison of centrality by eigenvector versus degree

Rank	ID	Name	Eigenvector	Degree	Difference
1	79	Hugh de Moreville (I) (d.1162)	100%	124	Same
2	191	John, bishop of Glasgow (d.1147)	92.6%	111	Same
3	3	Walter Stewart (I), son of Alan (d.1177)	74.3%	73	↑5 <sup>th</sup> to 3 <sup>rd</sup>
4	184	William de Somerville (I)	72.5%	70	↑7 <sup>th</sup> to 4 <sup>th</sup>
5	1719	William Lindsay (I)	71.1%	64	↑9 <sup>th</sup> to 5 <sup>th</sup>
6	557	William, son of King Duncan II (d.1151x4)	70.7%	70	↑7 <sup>th</sup> to 6 <sup>th</sup>
7	140	Herbert, bishop of Glasgow (d.1164)	67.7%	86	↓3 <sup>rd</sup> to 7 <sup>th</sup>
8	565	Hugh Brett (12C)	65.4%	62	↑10 <sup>th</sup> to 8 <sup>th</sup>
9	223	Duncan (I), earl of Fife (d.1154)	64.9%	78	↓4 <sup>th</sup> to 9 <sup>th</sup>
10	90	Henry, earl of Northumberland and Huntingdon (d.1152)	63.1%	57	↑13 <sup>th</sup> to 10 <sup>th</sup>
11	317	Edward, bishop of Aberdeen (d.1171)	62.9%	72	↓6 <sup>th</sup> to 11 <sup>th</sup>
12	190	Ascelin, archdeacon of Glasgow (fl.1126x7-1153x9)	62.6%	59	Same
13	460	William Comyn (d.c.1160)	61.5%	52	↑ 14 <sup>th</sup> to 13 <sup>th</sup>
14	707	Roger, <i>nepos</i> of Bishop Robert of St Andrews	58.6%	47	↑ 16 <sup>th</sup> to 14 <sup>th</sup>
15	313	Robert de Umfraville (d.c.1145)	57.3%	49	same

With the notable exception of Bishop John of Glasgow, most clerics lost status in the shift from degree to eigenvector. Herbert, abbot of Kelso and bishop of Glasgow, fell four places from 3<sup>rd</sup> to 7<sup>th</sup>, Edward, chancellor and bishop of Aberdeen, fell five places from 6<sup>th</sup> to 11<sup>th</sup>. Robert, bishop of St Andrews, fell from joint tenth place in degree to 18<sup>th</sup> place in eigenvector, even lower than his own *nepos*, Roger (a knight). The position of other knights improved as well, including William de Somerville, William Lindsay (I), Hugh Brett, and Robert de Umfraville. This calculation may give a better sense of the real power dynamics at play. Interestingly the positions of Earl Duncan of Fife and Alwine mac Arkill fell significantly, five places for the former and ten places for Alwine. In addition to putting laymen in a

more powerful light, the eigenvector calculation does lessen the importance of longevity. The clearest example of this is the improved position of the steward Walter fitz Alan, who is now clearly in the number three position after Hugh and Bishop John. Sometime chancellor William Comyn has also risen in the world, charting at number 13 in the eigenvector league tables, but somewhat surprisingly, another sometime chancellor, [78] Walter de Bidun, one of the most prolific witnesses in the network, has an unimpressive eigenvector score of 39.5%, at number 43, down from joint fifteenth in degree.

Figure 5.46. Co-witnessing links of Hugh de Moreville (d. 1162).



The remarkably pre-eminent position of Hugh de Moreville in David's household is well illustrated by Figure 5.46, a Gephi sociogram highlighting all the individuals with whom Hugh co-witnessed. Relatively few witnesses to David's charters did not appear with Hugh at least once. Hugh has a clear advantage in terms of degree, betweenness, and eigenvector centrality. Table 5.11, showing pairs who witnessed together ten or more times, further demonstrates Hugh's unique position. Of these ten most productive

witnessing 'relationships', Hugh is involved in eight of them. Another way of looking at it is that of the 281 cliques including David I witnesses, no fewer than 255 (90.7%) include Hugh.

Table 5. 15. Pairs who witnessed together 10 or more times

Rank	Person 1	Person 2	Docs witnessed
1	Hugh de Moreville (I) (d.1162)	John, bishop of Glasgow (d. 1147)	20
2	Hugh de Moreville (I) (d.1162)	Duncan (I), earl of Fife (d. 1154)	15
3	Hugh de Moreville (I) (d.1162)	Walter de Bidun (d. 1178)	14
4	Hugh de Moreville (I) (d.1162)	Walter Stewart (II), son of Alan (d.1177)	13
5	Hugh de Moreville (I) (d.1162)	William de Somerville (I)	12
6	Hugh de Moreville (I) (d.1162)	Alwine mac Arkil, the <i>rannaire</i>	10
6	Hugh de Moreville (I) (d.1162)	Edward, bishop of Aberdeen (d. 1171)	10
6	Hugh de Moreville (I) (d.1162)	Ranulf Soulis, king's butler (d. 1165×71)	10
6	Alwine mac Arkil, the <i>rannaire</i>	Duncan (I), earl of Fife (d. 1154)	10
6	Walter de Bidun (d. 1178)	Walter Stewart (II), son of Alan (d.1177)	10

One final point: Hugh de Moreville and Walter fitz Alan are well known as the recipients of royal munificence in terms of large blocks of territory – Lauderdale, Cunningham, Strathgryfe, Kyle Stewart – but what about those other recipients of such lordships? Ranulf Soulis (d. 1165×72) witnessed David's charters beginning in the 1120s, was king's butler by the end of the reign, and received Liddesdale on what would become the border with England. Ranulf had a degree of 47 and an eigenvector score of 44%. What about Robert Avenel, lord of Eskdale? Like Walter fitz Alan, he was of the younger generation and would rise to prominence as a royal justice under Malcolm IV. In David's charters, however, he had a degree of 34 and an eigenvector of only 34%. Most famously of all, what about Robert de Brus, recipient of the wealthy lordship of Annandale? Robert Bruce (I), who had Annandale by 1124 and died in 1142, only had a degree of 19 and an eigenvector of 23%, while his son Robert Bruce (II) (d. 1194) had a degree of 41 and an eigenvector of 52%. These men seem to have been less central to David's household than Walter fitz Alan and especially Hugh de Moreville. Further, they were less important than men like Cospatric, brother of Dolfin, first earl of Dunbar (d. 1138) (46/ 57%) and Matad, mormaer or 'earl' of Atholl (d. 1139×59) (44/ 55%).

## MALCOLM IV (1153-1165)

The study of the witnesses to the documents of King Malcolm included 88 documents, all of them charters proper. This is out of a potential 99 documents: there were 11 charters with no witnesses. All of the co-witnessing studies use the dataset as of October 2014. There were 157 witnesses in the study with 5488 ties. Two of the witnesses were women. These were the king's mother, Countess Ada de Warenne (d. 1178), and the wife of Earl Duncan (II) of Fife, Countess Ela.

Table 5.16. Top 15 witnesses to Malcolm IV charters by degree

Name	PoMS ID	Degree	Betweeness	Eigenvector
Walter Stewart (I), son of Alan (d.1177)	3	119	991.613	0.975129
Richard de Moreville (d.1189 or 1190)	112	118	683.956	1
Osbert, abbot of Jedburgh (d.1174)	107	115	580.266	0.989017
Nicholas of Roxburgh, chancellor (d.1171?)	133	108	884.172	0.891966
Ingram, bishop of Glasgow (d.1174)	143	102	519.936	0.909038
Walter de Bidun (d.1178)	78	97	466.591	0.857967
William I, king of Scots (d.1214)	1	94	285.571	0.87074
Matthew, bishop of Aberdeen (d.1199)	2	94	429.911	0.857767
Cospatric, earl of Dunbar (d.1166)	124	93	313.479	0.878653
Duncan (II), earl of Fife (d.1204)	13	90	403.463	0.840057
David Oliphant (12C)	83	86	229.289	0.834438
Alured, abbot of Cambuskenneth (fl.1152x78)	106	85	267.755	0.817994
Arnold, bishop of St Andrews (d.1162)	85	81	250.453	0.765019
Richard, bishop of St Andrews (d.1178)	134	79	174.195	0.802174
Gilla Brigte, earl of Angus (d.x1189)	110	77	193.821	0.746183

The top five people by degree and eigenvector centrality are the same, just reordered slightly. There is less difference between the two measures in Malcolm's reign than in David's, perhaps because Malcolm's reign was 11 ½ years compared to 29 for David. In the Eigenvector listing, [3] Walter son of Alan moves down from first to third, while [112] Richard de Moreville and [107] Abbot Osbert shift up one place, and Bishop Ingram and Nicholas of Roxburgh switch places.

Table 5.17. Comparison of centrality by eigenvector versus degree

Rank	ID	Name	Eigenvector	Degree	Difference
1	112	Richard de Moreville (d.1189 or 1190)	1	118	↑2 <sup>nd</sup> to 1 <sup>st</sup>
2	107	Osbert, abbot of Jedburgh (d.1174)	0.989017	115	↑3 <sup>rd</sup> to 2 <sup>nd</sup>
3	3	Walter Stewart (I), son of Alan (d.1177)	0.975129	119	↓1 <sup>st</sup> to 3 <sup>rd</sup>
4	143	Ingram, bishop of Glasgow (d.1174)	0.909038	102	↑5 <sup>th</sup> to 4 <sup>th</sup>
5	133	Nicholas of Roxburgh, chancellor (d.1171?)	0.891966	108	↓4 <sup>th</sup> to 5 <sup>th</sup>
6	124	Cospatric, earl of Dunbar (d.1166)	0.878653	93	↑8 <sup>th</sup> to 6 <sup>th</sup>
7	1	William I, king of Scots (d.1214)	0.87074	94	Same
8	78	Walter de Bidun, chancellor (d.1178)	0.857967	97	↓6 <sup>th</sup> to 8 <sup>th</sup>
9	2	Matthew, bishop of Aberdeen (d.1199)	0.857767	94	↓joint 7 <sup>th</sup> to 9 <sup>th</sup>
10	13	Duncan (II), earl of Fife (d.1204)	0.840057	90	↓9 <sup>th</sup> to 10 <sup>th</sup>
11	83	David Oliphant (12C)	0.834438	86	↓10 <sup>th</sup> to 11 <sup>th</sup>
12	106	Alured, abbot of Cambuskenneth (fl.1152×53 – 1172×78)	0.817994	85	↓11 <sup>th</sup> to 12 <sup>th</sup>
13	134	Richard, bishop of St Andrews (d.1178)	0.802174	79	Same
14	140	Herbert, bishop of Glasgow (d.1164)	0.785769	77	Same
15	144	Gilbert de Umfraville (fl.c.1140-90)	0.781287	75	↑ joint 16 <sup>th</sup> to 15 <sup>th</sup>

Whereas [79] Hugh de Moreville dominated the witnesses of David I, that position seems to be split among the witnesses of Malcolm IV. Hugh's son [112] Richard de Moreville, who took over as constable, has the highest eigenvector centrality, but [3] Walter son of Alan, the steward, has the highest degree. On both these counts, the two men were very close: Walter's degree was only one higher than Richard's – 119 to 118, while Walter's eigenvector was 97.5% that of Richard. What seems to give Walter the edge was his remarkably high betweenness centrality, 991.6 compared to Richard's 684. This explains why Walter appears so central in the sociograms that follow. This is potentially related to the fact that Walter witnessed nearly twice as many of the king's documents as Richard (48 to 25).

The most central churchman in this reign was [107] Osbert, abbot of Jedburgh. As with Bishop John, it was his role as close advisor to the king, rather than his institutional position, which seems to have given him this prominence. Malcolm raised Osbert from a prior to an abbot early in his reign, gave the church of Restenneth near Forfar to Jedburgh as a daughter cell, and was himself buried at Jedburgh abbey, all signs of personal favour.

As with David's reign, the top actors were a mix of family, household officers, and other advisors. This is reflection that closeness to the king was determined by a combination of institutional factors and personal factors, like friendship, loyalty, and trust. Malcolm's reign is marked by an increased influence of churchmen. This is reflected partially in the fact that while five of King David's top 15 players (by degree) were clerics, the corresponding number for King Malcolm is 9. They are placed in italics below. As with David, chancellors and chamberlains figure prominently, with [133] Nicholas of Roxburgh holding both positions, and much of [143] Ingram's position owing to his being chancellor rather than archdeacon of Glasgow or bishop of Glasgow. With [78] Walter de Bidun (d. 1178) also acting as chancellor for much of Malcolm's reign, it is noteworthy that numbers 4, 5, and 6 according to degree were all chancellor at some point. Unlike his grandfather's household, Malcolm's most frequent witnesses did not seem to include non-office-holding knights, with the possible exception of David Olifard, who was a royal justice by the beginning of William's reign. What we do get with Malcolm is his brother William [1], the abbots of Cambuskenneth [106] and Kelso [85], his chaplain [134], and the earls of Dunbar [124], Fife [13], and Angus [110].

Table 5.18. Top players and their positions (churchmen in italics)

Name	PoMS ID	Position
Walter Stewart (I), son of Alan (d.1177)	3	King's steward (by 1153)
Richard de Moreville (d.1189 or 1190)	112	King's constable (officially 1162×)
<i>Osbert, abbot of Jedburgh (d.1174)</i>	107	Prior from 1140s, abbot ×1156
<i>Nicholas of Roxburgh, chancellor (d.1171?)</i>	133	Chamberlain 1159-64 Chancellor 1164-71
<i>Ingram, bishop of Glasgow (d.1174)</i>	143	Archdeacon of Glasgow 1162-64 Chancellor 1161-2 Bishop of Glasgow 1164-74
<i>Walter de Bidun (d.1178)</i>	78	Chancellor ×1151 – ca 1161 Chancellor ca 1171 - 1178
William I, king of Scots (d.1214)	1	Brother of the king
<i>Matthew, bishop of Aberdeen (d.1199)</i>	2	Archdeacon of St Andrews, ca 1150 – 1172 Bishop of Aberdeen, 1172-99
Cospatric, earl of Dunbar (d.1166)	124	Earl of Dunbar
Duncan (II), earl of Fife (d.1204)	13	Earl of Fife (note minority 1154-59)
David Oliphant (12C)	83	Royal justice 1165×71
<i>Alured, abbot of Cambuskenneth (fl.1152×78)</i>	106	Abbot of Cambuskenneth
<i>Arnold, bishop of St Andrews (d.1162)</i>	85	Abbot of Kelso, 1147-1160 Bishop of St Andrews, 1160-62
<i>Richard, bishop of St Andrews (d.1178)</i>	134	King's chaplain Elected to bishopric 1163
Gilla Brigte, earl of Angus (d.×1189)	110	Earl of Angus

The following series of sociograms reveals the key relationships between top players in Malcolm IV's reign. These are easily compared to the corresponding sociograms from David I's reign, because the parameters are so similar. While David's network had 83 documents and 172 witnesses, Malcolm's had 88 documents and 157 witnesses. Despite having fewer witnesses, they were more interconnected than the witnesses to David's charters, as evidenced by the fact that Malcolm's network had 2744 edges to 2100 in David's network. This is also why David's graph had a density of 0.143 as compared to the density of 0.224 in Malcolm's graph. More of the potential connections between individuals have been realised in the reign of Malcolm IV. While there is no single person with the overarching role played by Hugh de Moreville in the reign of David I, the triumvirate of Walter Stewart, Richard de Moreville, and Abbot Osbert seem to collectively function as the equivalent of Hugh with Bishop John of Glasgow among the witnesses of David I. Figure 5.50, showing connections at the level of more than 4 co-witnessing acts, illustrates how pivotal were these three key individuals among the broader network.

Figure 5.47. Gephi: witnesses to charters of King Malcolm IV

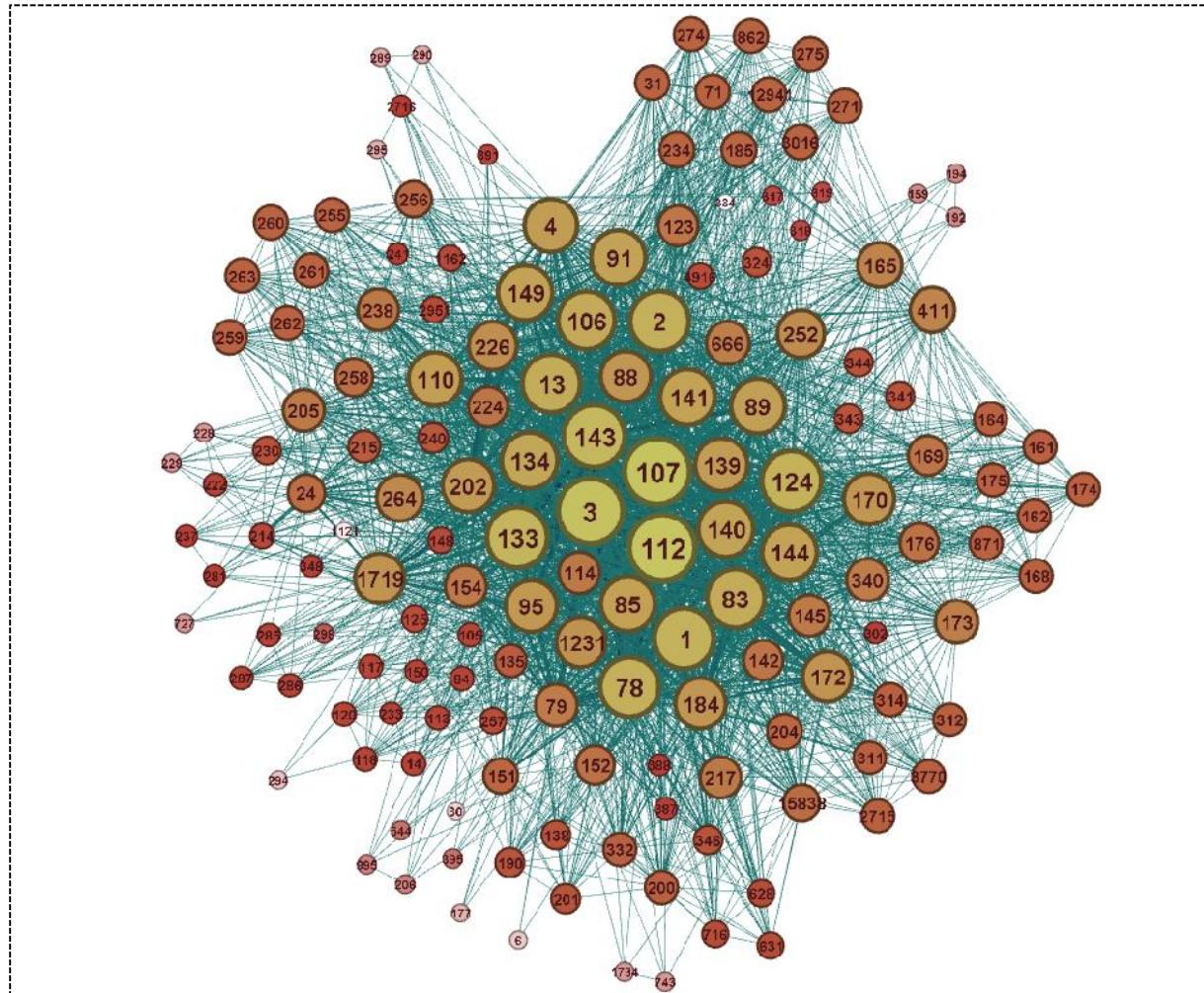


Figure 5.48. Gephi: labelled sociogram of Malcolm IV charter witnesses

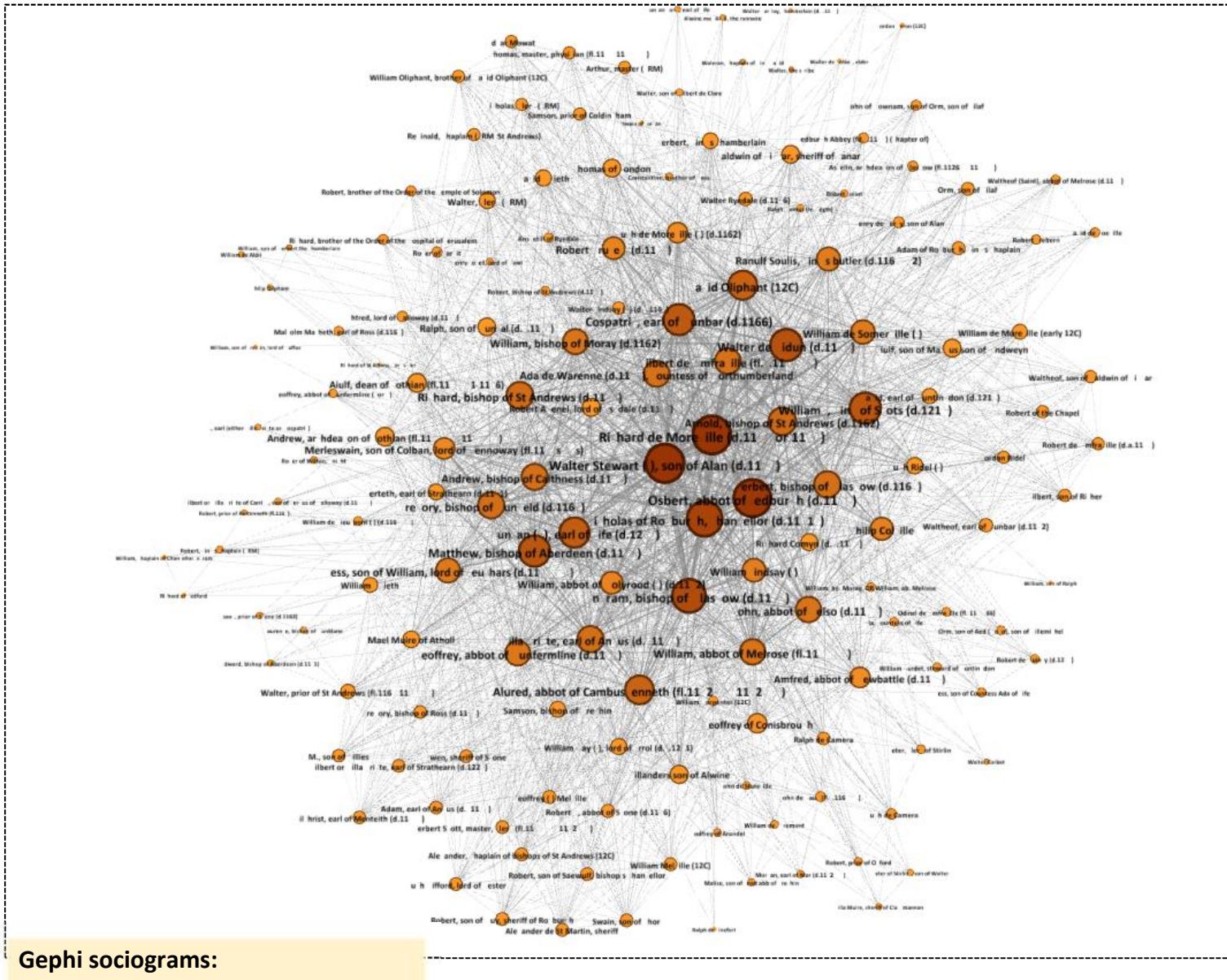


Figure 5.49. Netdraw: witnesses to charters of Malcolm IV

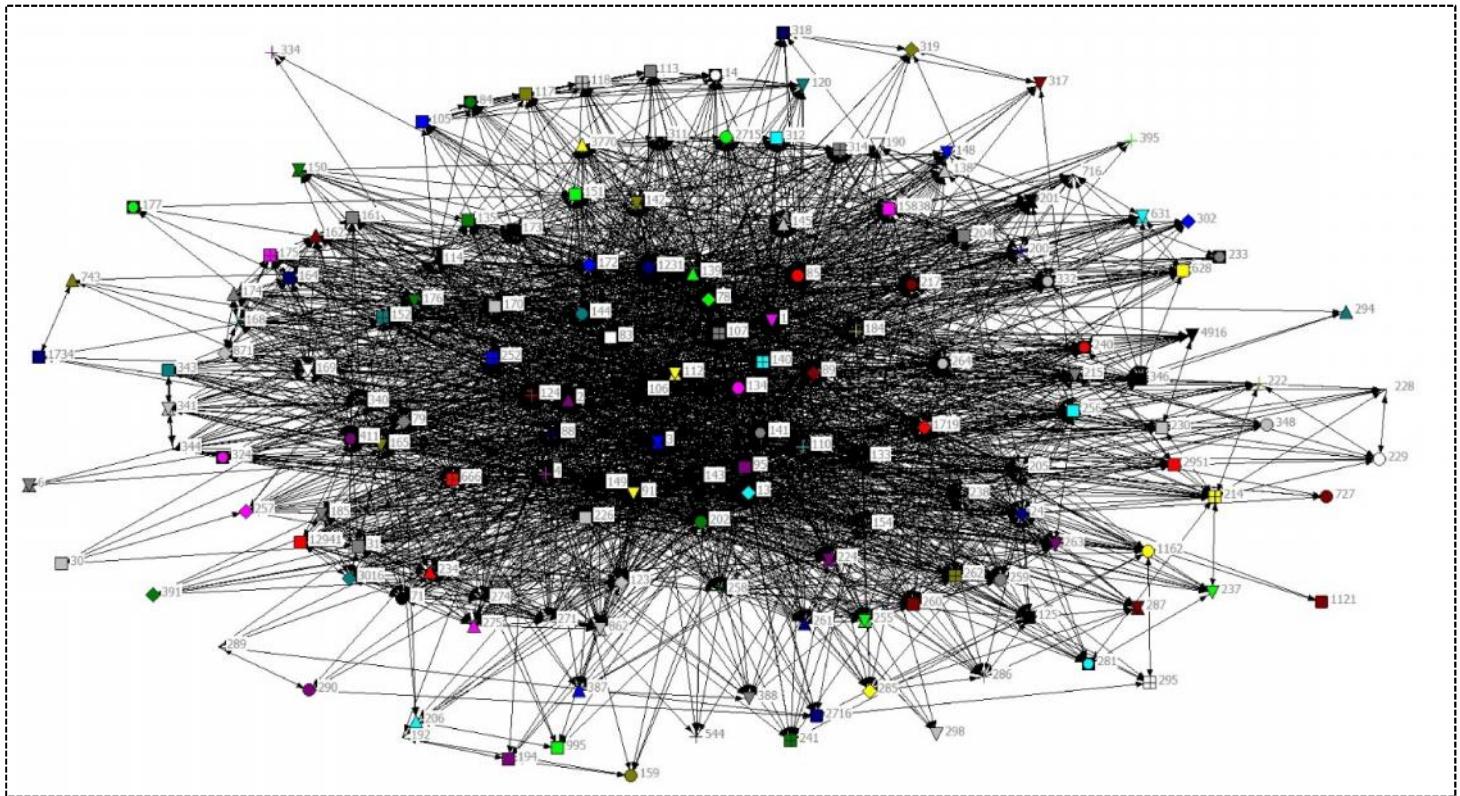


Figure 5.50. Netdraw: Malcolm IV witnesses, more than 4 co-witnessing acts

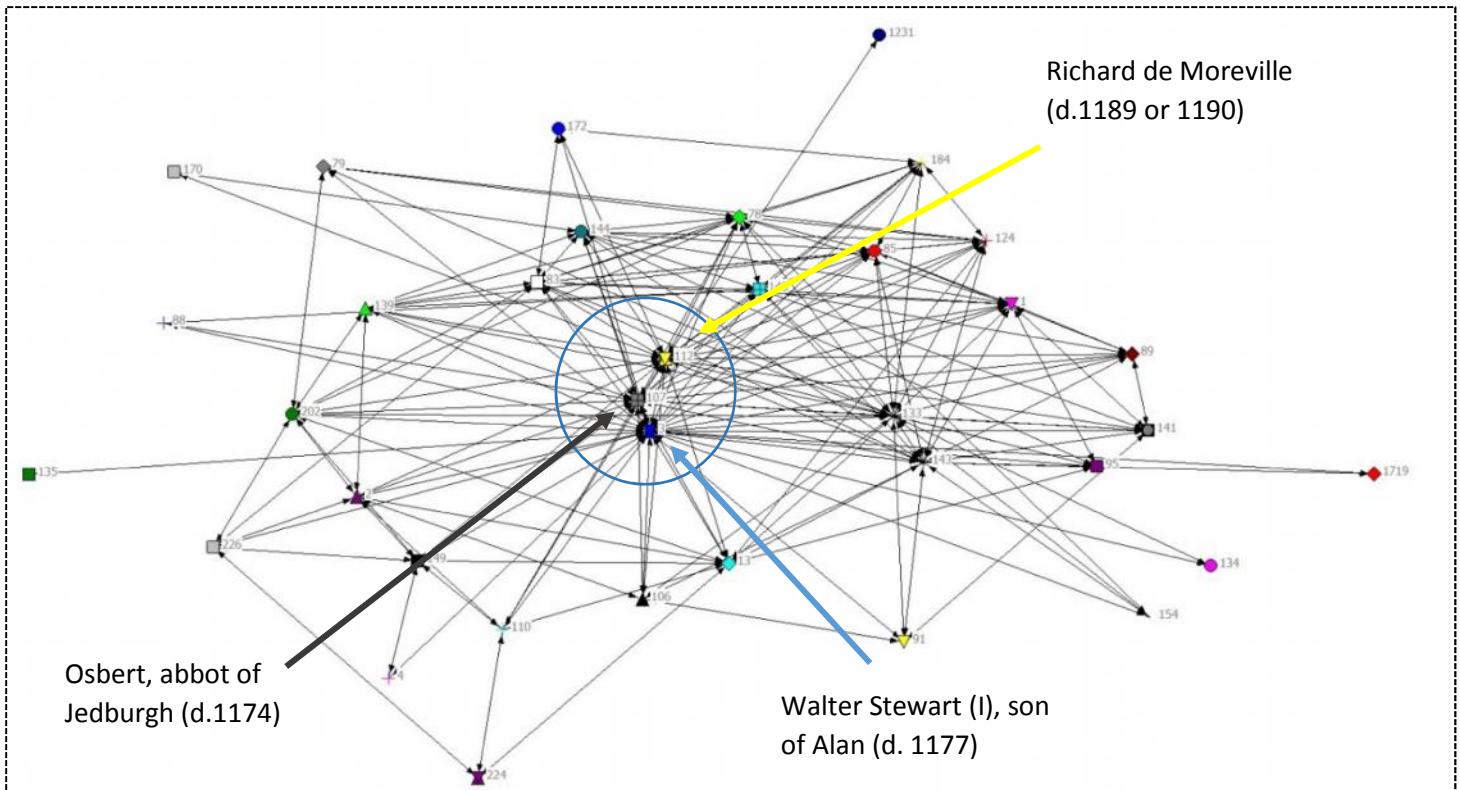


Figure 5.51. Gephi: Malcolm IV witnesses, more than 4 co-witnessing acts

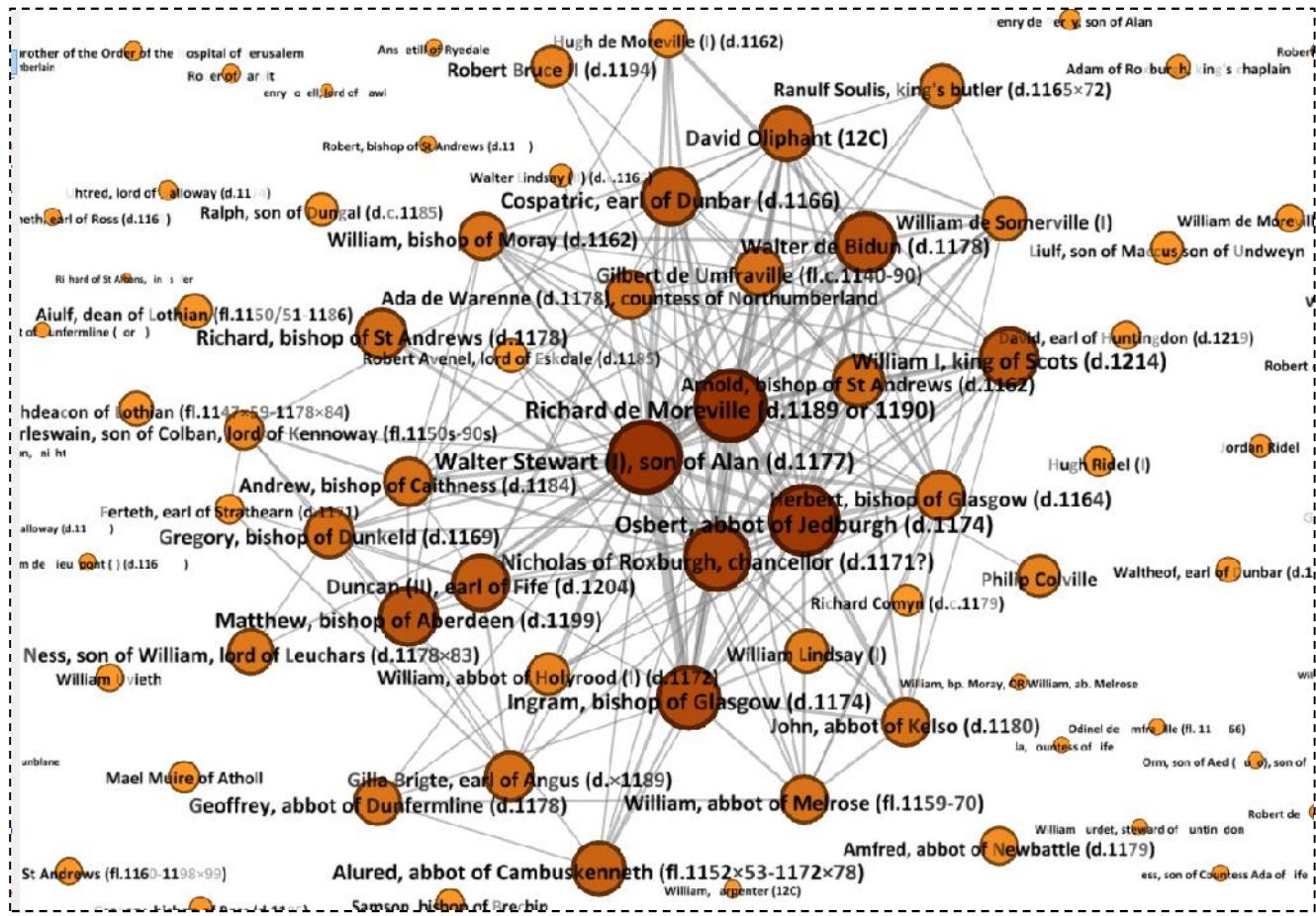


Figure 5.52. Malcolm IV witnesses, more than 5 co-witnessing acts

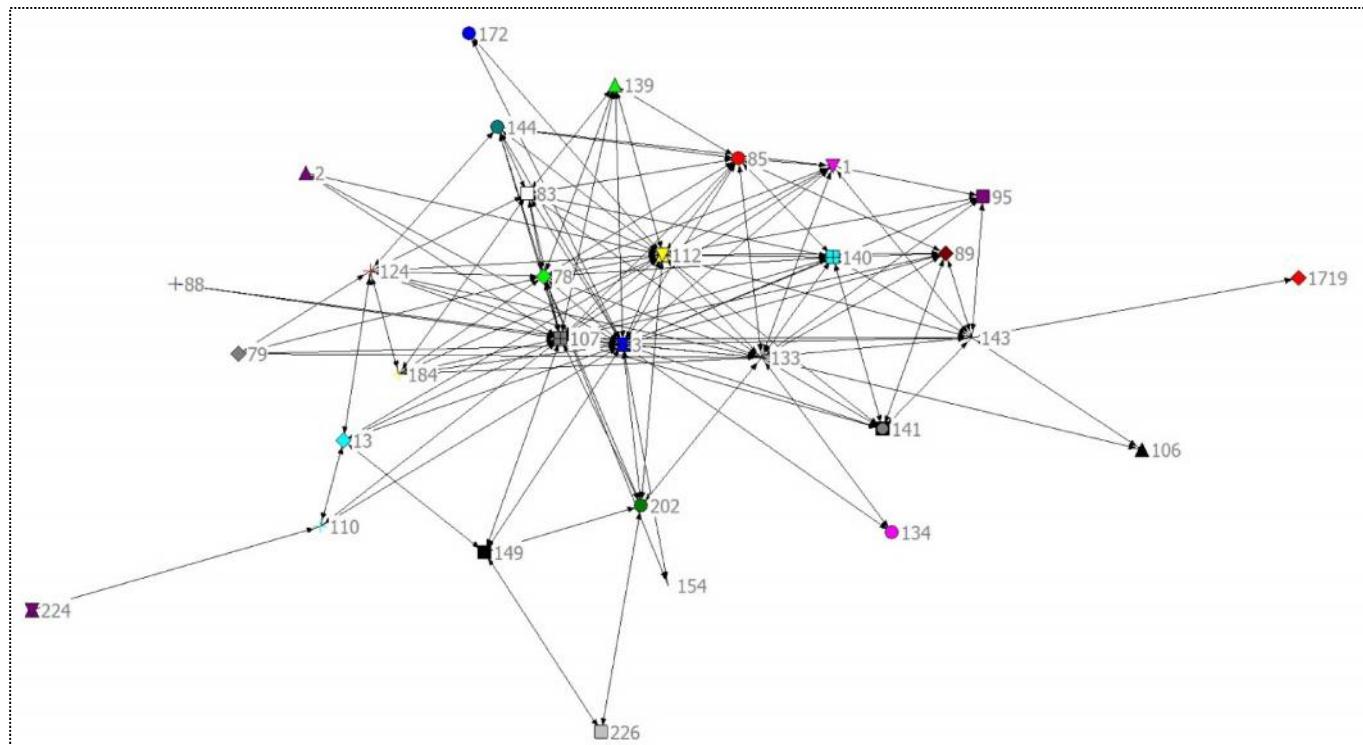
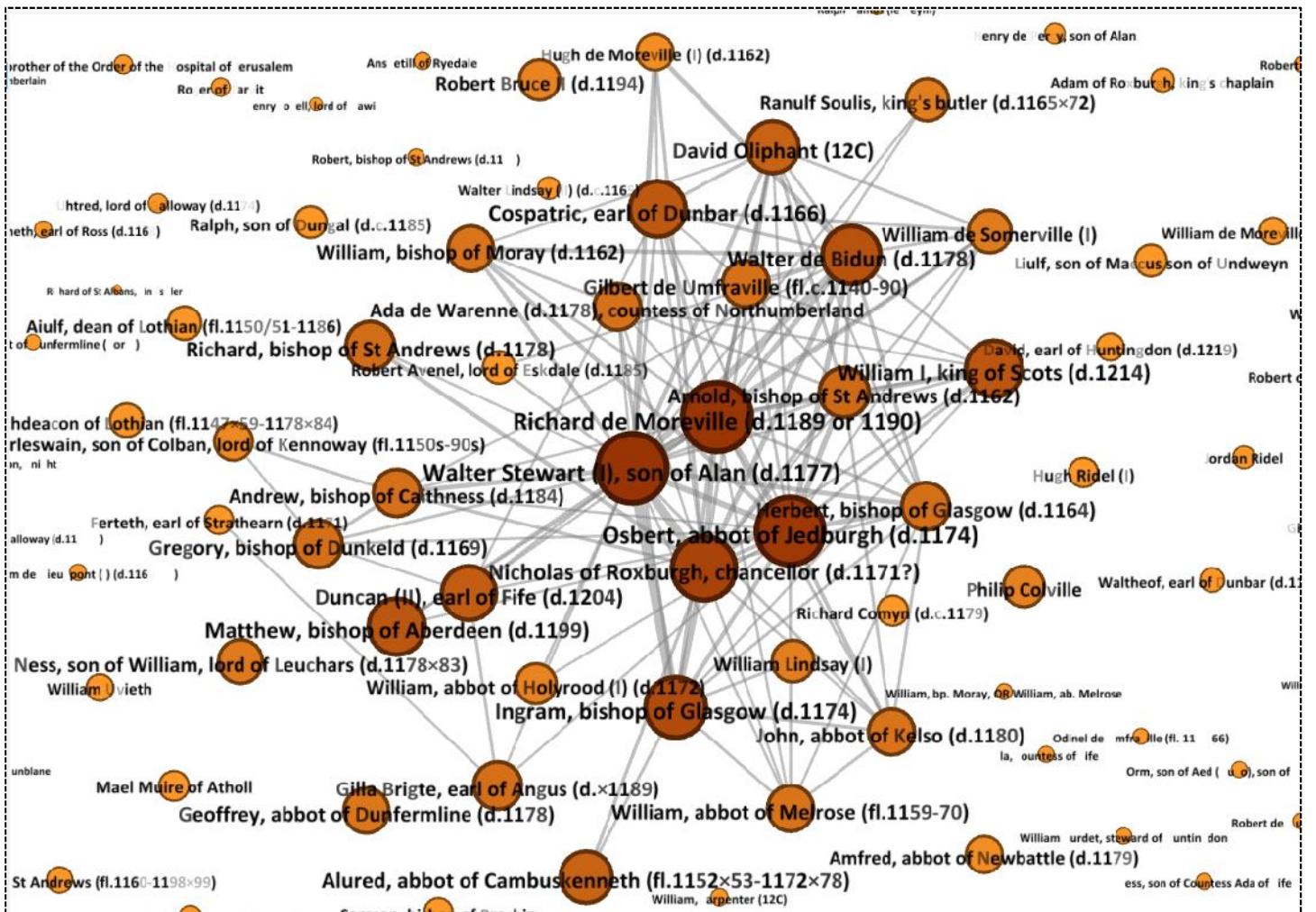


Figure 5.53. Gephi: Malcolm witnesses, more than 5 co-witnessing acts



The predominance of churchmen among Malcolm IV's witnesses is evidence beyond the level of the 15 most central individuals. At least part of this is due to the fact that more of Malcolm's charters seem to have been produced at large political assemblies, but it may go beyond just this, if Malcolm's poor health and posthumous reputation for piety are taken into consideration. This is demonstrated by the below table of the 29 people who co-witnessed Malcolm's charters more than 5 times. Of the top ten (by degree) at this level, 7 are churchmen. Fifteen of the top 25 are churchmen. We should also note that the concentration on Strathclyde, evident in David I's charters, is no longer the case here. Instead we see a more balanced distribution, with more of a showing from individuals based north of Forth, including the Fife landholder Merleswain son of Colban, the earl of Angus Gilli Brigte, and the bishop of Dunkeld, Gregory.

Table 5.19. People who co-witness more than 5 times (churchmen in italics)

	PoMS ID	Label	Degree
1	3	Walter Stewart (I), son of Alan (d.1177)	21
2	112	Richard de Moreville (d.1189 or 1190)	14
3	133	<i>Nicholas of Roxburgh, chancellor (d.1171?)</i>	14
4	78	<i>Walter de Bidun (d.1178)</i>	13
5	107	<i>Osbert, abbot of Jedburgh (d.1174)</i>	12
6	85	<i>Arnold, bishop of St Andrews (d.1162)</i>	10
7	143	<i>Ingram, bishop of Glasgow (d.1174)</i>	10
8	140	<i>Herbert, bishop of Glasgow (d.1164)</i>	8
9	89	<i>John, abbot of Kelso (d.1180)</i>	7
10	83	David Oliphant (12C)	7
11	1	William I, king of Scots (d.1214)	6
12	124	Cospatric, earl of Dunbar (d.1166)	6
13	139	<i>William, bishop of Moray (d.1162)</i>	5
14	184	William de Somerville (I)	5
15	144	Gilbert de Umfraville (fl.c.1140-90)	4
16	202	<i>Andrew, bishop of Caithness (d.1184)</i>	4
17	141	<i>William, abbot of Melrose (fl.1159-70)</i>	3
18	79	Hugh de Moreville (I) (d.1162)	3
19	106	<i>Alured, abbot of Cambuskenneth (fl.1152×53-1172×78)</i>	2
20	149	<i>Gregory, bishop of Dunkeld (d.1169)</i>	2
21	13	Duncan (II), earl of Fife (d.1204)	2
22	110	Gilla Brigte, earl of Angus (d. ×1189)	1
23	2	<i>Matthew, bishop of Aberdeen (d.1199)</i>	1
24	134	<i>Richard, bishop of St Andrews (d.1178)</i>	1
25	88	<i>William, abbot of Holyrood (I) (d.1172)</i>	1
26	95	Ada de Warenne (d.1178), countess of Northumberland	1
27	154	Robert Avenel, lord of Eskdale (d.1185)	1
28	1719	William Lindsay (I)	1
29	226	Merleswain, son of Colban, lord of Kennoway (fl.1150s-90s)	1

As the following sociograms show, the most central witness at the level of more than 10 co-witnessing acts was [3] Walter Stewart, son of Alan. This is partly explained by the fact that he acted as steward and a principle advisor to the young king through the whole period of his reign, while there were changes mid-reign among the other key household positions of constable, chancellor, and chamberlain. The holders of these offices, along with the key spiritual advisor Abbot Osbert, were the people who witnessed together the highest number of times among Malcolm's charters.

Figure 5.54. Netdraw: Malcolm IV witnesses, > 10 co-witnessing acts

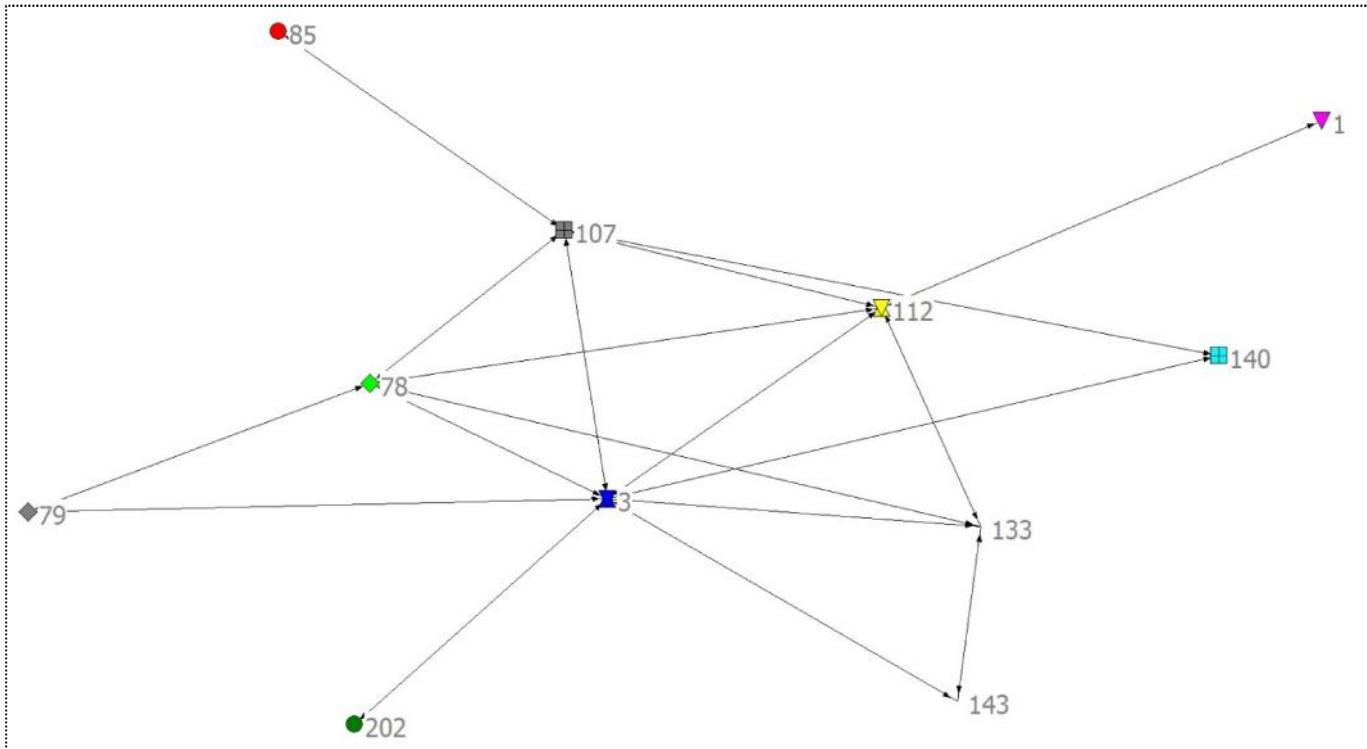


Figure 5.55. Gephi: Malcolm IV witnesses, > 10 co-witnessing acts

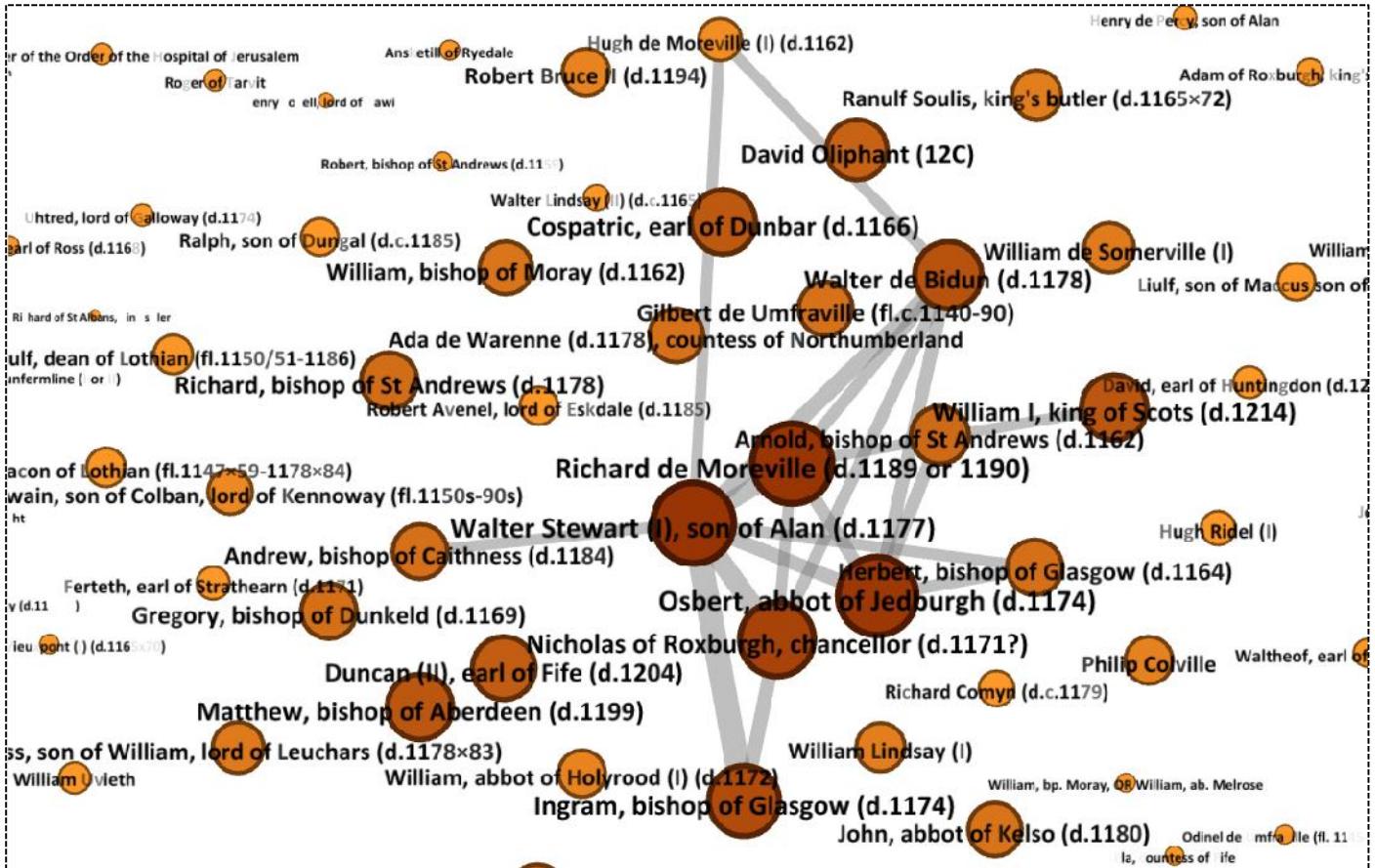


Figure 5.56. Netdraw: Malcolm IV witnesses, > 13 co-witnessing acts

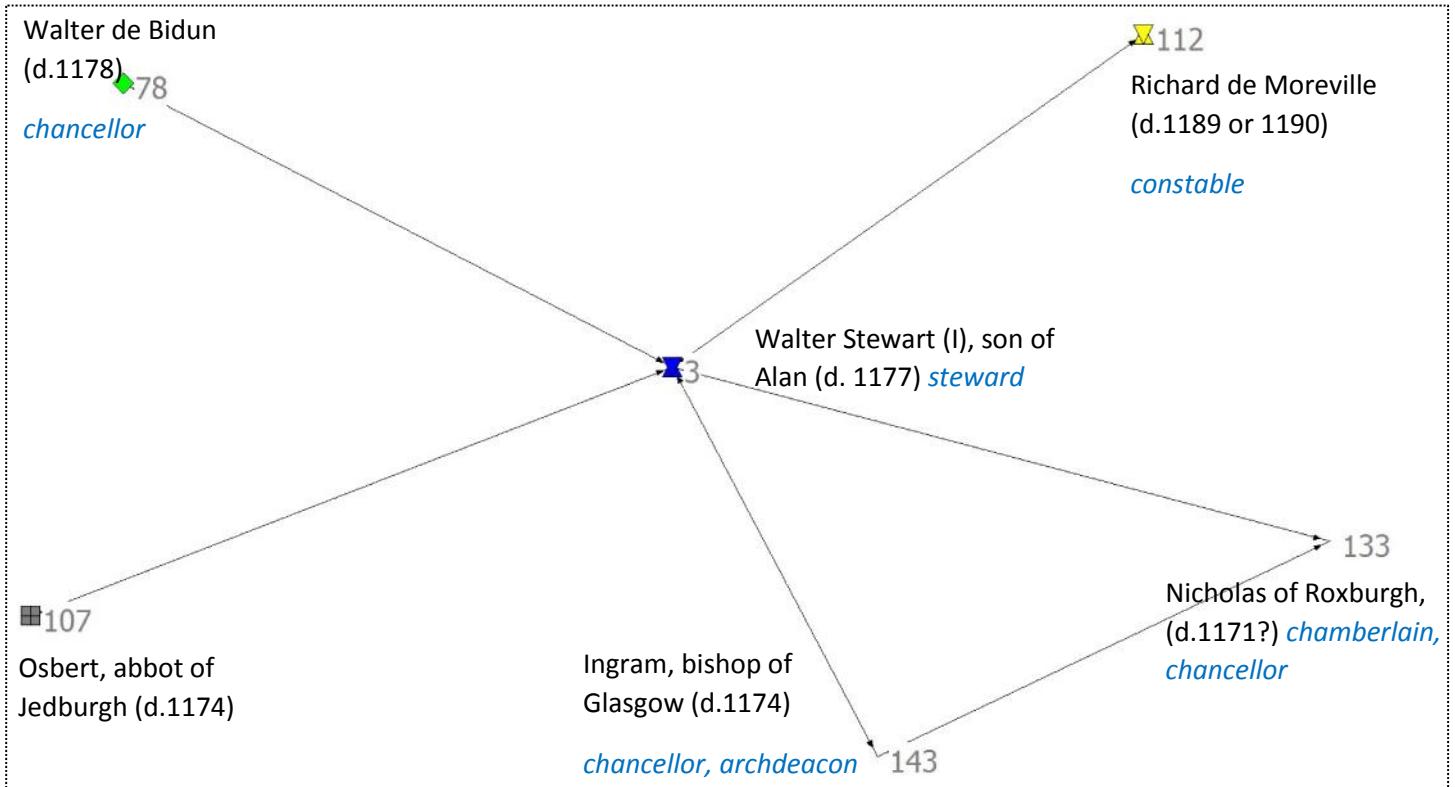


Figure 5.57. Gephi: Malcolm IV witnesses, > 13 co-witnessing acts

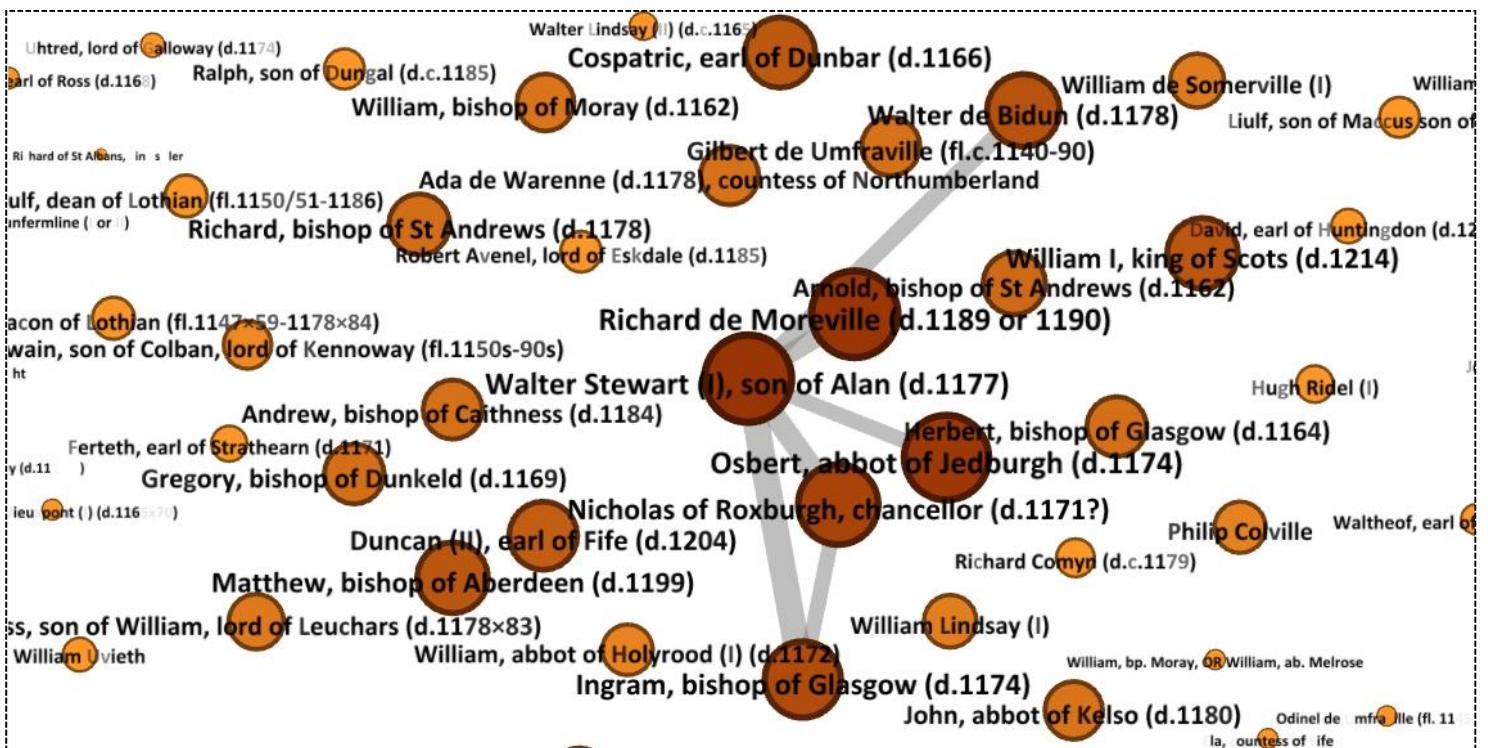


Figure 5.58. Netdraw: Malcolm IV witnesses, > 15 co-witnessing acts

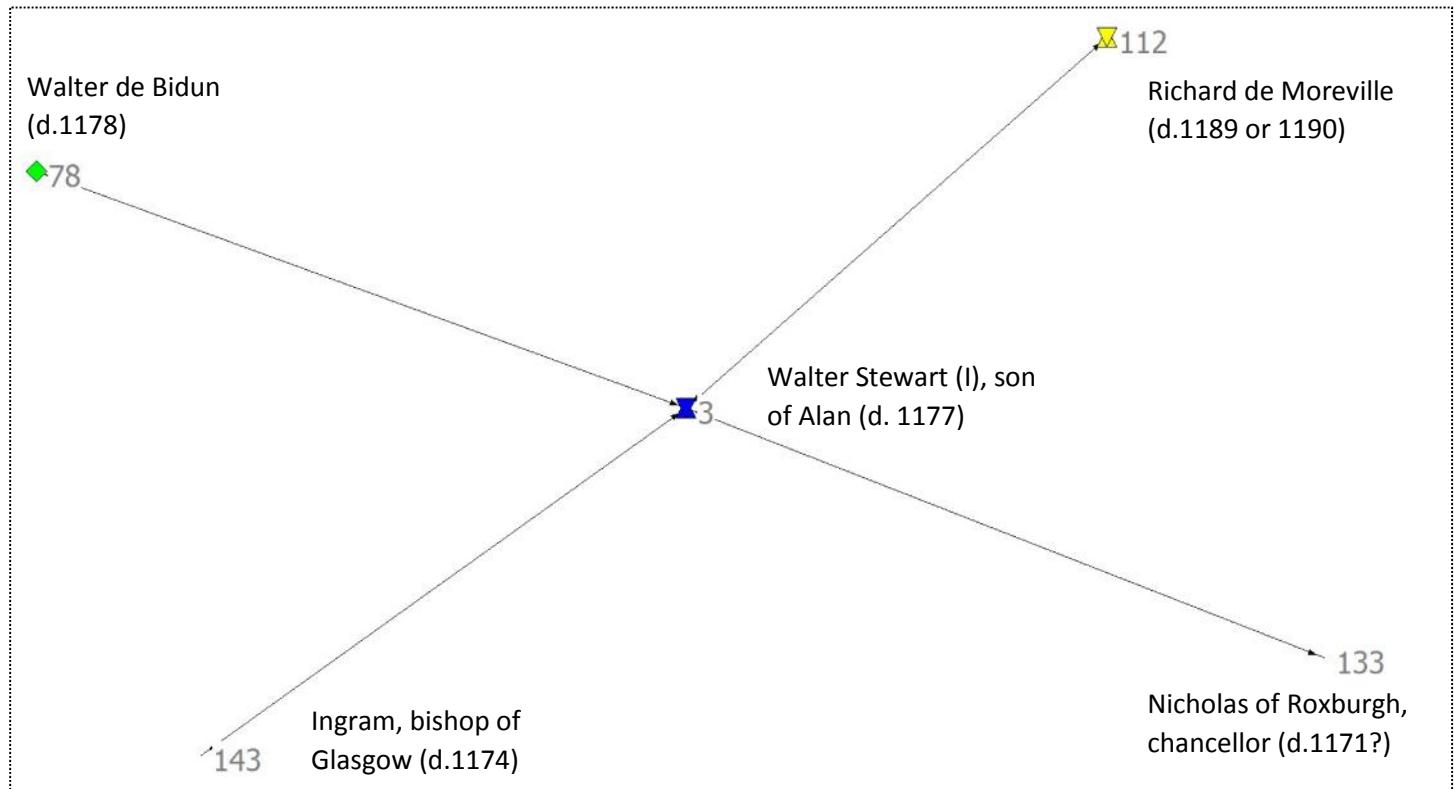


Figure 5.59. Gephi: Malcolm IV witnesses, > 15 co-witnessing acts

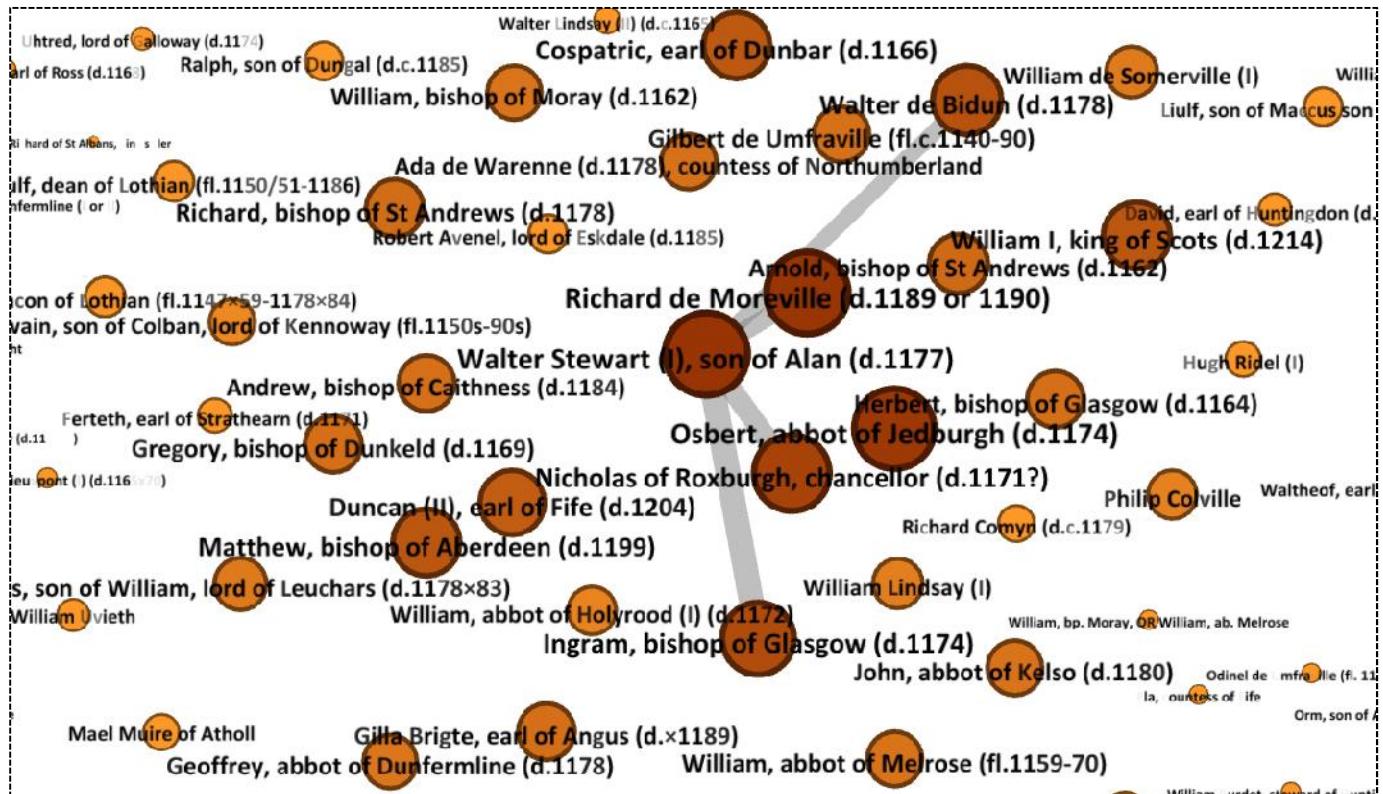


Figure 5.60. Gephi; Malcolm IV witnesses, > 18 co-witnessing acts

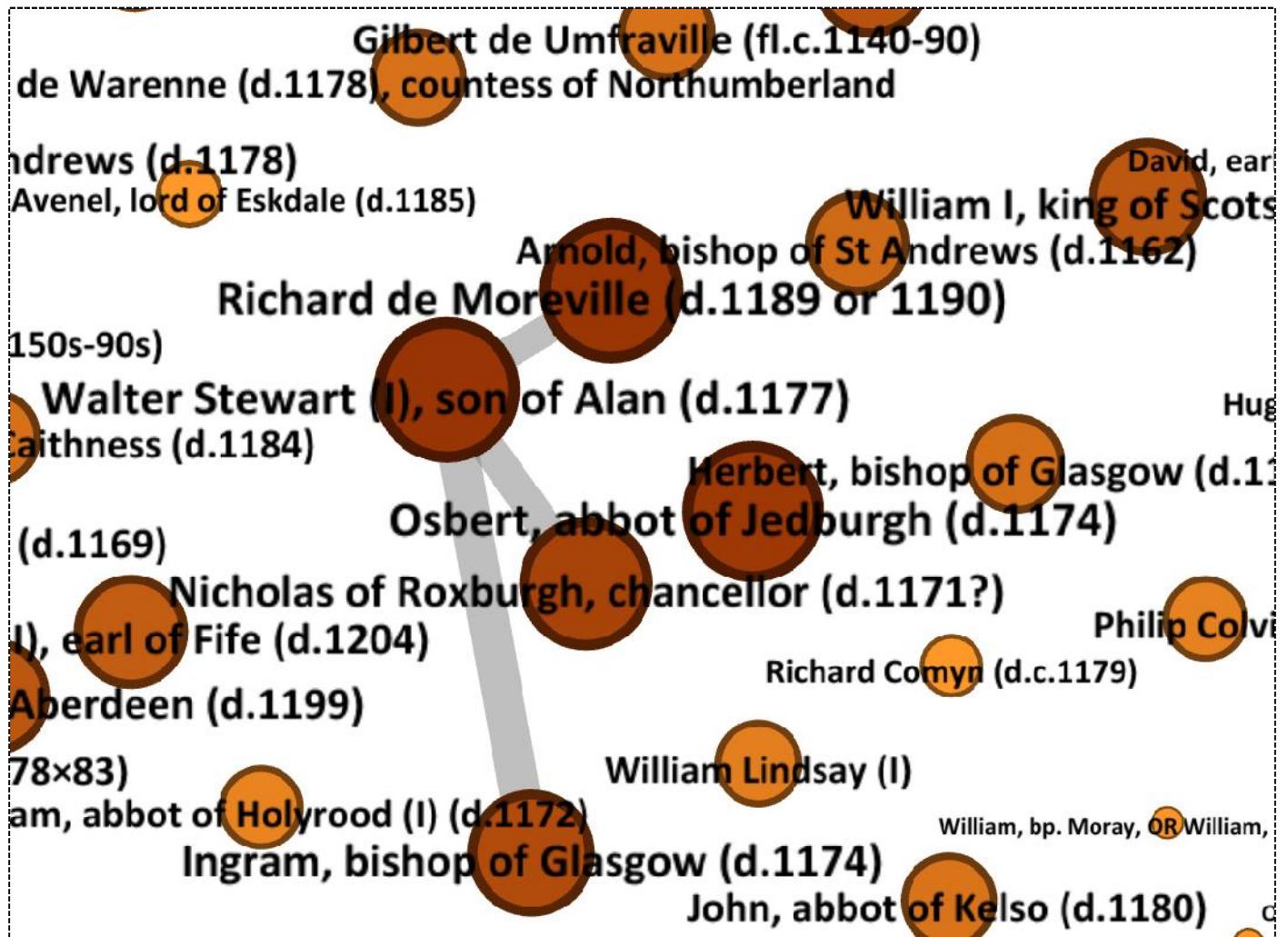


Figure 5.61. Gephi: connections of Walter Stewart (I), son of Alan (d. 1177)

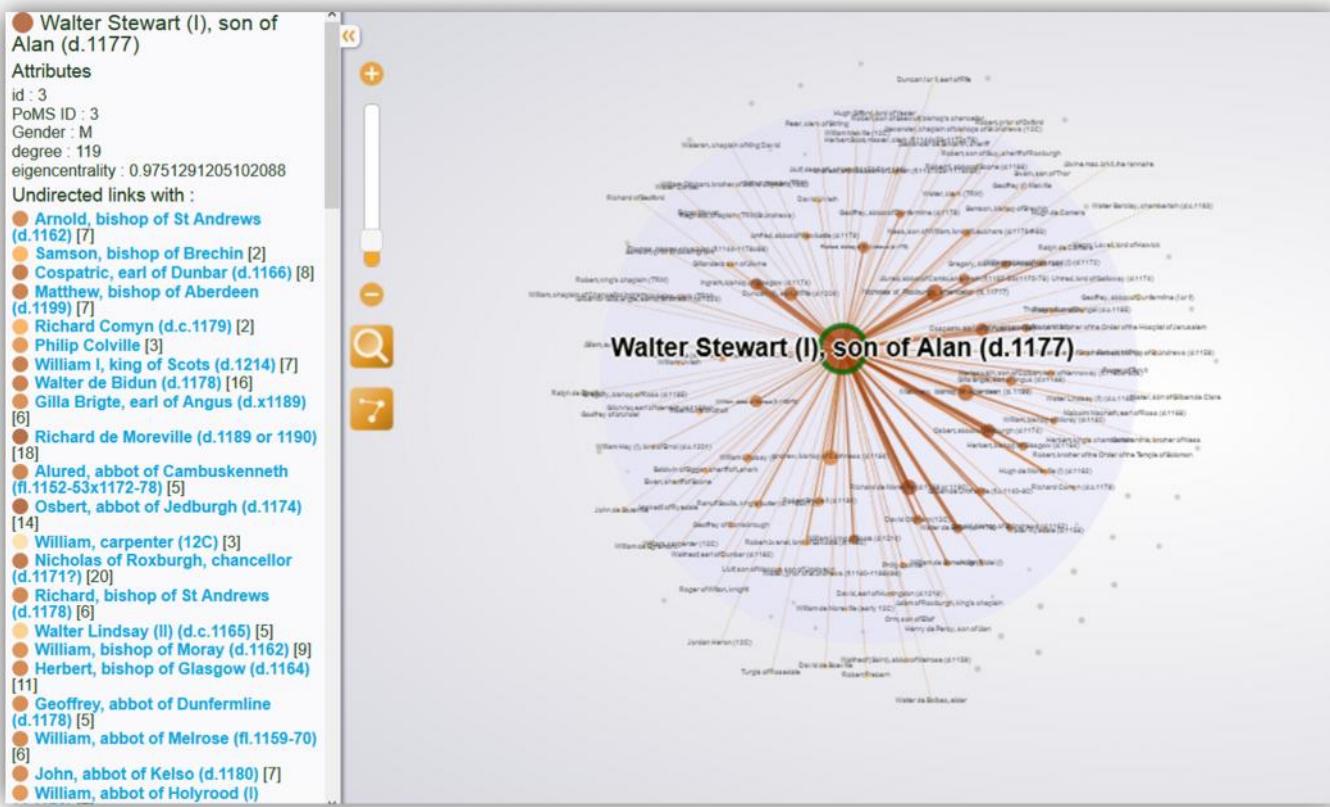


Figure 5.62. Gephi: connections of Richard de Moreville (d. 1189 or 1190)



Table 5.17 shows the implicit relationships of pairs of individuals by listing the numbers of documents co-witnessed more than 9 times. The five most productive relationships all involve Walter Stewart (I), while five of the top ten involve Osbert, abbot of Jedburgh. Ten of the 34 pairs below included Walter (29%), while nine involved Richard de Moreville and Abbot Osbert, respectively (26%).

Table 5.20. Pairs who witnessed together 9 or more times

Person 1	Person 2	# docs
Walter Stewart (I), son of Alan (d.1177)	Ingram, bishop of Glasgow (d.1174)	24
Walter Stewart (I), son of Alan (d.1177)	Nicholas of Roxburgh, chancellor (d.1171?)	20
Richard de Moreville (d.1189 or 1190)	Walter Stewart (I), son of Alan (d.1177)	18
Walter de Bidun (d.1178)	Walter Stewart (I), son of Alan (d.1177)	16
Osbert, abbot of Jedburgh (d.1174)	Walter Stewart (I), son of Alan (d.1177)	14
Nicholas of Roxburgh, chancellor (d.1171?)	Ingram, bishop of Glasgow (d.1174)	14
Arnold, bishop of St Andrews (d.1162)	Osbert, abbot of Jedburgh (d.1174)	13
Osbert, abbot of Jedburgh (d.1174)	Walter de Bidun (d.1178)	13
Osbert, abbot of Jedburgh (d.1174)	Richard de Moreville (d.1189 or 1190)	13
Osbert, abbot of Jedburgh (d.1174)	Herbert, bishop of Glasgow (d.1164)	12
Walter de Bidun (d.1178)	Richard de Moreville (d.1189 or 1190)	12
Walter de Bidun (d.1178)	Nicholas of Roxburgh, chancellor (d.1171?)	12
William I, king of Scots (d.1214)	Richard de Moreville (d.1189 or 1190)	11
Walter de Bidun (d.1178)	Hugh de Moreville (I) (d.1162)	11
Richard de Moreville (d.1189 or 1190)	Nicholas of Roxburgh, chancellor (d.1171?)	11
Walter Stewart (I), son of Alan (d.1177)	Herbert, bishop of Glasgow (d.1164)	11
Walter Stewart (I), son of Alan (d.1177)	Hugh de Moreville (I) (d.1162)	11
Walter Stewart (I), son of Alan (d.1177)	Andrew, bishop of Caithness (d.1184)	11
Osbert, abbot of Jedburgh (d.1174)	William, bishop of Moray (d.1162)	10
Osbert, abbot of Jedburgh (d.1174)	Ingram, bishop of Glasgow (d.1174)	10
Walter de Bidun (d.1178)	William, bishop of Moray (d.1162)	10
Richard de Moreville (d.1189 or 1190)	Ingram, bishop of Glasgow (d.1174)	10
Walter Stewart (I), son of Alan (d.1177)	David Oliphant (12C)	10
Nicholas of Roxburgh, chancellor (d.1171?)	Richard, bishop of St Andrews (d.1178)	10
Arnold, bishop of St Andrews (d.1162)	Walter de Bidun (d.1178)	9
Arnold, bishop of St Andrews (d.1162)	Nicholas of Roxburgh, chancellor (d.1171?)	9
Arnold, bishop of St Andrews (d.1162)	Herbert, bishop of Glasgow (d.1164)	9
Osbert, abbot of Jedburgh (d.1174)	Nicholas of Roxburgh, chancellor (d.1171?)	9
Osbert, abbot of Jedburgh (d.1174)	John, abbot of Kelso (d.1180)	9
Walter de Bidun (d.1178)	Herbert, bishop of Glasgow (d.1164)	9
Richard de Moreville (d.1189 or 1190)	Cospatric, earl of Dunbar (d.1166)	9
Richard de Moreville (d.1189 or 1190)	Gilbert de Umfraville (fl.c.1140-90)	9
Richard de Moreville (d.1189 or 1190)	David Oliphant (12C)	9
Walter Stewart (I), son of Alan (d.1177)	William, bishop of Moray (d.1162)	9

## WILLIAM I (1165-1214)

The study of the witnesses to the documents of King William included 405 documents, of which 4 were notifications, 3 were settlements, 8 were charter/brieves, and 390 were charters proper. This is out of a potential 437 documents: there were 32 documents with no witnesses. All of the co-witnessing studies use the dataset as of October 2014. There were 394 witnesses in the study with 7347 edges. Only one of these, the king's mother, Countess Ada de Warenne (d. 1178), was a woman.

Table 5.21. Top 25 witnesses to William I charters by degree

Rank	Name	Poms ID	Degree
1	Philip de Valognes, chamberlain (d.1215)	15	241
2	Duncan (II), earl of Fife (d.1204)	13	229
3	William Hay (I), lord of Errol (d.c.1201)	24	183
4	Robert de Quincy (d.1200)	14	174
5	<i>Richard de Prebenda, bishop of Dunkeld (d.1210)</i>	798	171
6	<i>Matthew, bishop of Aberdeen (d.1199)</i>	2	168
7	William Lindsay (II) (d.c.1205)	197	159
8	William Comyn, earl of Buchan (d.1233)	16	156
9	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	260	154
9	Walter Barclay, chamberlain (d.c.1193)	6	154
11	David, earl of Huntingdon (d.1219)	142	150
12	Richard de Moreville (d.1189 or 1190)	112	146
(13)	Alan Stewart, son of Walter (d.1204)	400	138
(13)	Robert of London (d.1225)	307	138
14	<i>Richard of Lincoln, bishop of Moray (d.1203)</i>	781	136
15	<i>Hugh de Sigillo, bishop of Dunkeld (d.1229 or 1230)</i>	39	134
16	Patrick (I), earl of Dunbar (d.1232)	444	128
17	Malcolm (I), earl of Fife (d.1229)	782	127
(18)	Robert Barclay, brother of Walter	750	126
(18)	<i>Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)</i>	820	126
19	Walter Stewart (I), son of Alan (d.1177)	3	124
20	<i>Jocelin, bishop of Glasgow (d.1199)</i>	745	116
(21)	William de Moreville (d.1196)	310	113
(21)	<i>Andrew, bishop of Caithness (d.1184)</i>	202	113
22	Richard Comyn (d.c.1179)	114	109

The most notable difference with the top players in Malcolm IV's reign is that fewer of the William's most active witnesses were churchmen – only two of the top ten, and 7 of the top 25. Duncan (II), earl of Fife (d. 1204), and Philip de Valognes (d. 1215) are the two most central actors in William's charters, with Philip being connected to twelve more people than Duncan, giving him a degree of 241 rather than 229, and with Duncan claiming the highest eigenvector centrality in the group. However, with Philip's 98% eigenvector score, he is nearly as central to Duncan in that regard. Both men had long careers which lasted most of the king's reign. Philip was William's chamberlain from 1165 to circa 1171, a position to which he returned around 1193 and held until his death in 1215, shortly after the king's. Earl Duncan, as we have seen, was already earl of Fife and an active witness under King Malcolm; he was the most active royal justice for much of William's reign, until his death in 1204. There is not a great deal of difference among the top ten whether judging by degree or eigenvector. The principle players included William Hay, the king's butler, and Robert de Quincy, a sometime royal justice, but it is not at all clear that their centrality relied principally on these positions. Both men had long careers and died around 1200. Most of the top players were more active in the middle part of the king's reign than in the period after around 1200. The principle exceptions to this are [16] William Comyn, earl of Buchan (d.1233) and [444] Patrick (I), earl of Dunbar (d.1232), and [782] Malcolm (I), earl of Fife (d.1229).

Table 5.22. Comparison of centrality by eigenvector versus degree (churchmen in italics)

Rank	Name	Poms Id	Eigenvector	Degree	Degree rank
1	Duncan (II), earl of Fife (d.1204)	13	1	229	2
2	Philip de Valognes, chamberlain (d.1215)	15	0.980672	241	1
3	William Hay (I), lord of Errol (d.c.1201)	24	0.885806	183	3
4	Robert de Quincy (d.1200)	14	0.865879	174	4
5	<i>Richard de Prebenda, bishop of Dunkeld (d.1210)</i>	798	0.844523	171	5
6	William Lindsay (II) (d.c.1205)	197	0.815123	159	7
7	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	260	0.810168	154	(9)
8	<i>Matthew, bishop of Aberdeen (d.1199)</i>	2	0.804207	168	6
9	Walter Barclay, chamberlain (d.c.1193)	6	0.773083	154	(9)
10	David, earl of Huntingdon (d.1219)	142	0.756741	150	11
11	William Comyn, earl of Buchan (d.1233)	16	0.729943	156	8
12	Alan Stewart, son of Walter (d.1204)	400	0.718569	138	(13)

<b>13</b>	Patrick (I), earl of Dunbar (d.1232)	444	0.693994	128	16
<b>14</b>	Robert Barclay, brother of Walter	750	0.686597	126	(18)
<b>15</b>	<i>Richard of Lincoln, bishop of Moray (d.1203)</i>	781	0.685176	136	14
<b>16</b>	Richard de Moreville (d.1189 or 1190)	112	0.68466	146	12
<b>17</b>	<i>Jocelin, bishop of Glasgow (d.1199)</i>	745	0.679225	116	20
<b>18</b>	Robert of London (d.1225)	307	0.678446	138	(13)
<b>19</b>	Malcolm (I), earl of Fife (d.1229)	782	0.667138	127	17
<b>20</b>	William de Moreville (d.1196)	310	0.652904	113	(21)
<b>21</b>	<i>Hugh de Sigillo, bishop of Dunkeld (d.1229 or 1230)</i>	39	0.651846	134	15
<b>22</b>	<i>Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)</i>	820	0.629106	126	(18)
<b>23</b>	<i>Archibald, abbot of Dunfermline (d.1198)</i>	419	0.617573	104	28
<b>24</b>	<i>Robert, archdeacon of Glasgow (d.1222)</i>	797	0.603766	104	27
<b>25</b>	Gervase Avenel, lord of Eskdale (d.1219)	854	0.588283	106	26

The churchmen who do appear often in William's charters are more likely than not to be the king's clerks and chaplains. These included Richard, sometime clerk of the provender, whom the king appointed to the bishopric of Dunkeld in 1203, and Hugh, sometime clerk of the seal, who was raised to the same episcopal see at the very end of William's reign. Richard of Lincoln, bishop of Moray (d.1203), had also been a longtime royal clerk. Hugh of Roxburgh, another royal clerk, was raised to the chancellorship in 1189, and was eventually given the bishopric of Glasgow, but died before he could be consecrated. The position of Bishop Andrew of Caithness, a kind of in-house bishop for the royal court from around 1147 until shortly before his death in 1184, on the other hand, was clearly one of influence, but is harder to define. Bishop Matthew of Aberdeen (d. 1199), former archdeacon of St Andrews, was also a frequent witness and likely an influential power player.

There were a number of other significant lay actors among William's charters. These included the family members Robert of London, the king's bastard son, and David earl of Huntingdon, his brother. The positions of constable and steward continued to be important, but eventually waned in comparison to their overarching importance under Malcolm IV. Walter son of Alan, the steward (d. 1177), was succeeded by his son, Alan (d. 1204), while Richard de Moreville, the constable, lived until 1189 or 1190 and was succeeded by his son, William, who died in 1196. Alan Stewart left a son, Walter (II), who was probably a minor in 1204, and the constableship passed by marriage to the lords of Galloway in 1196, so the position of these offices diminished at royal court after 1204 and 1196 respectively.

The greatest determinant of a high ranking in these league tables other than holding a top-level household office, was acting as a king's justice.

Table 5.23. Top players and their positions

Name	PoMS ID	Position
Philip de Valognes, chamberlain (d.1215)	15	Chamberlain, ca 1165-ca 1171 Chamberlain, ca 1193 to 1215
Duncan (II), earl of Fife (d.1204)	13	Justice
William Hay (I), lord of Errol (d.c.1201)	24	Butler
Robert de Quincy (d.1200)	14	Justice (1170s)
<i>Richard de Prebenda, bishop of Dunkeld (d.1210)</i>	798	King's clerk, ca 1170 – 1203 Bishop of Dunkeld, 1203-10)
<i>Matthew, bishop of Aberdeen (d.1199)</i>	2	Archdeacon of St Andrews (-1172) Bishop of Aberdeen (1172-99)
William Lindsay (II) (d.c.1205)	197	Justice (1190s)
William Comyn, earl of Buchan (d.1233)	16	Justice (1204-)
Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	260	Justice
Walter Barclay, chamberlain (d.c.1193)	6	Chamberlain, ca 1171 to ca 1193
David, earl of Huntingdon (d.1219)	142	King's brother
Richard de Moreville (d.1189 or 1190)	112	Constable, 1162-89
Alan Stewart, son of Walter (d.1204)	400	Steward
Robert of London (d.1225)	307	King's (illegitimate) son
<i>Richard of Lincoln, bishop of Moray (d.1203)</i>	781	King's clerk, ca 1165 – 1187 Bishop of Moray, 1187-1203
<i>Hugh de Sigillo, bishop of Dunkeld (d.1229 or 1230)</i>	39	King's clerk, ca 1180 – 1214 Bishop of Dunkeld, 1214-1229/30.
Patrick (I), earl of Dunbar (d.1232)	444	Earl of Dunbar (check) justice
Malcolm (I), earl of Fife (d.1229)	782	Earl of Fife (1204-)
Robert Barclay, brother of Walter	750	
<i>Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)</i>	820	King's clerk Chancellor, 1189-99
Walter Stewart (I), son of Alan (d.1177)	3	Steward (-1177)
<i>Jocelin, bishop of Glasgow (d.1199)</i>	745	Abbot of Melrose Bishop of Glasgow, 1175-99
William de Moreville (d.1196)	310	Constable, 1190-96
<i>Andrew, bishop of Caithness (d.1184)</i>	202	'court bishop'
Richard Comyn (d.c.1179)	114	Justice (1170s)

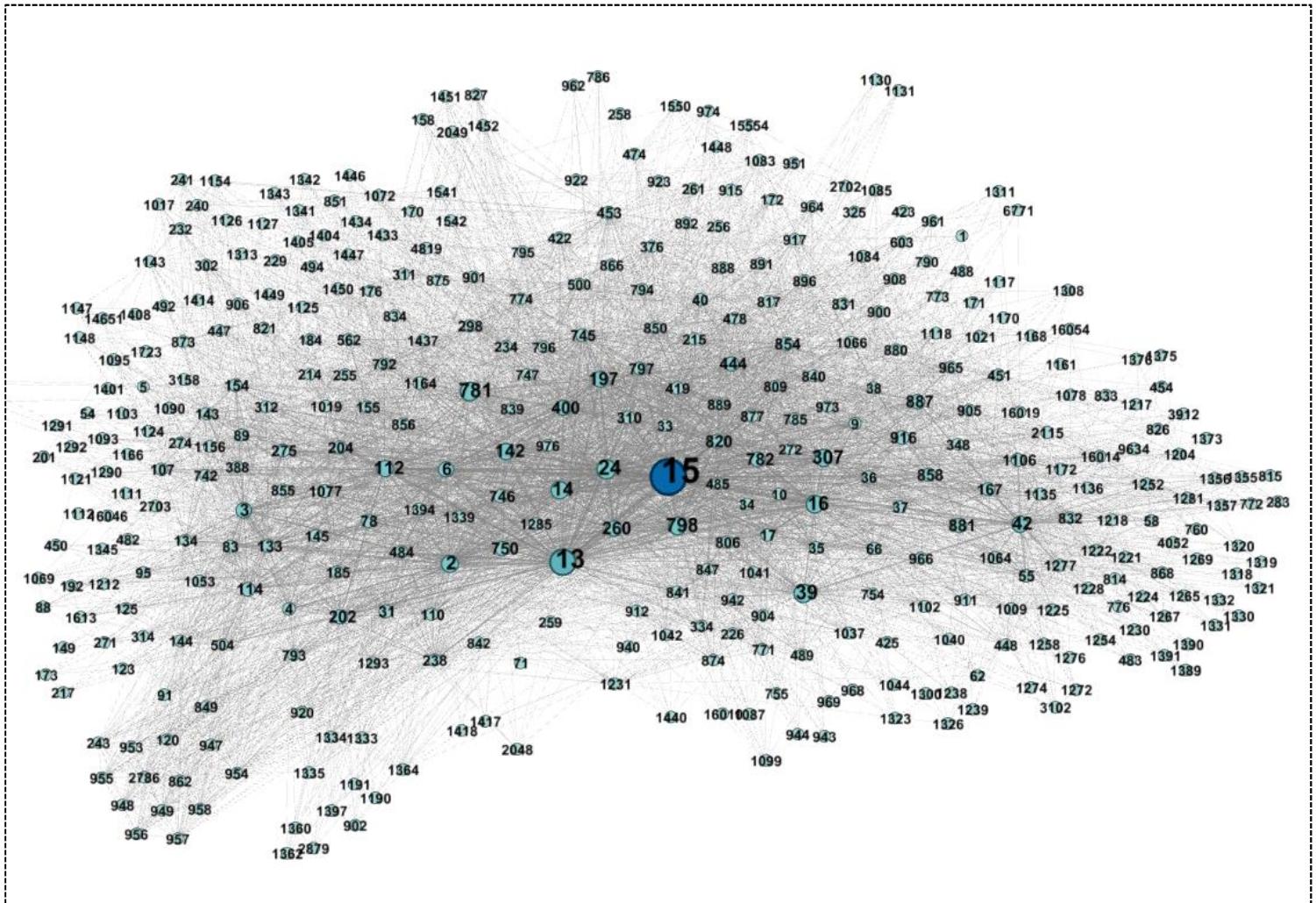
The top individuals by betweenness centrality are not all that different than the degree and eigenvector lists, with the exception that Philip de Valognes [15] has by far the highest betweenness in the sociogram. This is likely because in addition to being very well-connected, he also had the advantage

of being active from 1165 to 1214, although he may have been out of the kingdom at points in the middle.

Table 5.24. Comparison of centrality by betweenness

Rank	Name	PoMS ID	Degree	Eigenvector	Betweenness
1	Philip de Valognes, chamberlain (d.1215)	15	241	0.980672	9729.238
2	Duncan (II), earl of Fife (d.1204)	13	229	1	5757.236
3	William Hay (I), lord of Errol (d.c.1201)	24	183	0.885806	3090.154
4	Richard of Lincoln, bishop of Moray (d.1203)	781	136	0.685176	2814.568
5	Hugh de Sigillo, bishop of Dunkeld (d.1229 or 1230)	39	134	0.651846	2805.337
6	Richard de Prebenda, bishop of Dunkeld (d.1210)	798	171	0.844523	2418.364
7	William Comyn, earl of Buchan (d.1233)	16	156	0.729943	2385.647
8	Robert de Quincy (d.1200)	14	174	0.865879	2364.766
9	Robert of London (d.1225)	307	138	0.678446	2286.548
10	Matthew, bishop of Aberdeen (d.1199)	2	168	0.804207	2219.599
11	William del Bois, chancellor (d.1232)	42	100	0.316452	1910.671
12	Richard de Moreville (d.1189 or 1190)	112	146	0.68466	1902.123
13	David, earl of Huntingdon (d.1219)	142	150	0.756741	1872.054
14	William Lindsay (II) (d.c.1205)	197	159	0.815123	1718.424
15	Walter Stewart (I), son of Alan (d.1177)	3	124	0.54752	1548.228
16	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	260	154	0.810168	1531.43
17	Walter Barclay, chamberlain (d.c.1193)	6	154	0.773083	1481.742
18	Alan Stewart, son of Walter (d.1204)	400	138	0.718569	1335.39
19	Malcolm (I), earl of Fife (d.1229)	782	127	0.667138	1281.657
20	Andrew, bishop of Caithness (d.1184)	202	113	0.564683	1172.295
21	Richard, son of Hugh de Camera	887	96	0.503044	1162.64
22	Robert Barclay, brother of Walter	750	126	0.686597	1130.381
23	Patrick (I), earl of Dunbar (d.1232)	444	128	0.693994	1094.268
24	Herbert de Camera	881	80	0.413664	1083.076
25	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	820	126	0.629106	984.2755

Figure 5.63. Gephi: witnesses to documents of William I, adjusted to betweenness



The following series of sociograms reveals the key relationships between top players in William's reign. The dataset for William's reign is much larger than those for previous kings. Its 405 documents and 394 witnesses are well over twice the corresponding numbers for Malcolm's and David's reigns. The graph's density of 0.095 is considerably smaller than the densities of David's (0.143) and especially Malcolm's (0.224) sociograms: this is the result of a reign of nearly half a century in length, and a greater likelihood of witnesses not knowing each other. The key players in William's reign were sometimes of different generations: William Comyn, earl of Buchan (d. 1233) and William del Bois, king's clerk and chancellor (d. 1232) were clearly of a later generation than Duncan (II), earl of Fife (d. 1204), William Hay, butler (d. ca 1201) and Robert de Quincy (d. 1200), who were themselves of a slightly later generation than Walter Stewart son of Alan (d. 1177), Richard de Moreville (d. 1189 or 1190) or even Matthew, bishop of Aberdeen (d. 1199). This issue will be addressed at a later point.

Figure 5.64. Gephi: Witnesses to documents of William I (1165-1214)

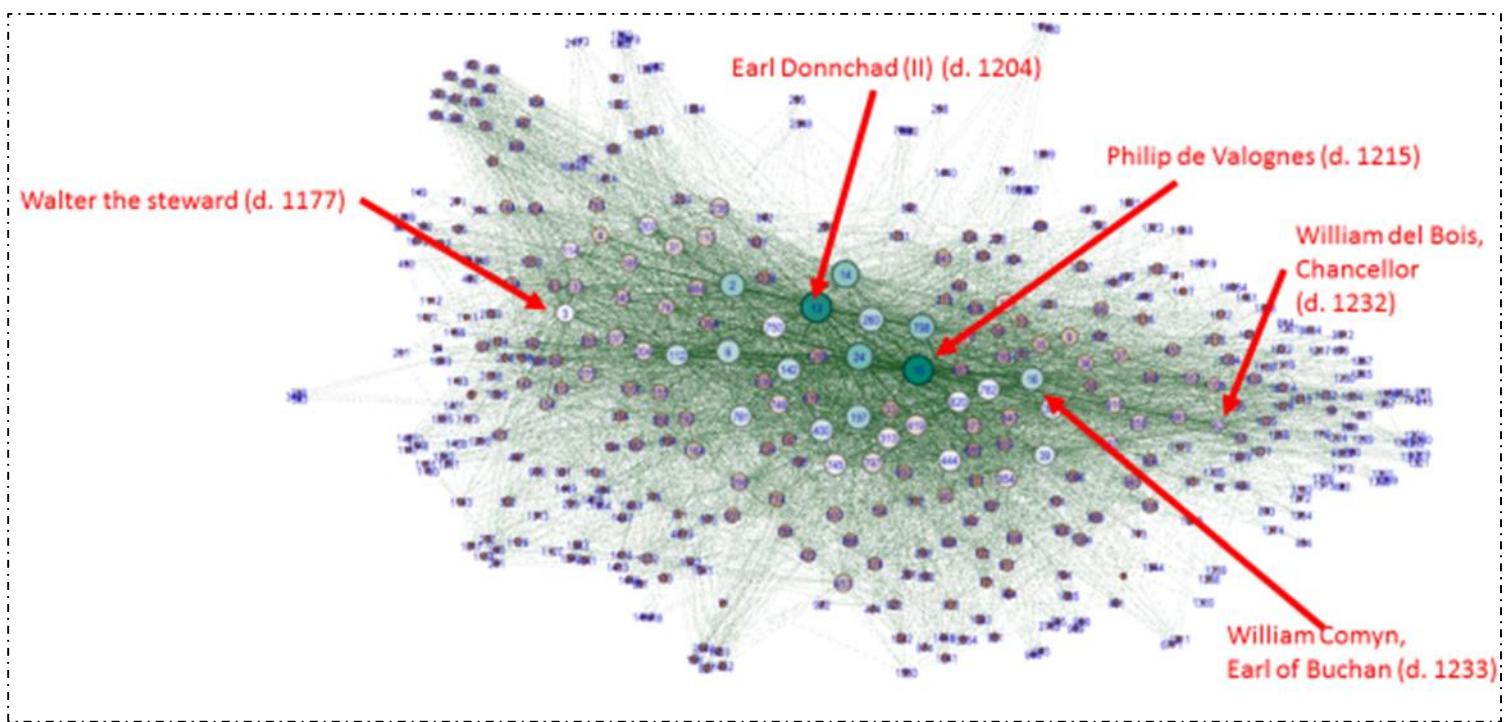


Figure 5.65. Netdraw: witnesses to documents of William I

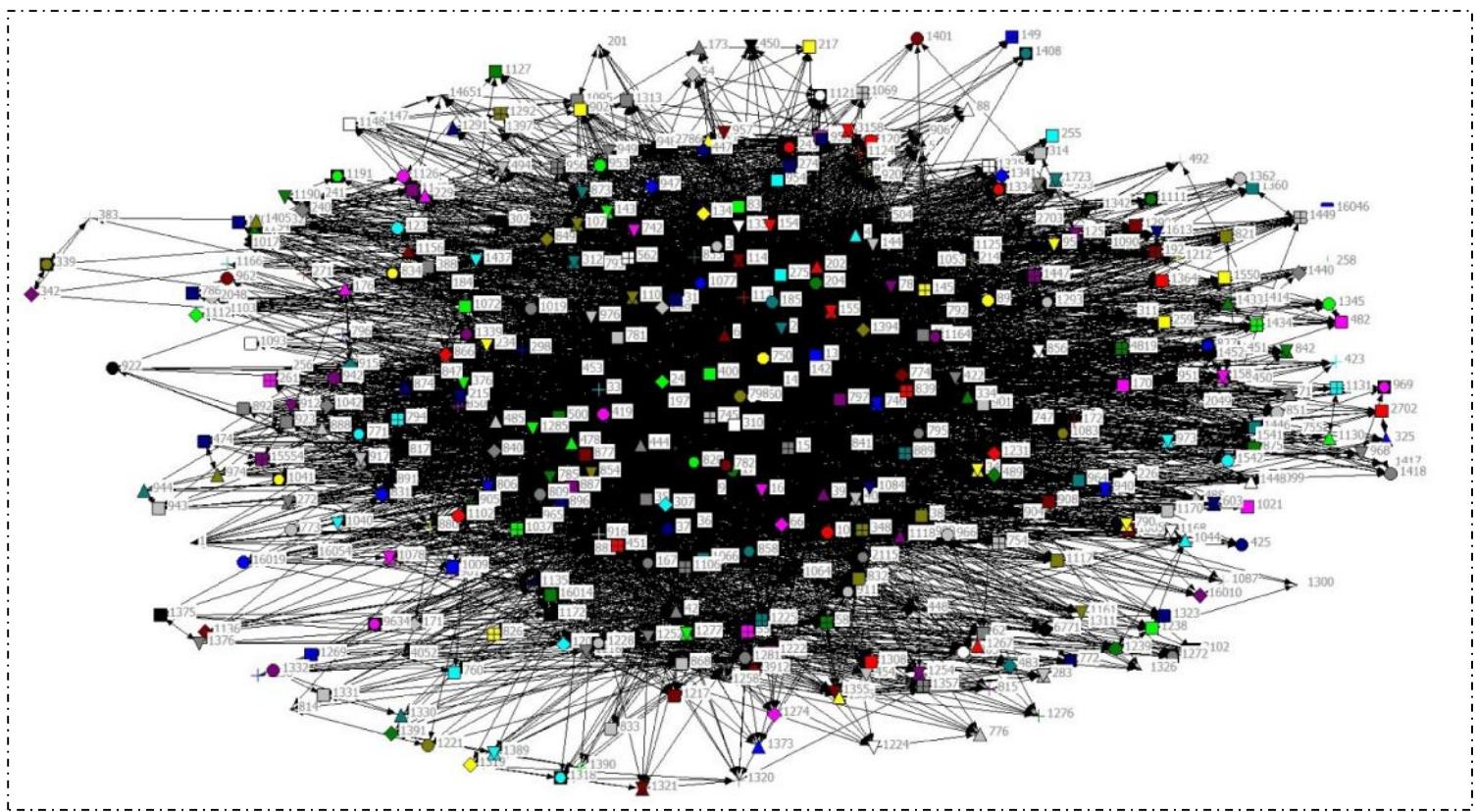


Figure 5.66. Netdraw: William I witnesses, more than 2 co-witnessing acts

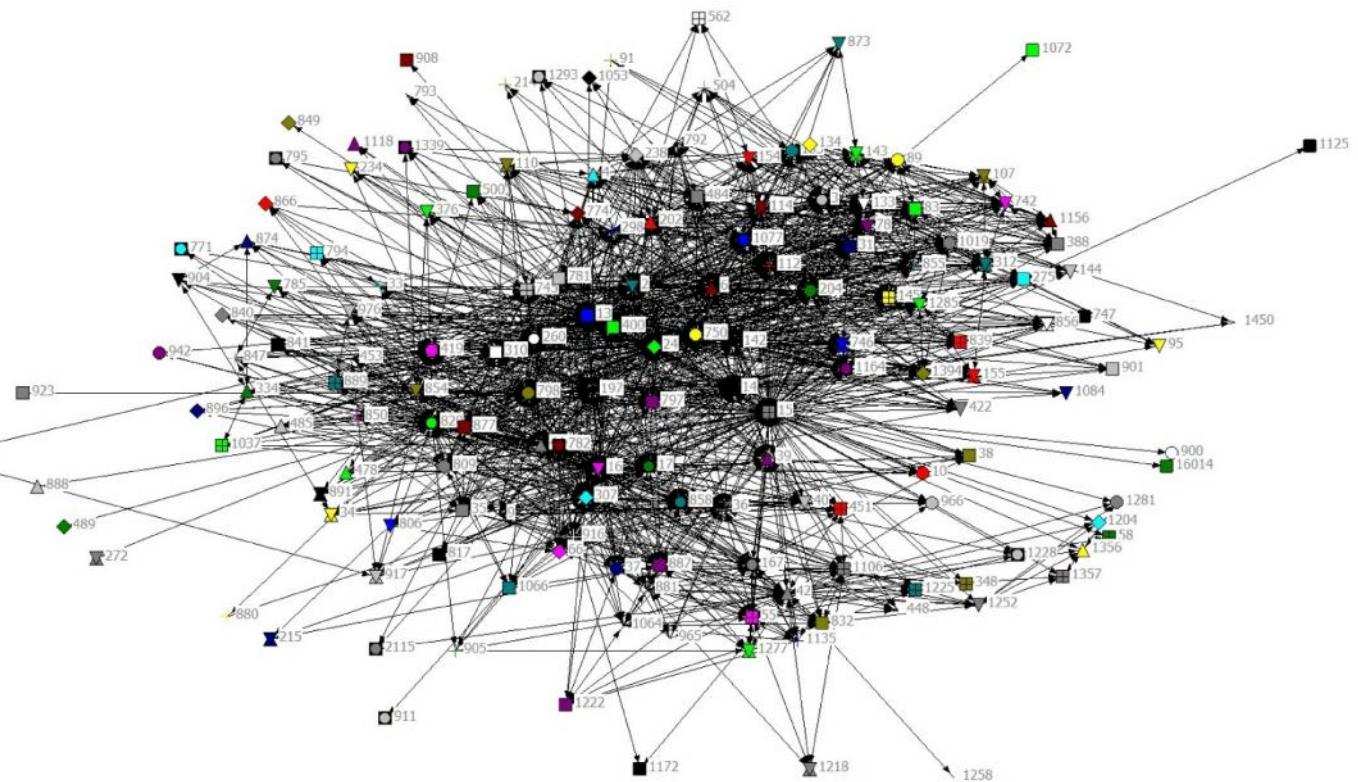


Figure 5.67. Netdraw: William I witnesses, more than 5 co-witnessing acts

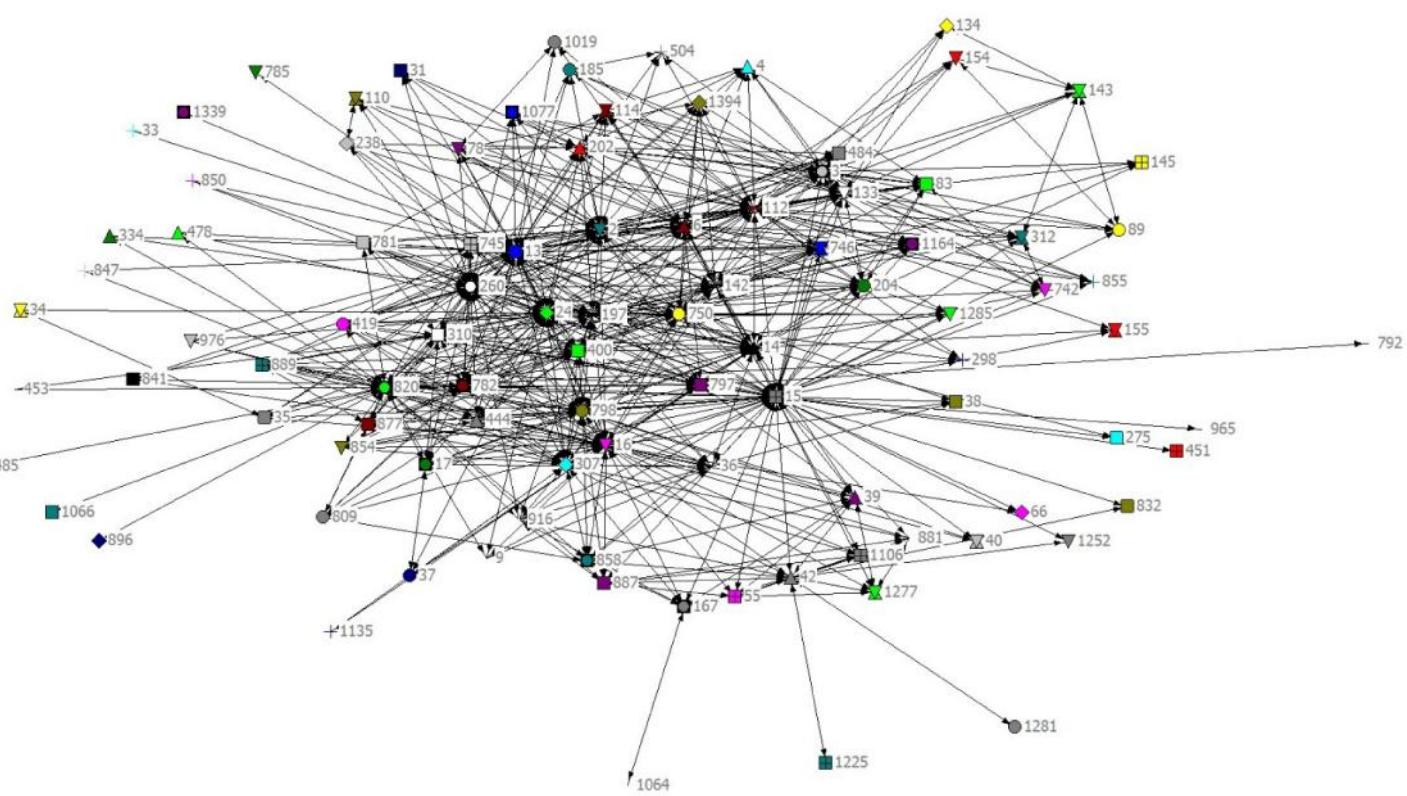


Figure 5.68. Netdraw: William I witnesses, more than 8 co-witnessing acts

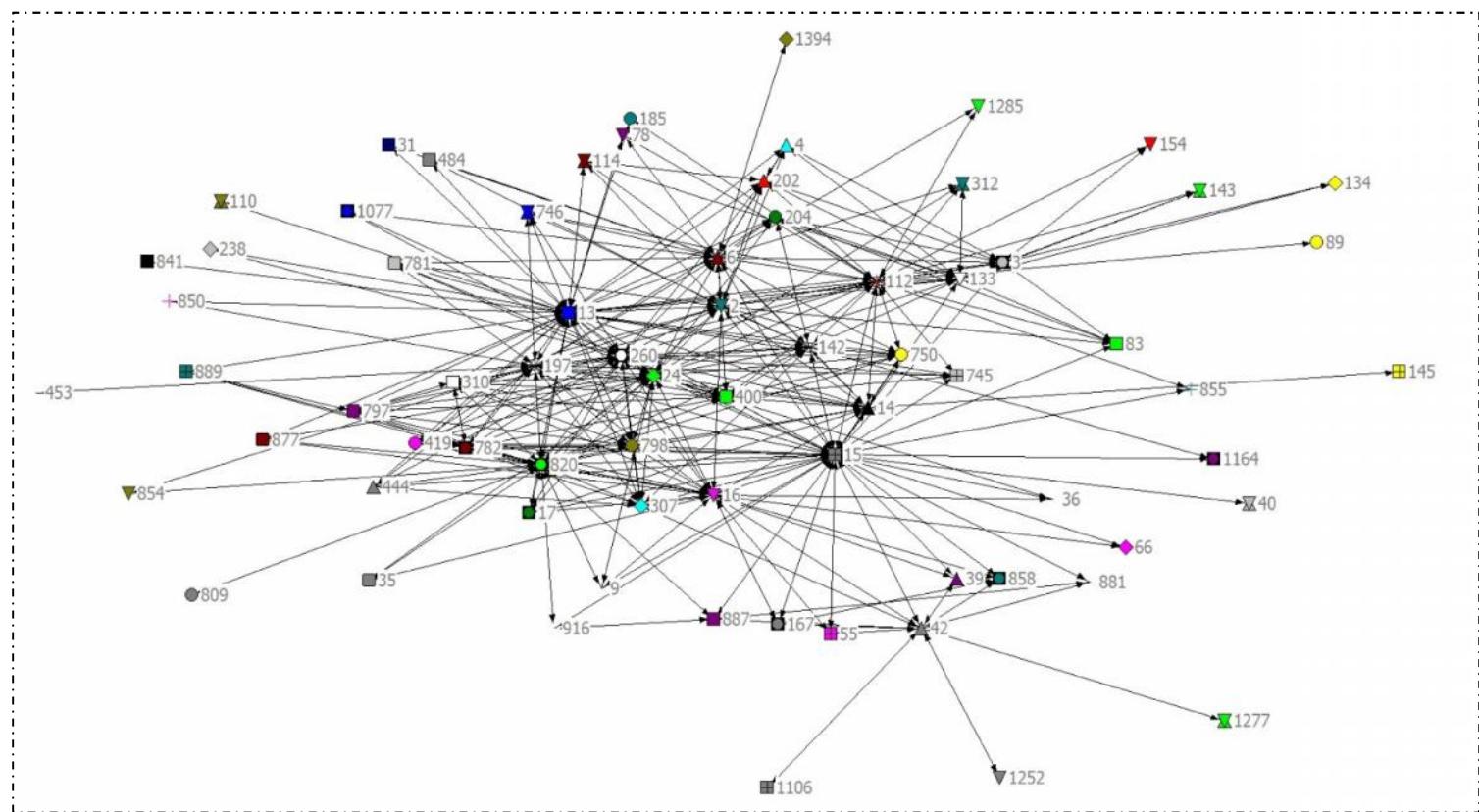


Figure 5.69. Netdraw: William I witnesses, more than 10 co-witnessing acts

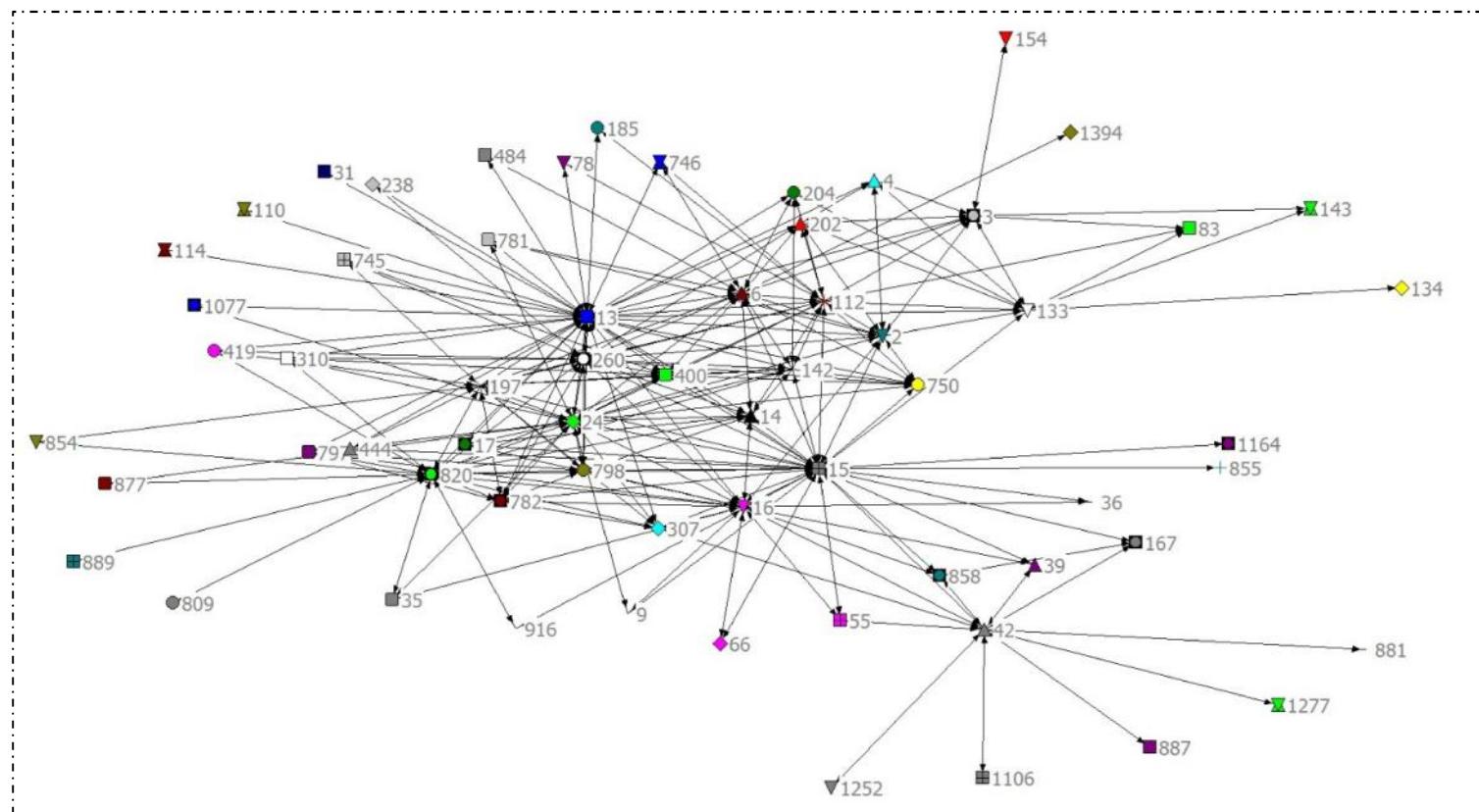


Figure 5.70. Gephi: William I witnesses, more than 10 co-witnessing acts

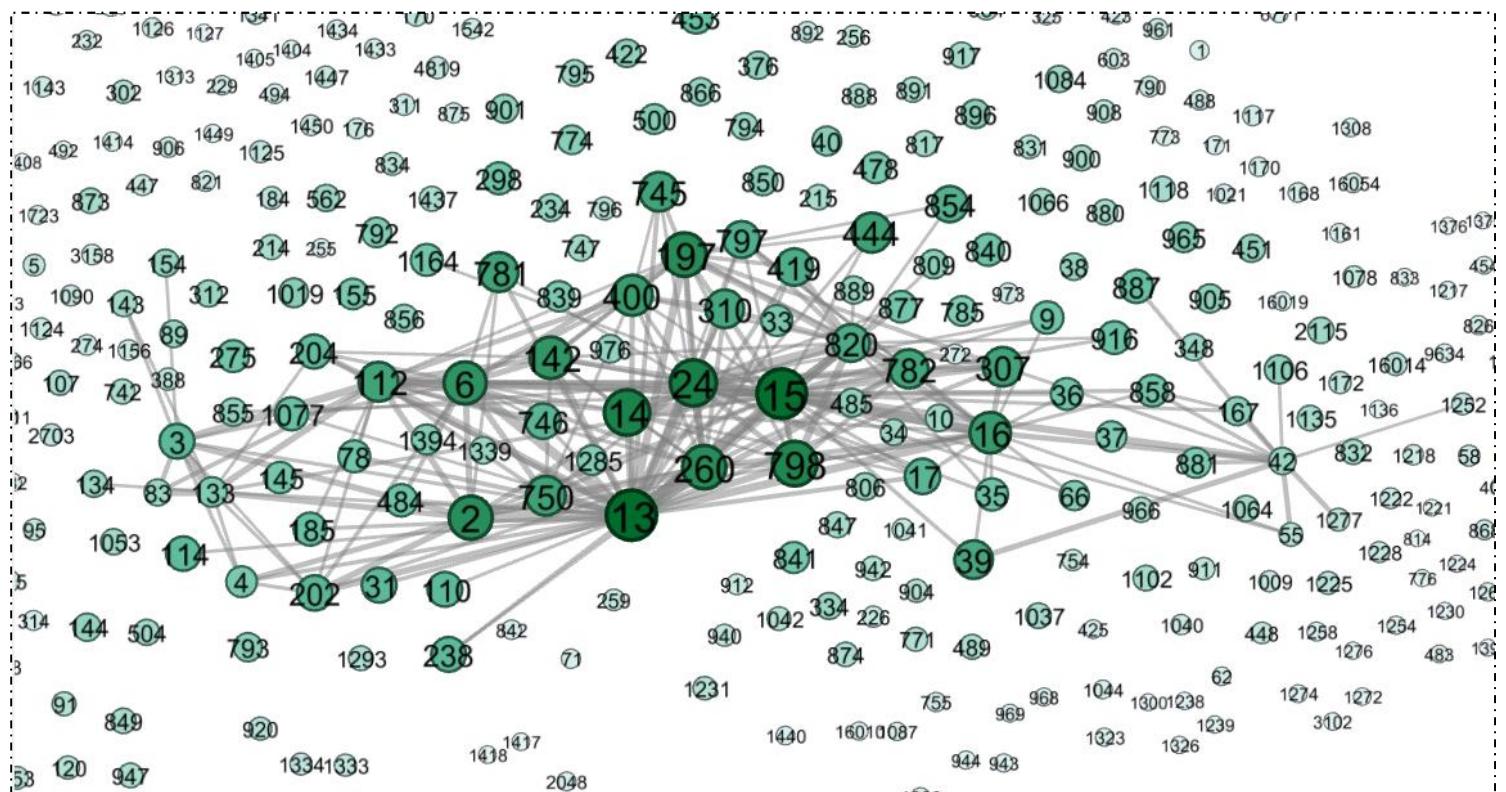


Figure 5.71. Netdraw: William I witnesses, more than 12 co-witnessing acts

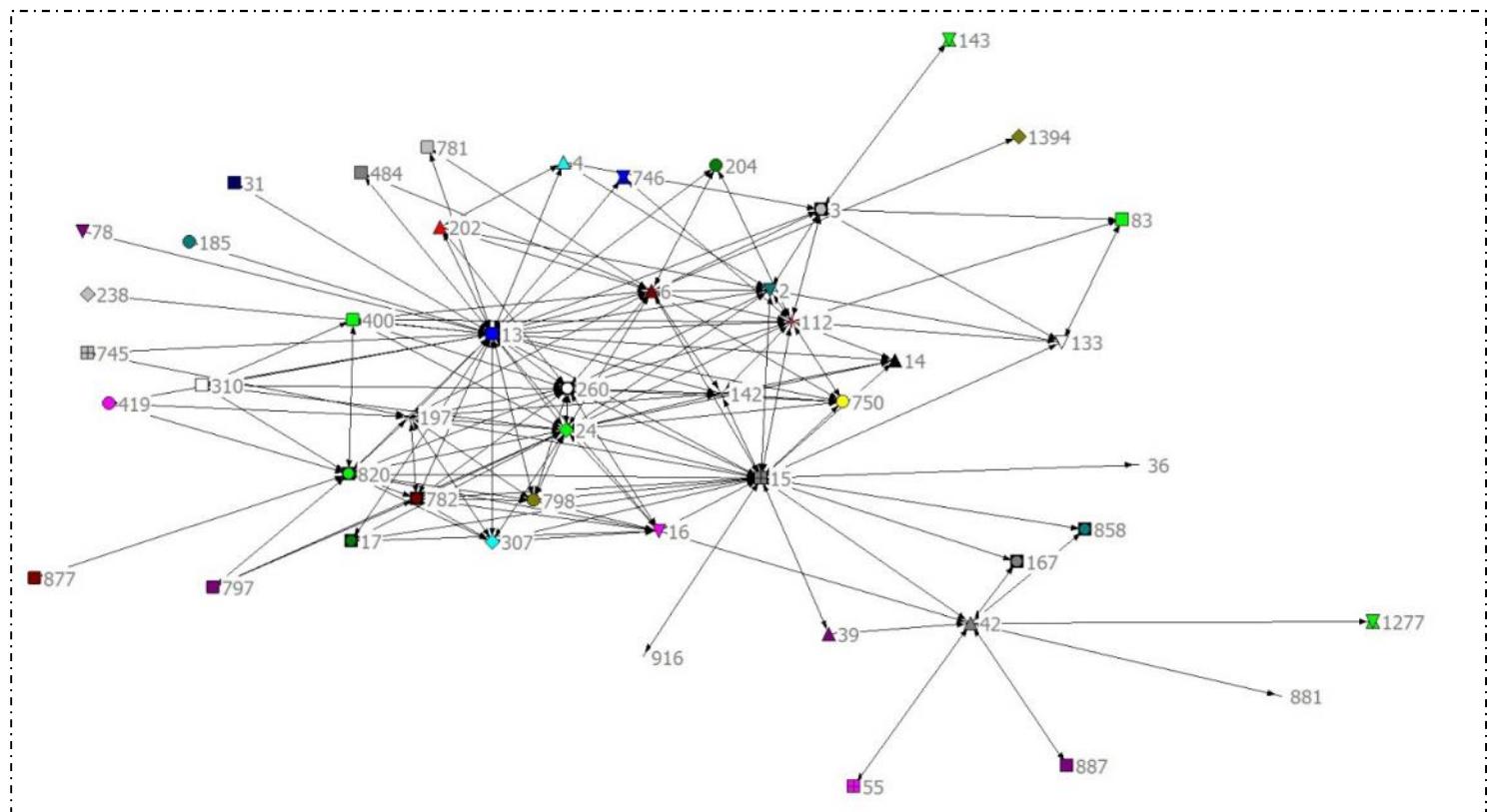


Figure 5.72. Netdraw: William I witnesses, more than 15 co-witnessing acts

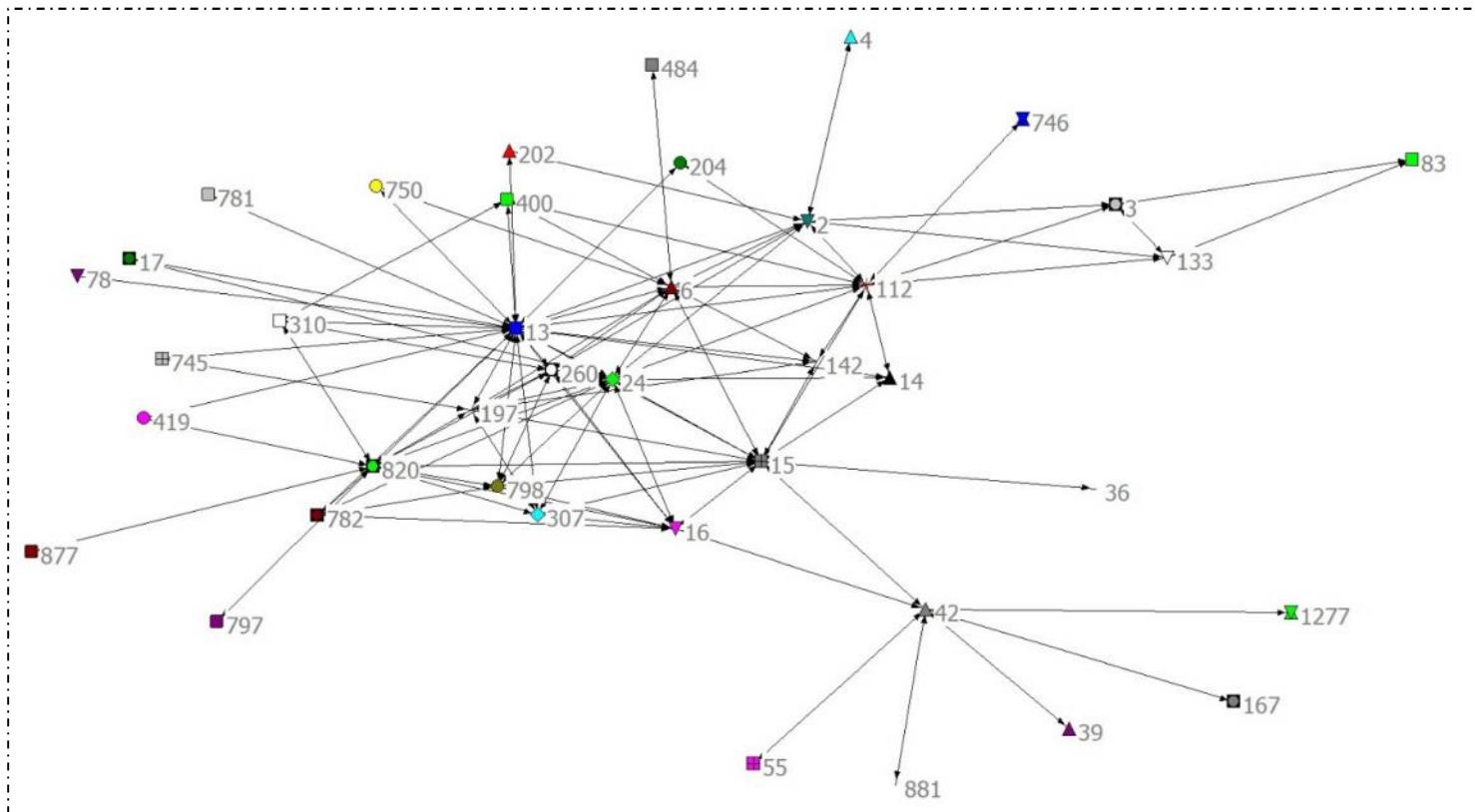


Figure 5.73. Gephi: William I witnesses, more than 15 co-witnessing acts

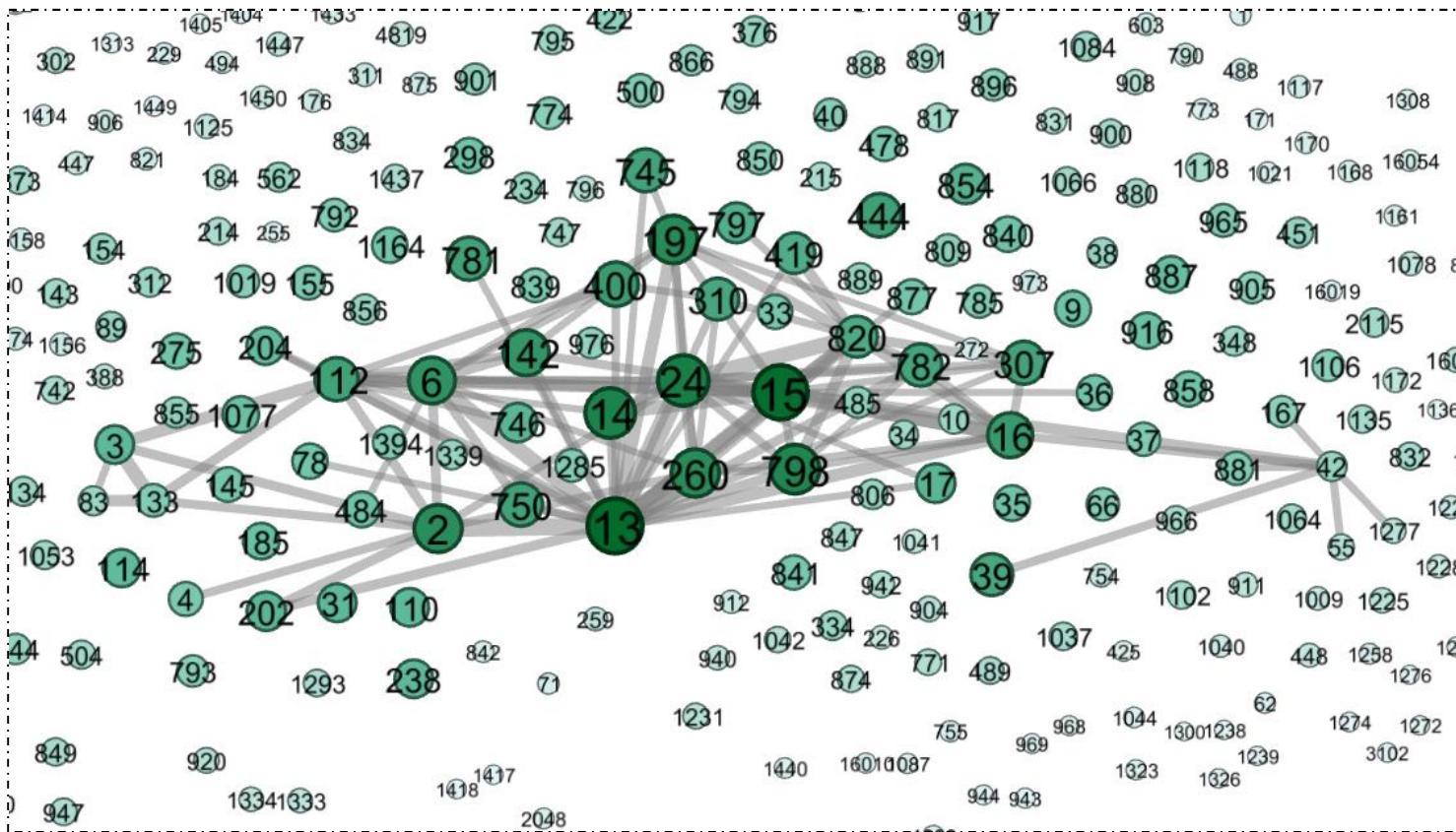


Figure 5.74. Netdraw: William I witnesses, more than 18 co-witnessing acts

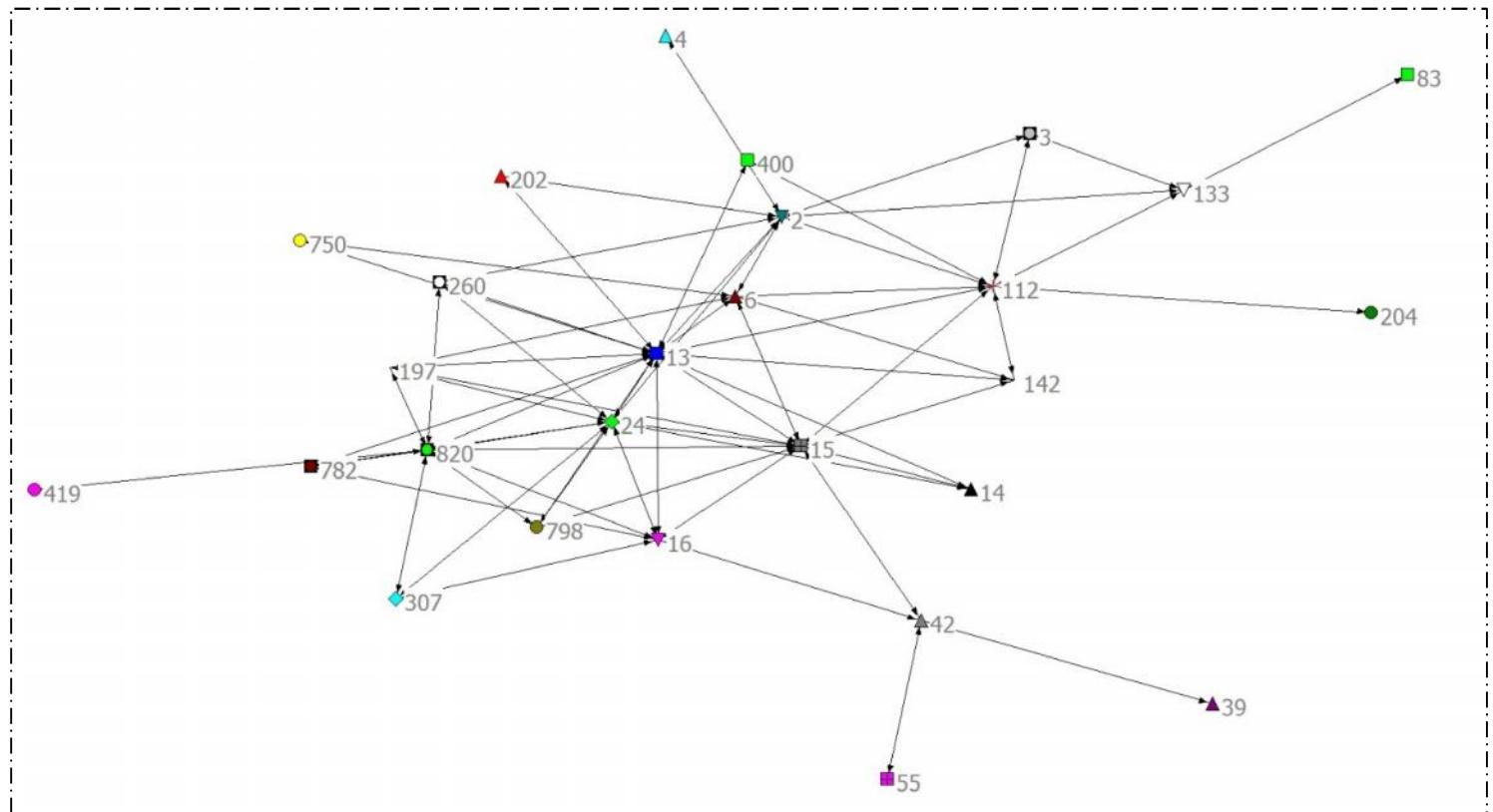


Figure 5.75. Netdraw: William I witnesses, more than 20 co-witnessing acts

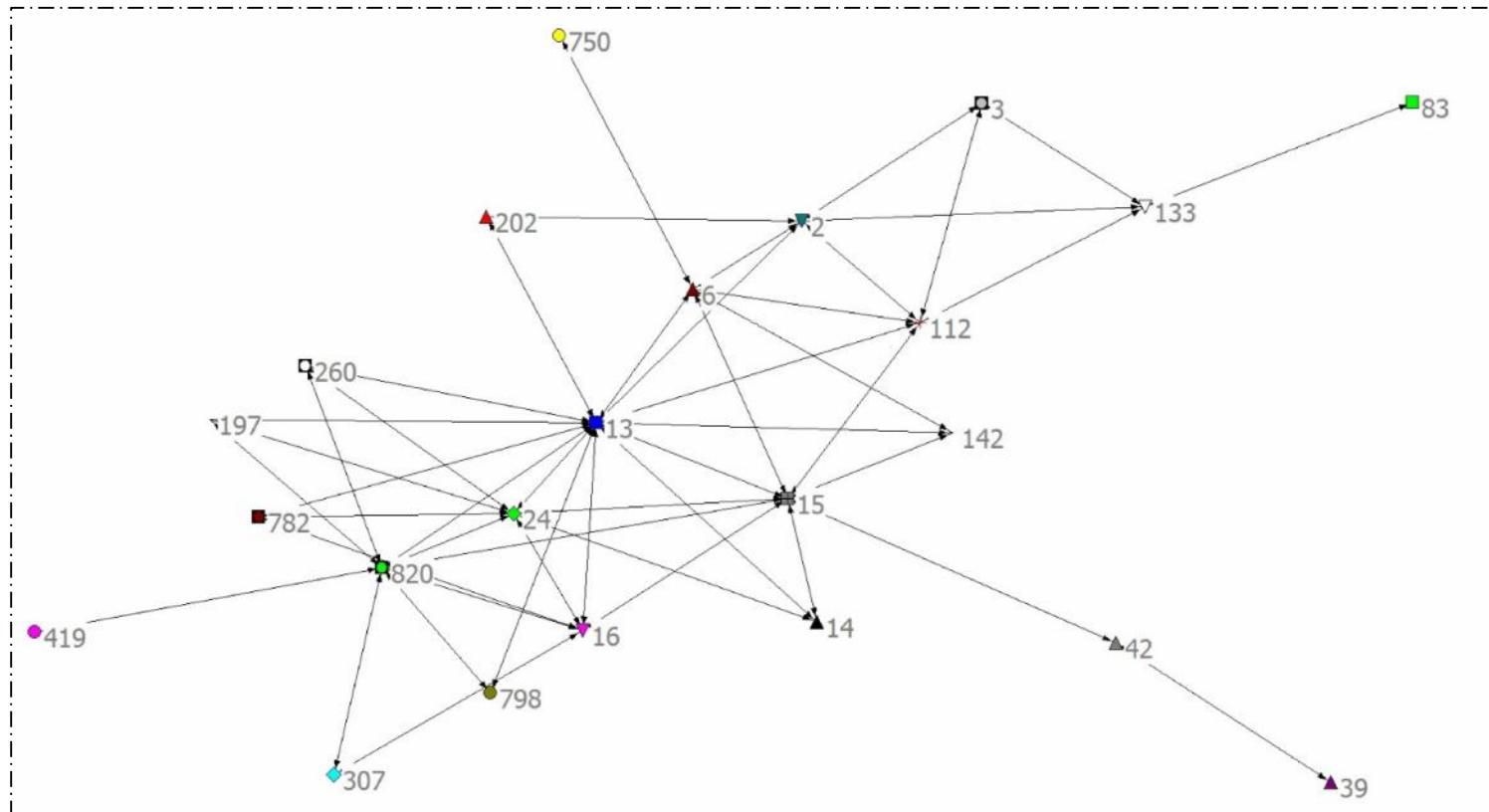


Figure 5.76. Gephi: William I witnesses, more than 20 co-witnessing acts

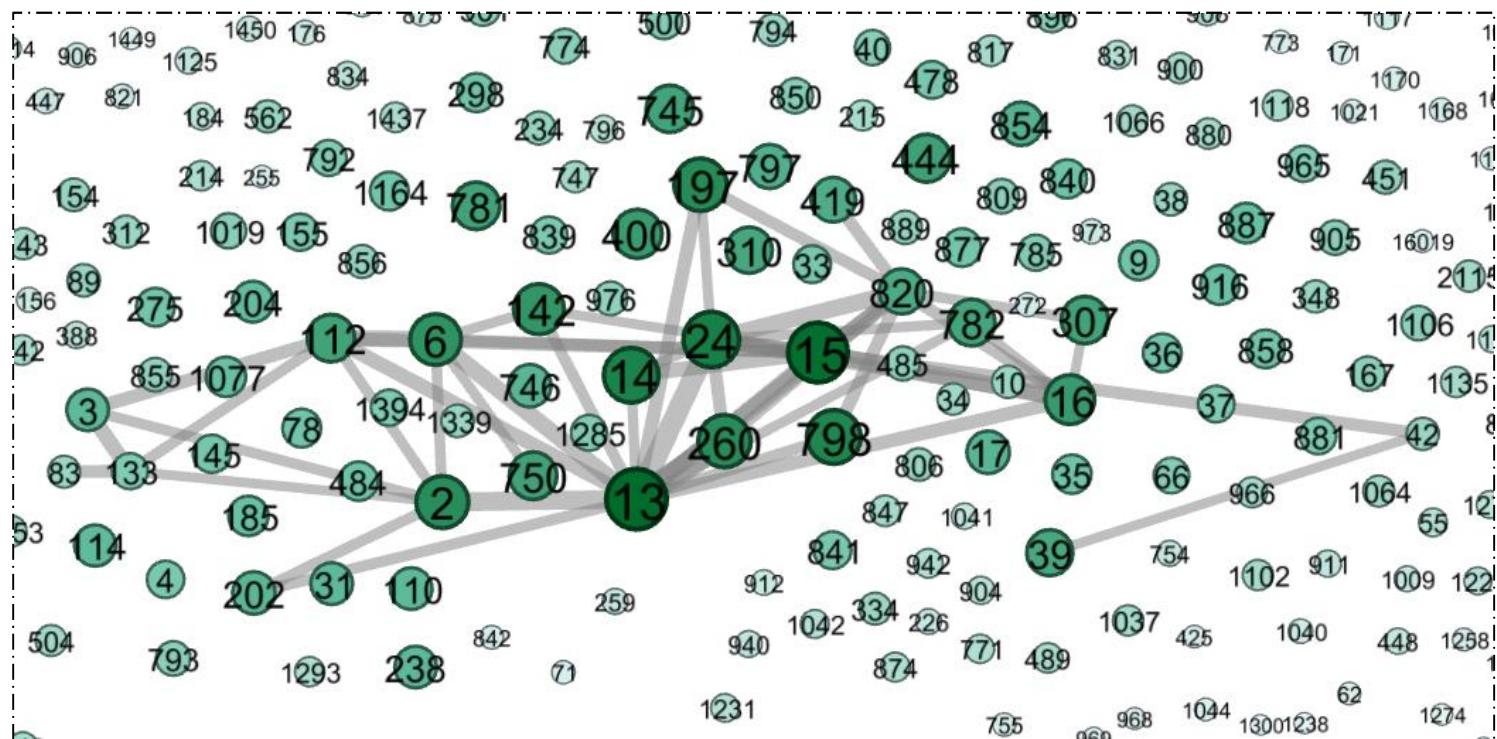


Figure 5.77. Netdraw: William I witnesses, more than 25 co-witnessing acts

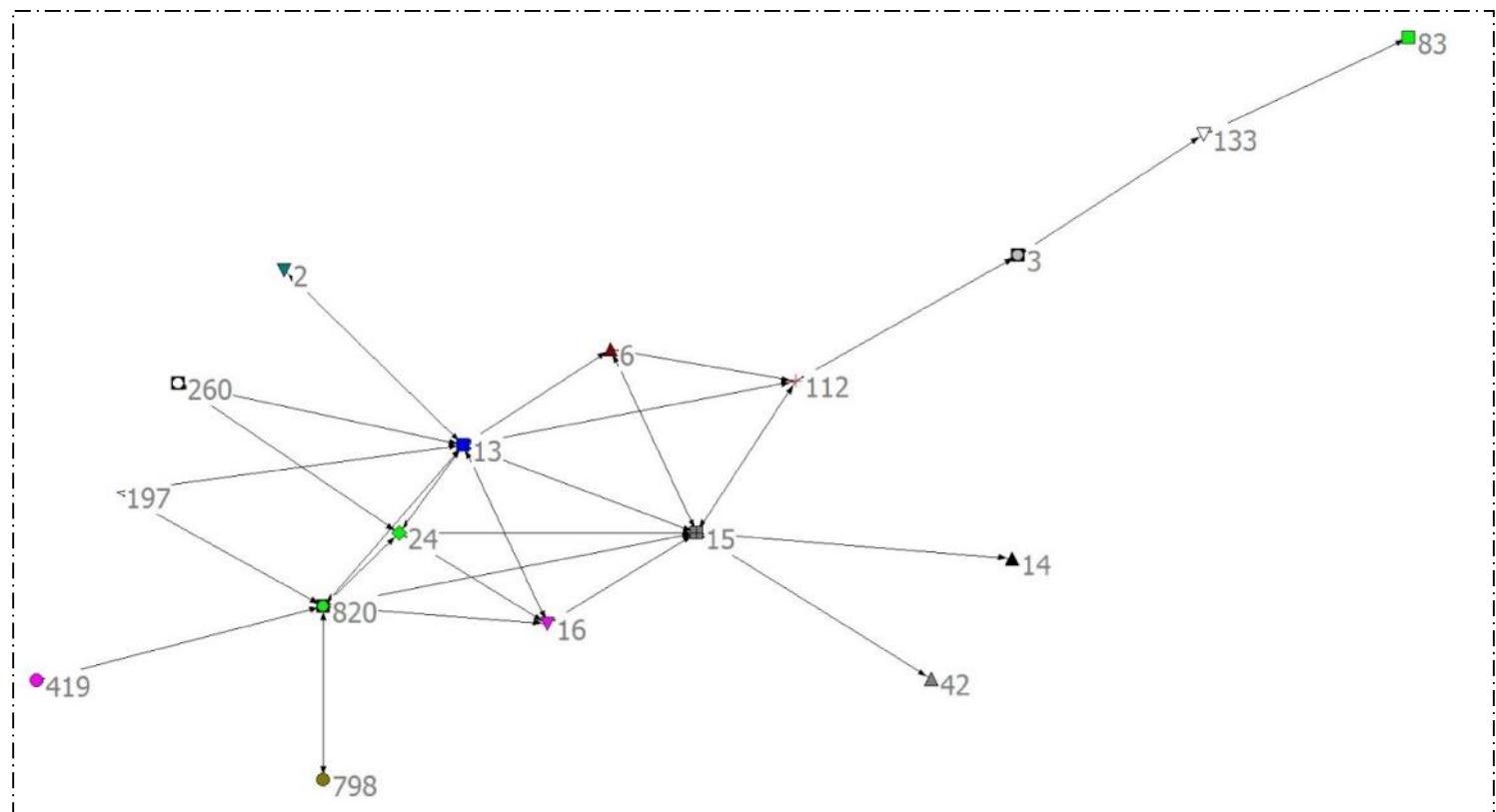


Figure 5.78. Netdraw: William I witnesses, more than 25 co-witnessing acts

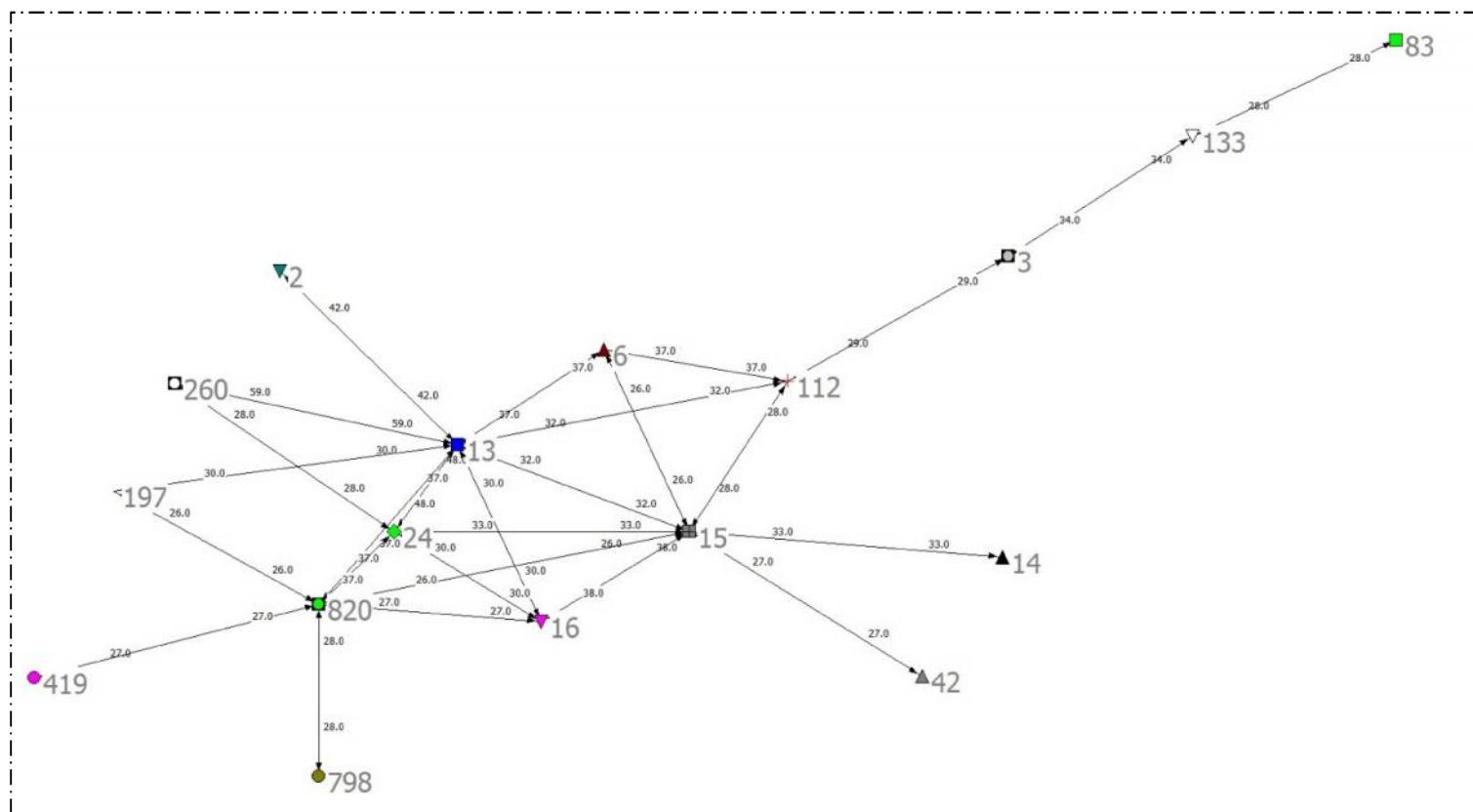


Figure 5.79. Gephi: William I witnesses, more than 25 co-witnessing acts

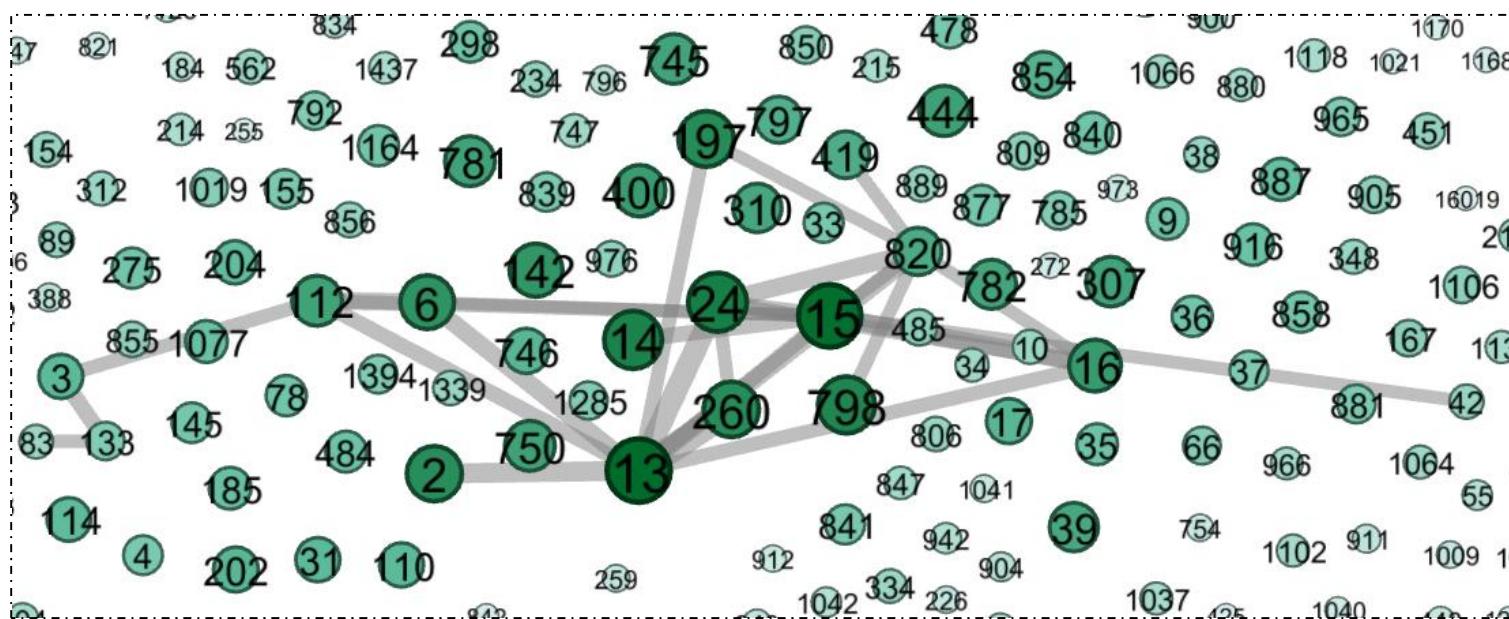


Figure 5.80. Netdraw: William I witnesses, more than 28 co-witnessing acts

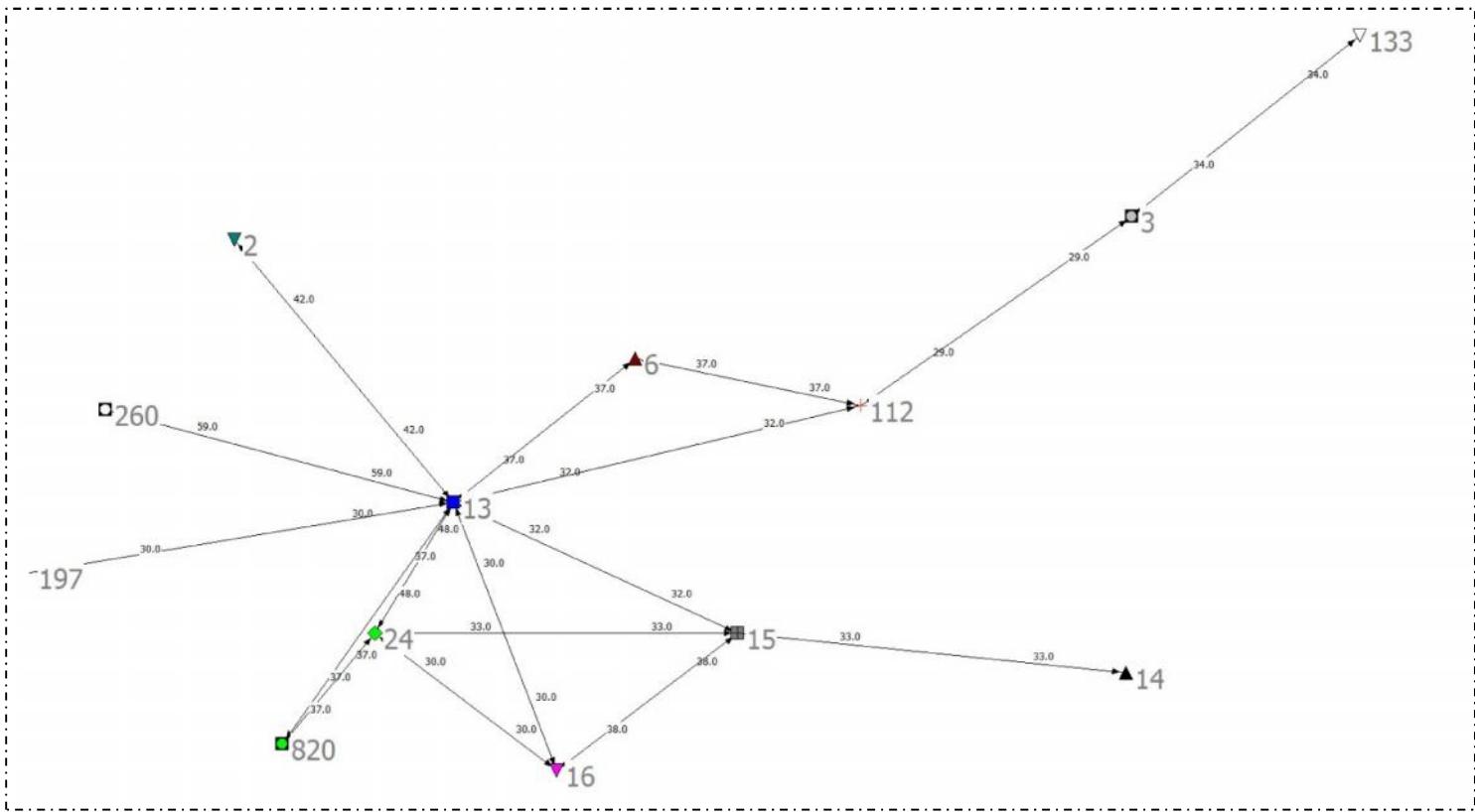


Figure 5.81. Netdraw: William I witnesses, more than 30 co-witnessing acts

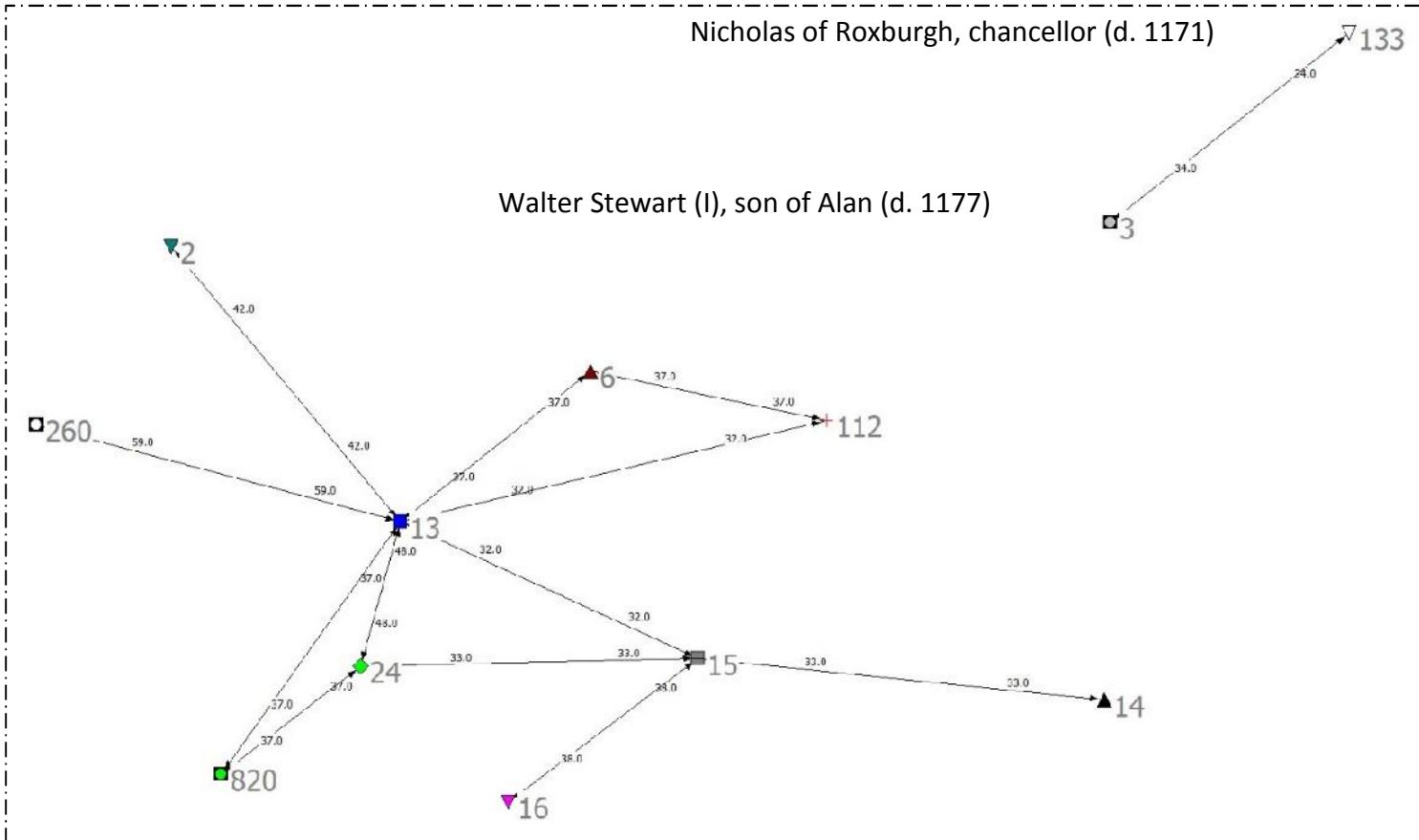


Figure 5.82. Gephi: William I witnesses, more than 30 co-witnessing acts

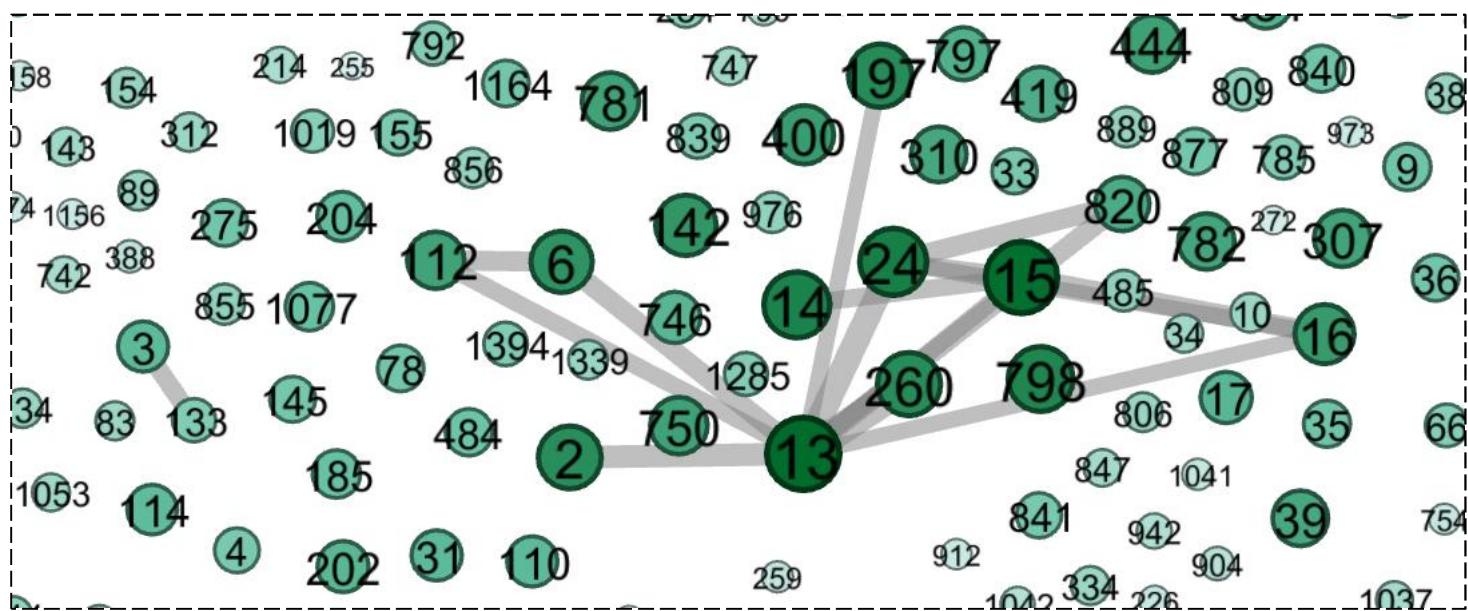


Figure 5.83. Netdraw: William I witnesses, more than 35 co-witnessing acts

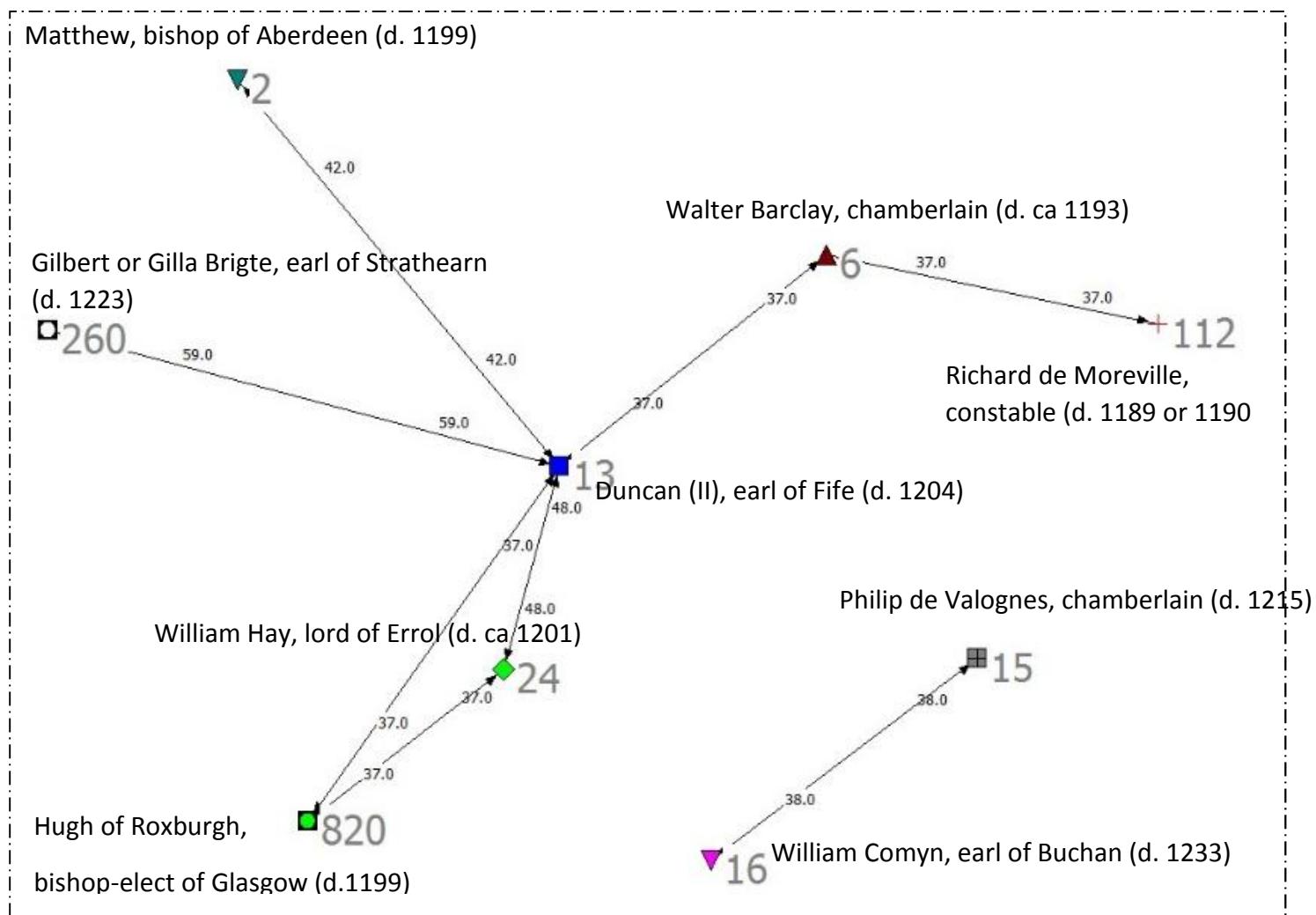


Figure 5.84. Gephi: William I witnesses, more than 35 co-witnessing acts

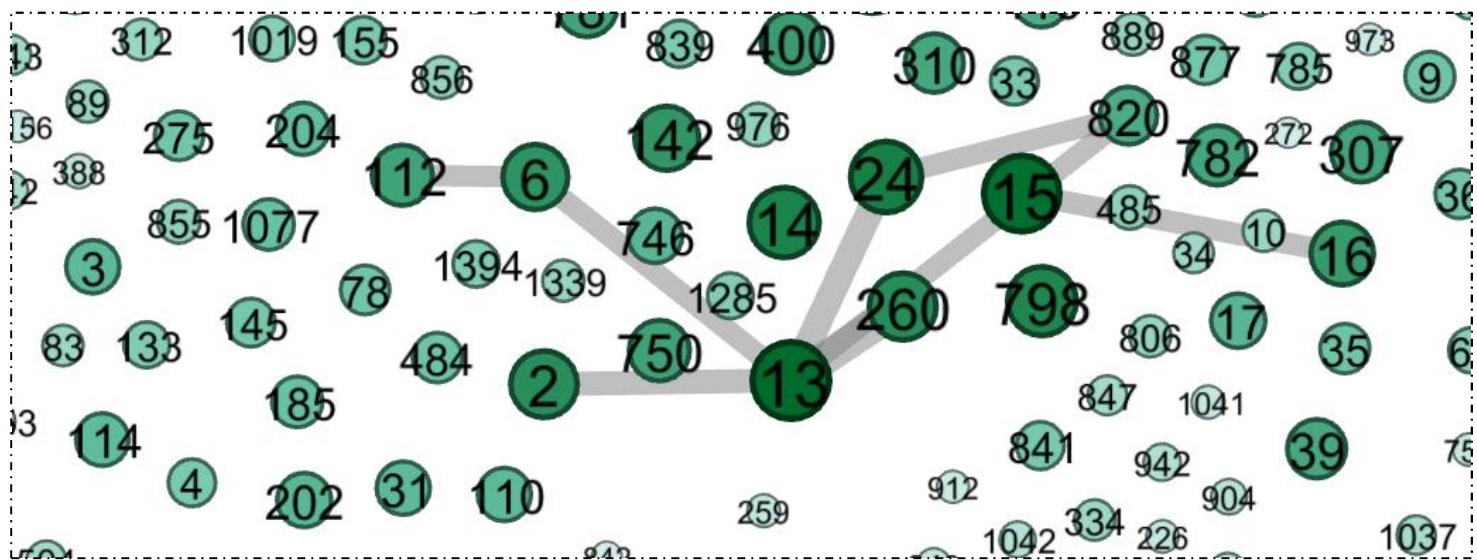


Figure 5.85. Netdraw: William I witnesses, more than 40 co-witnessing acts

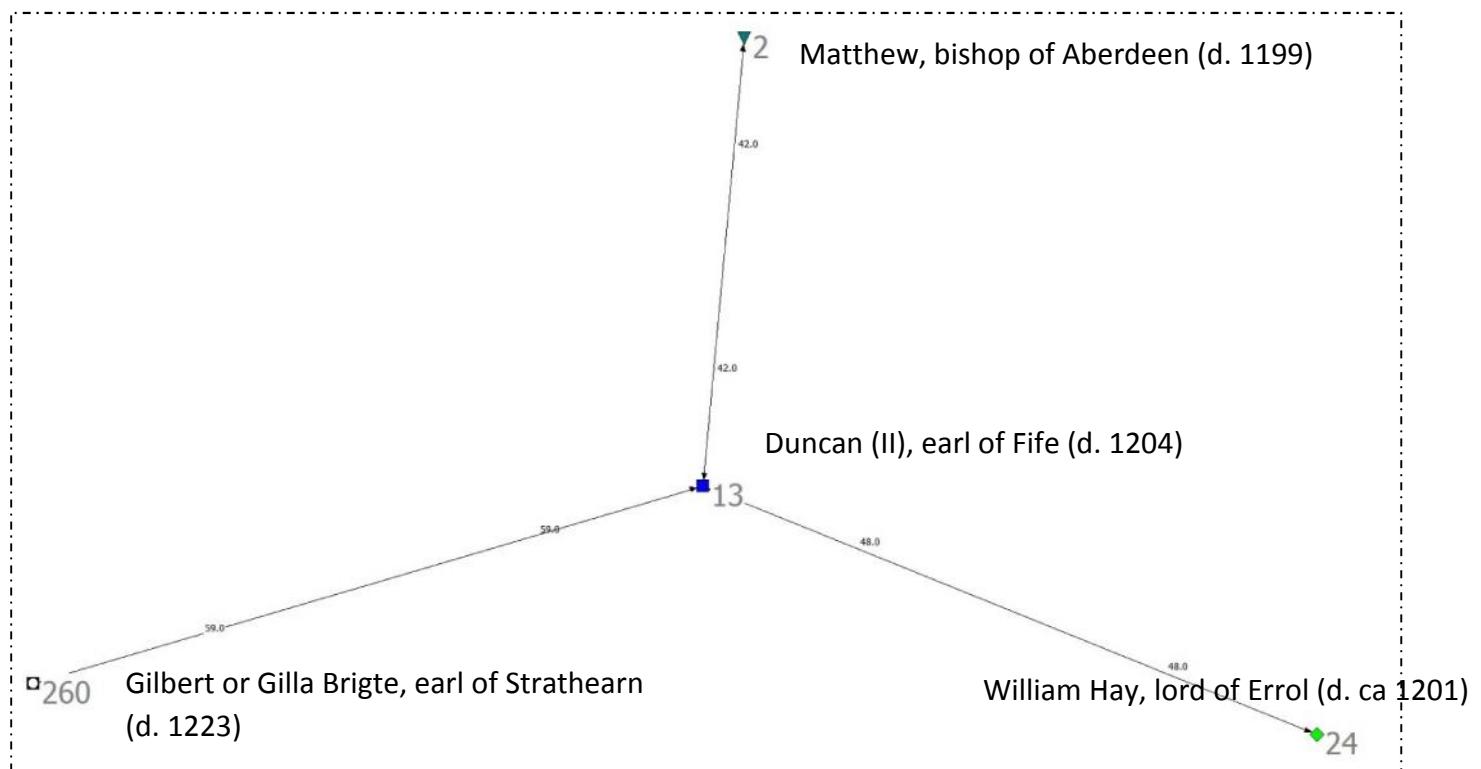


Figure 5.86. Gephi: connections of Philip de Valognes (d. 1215)

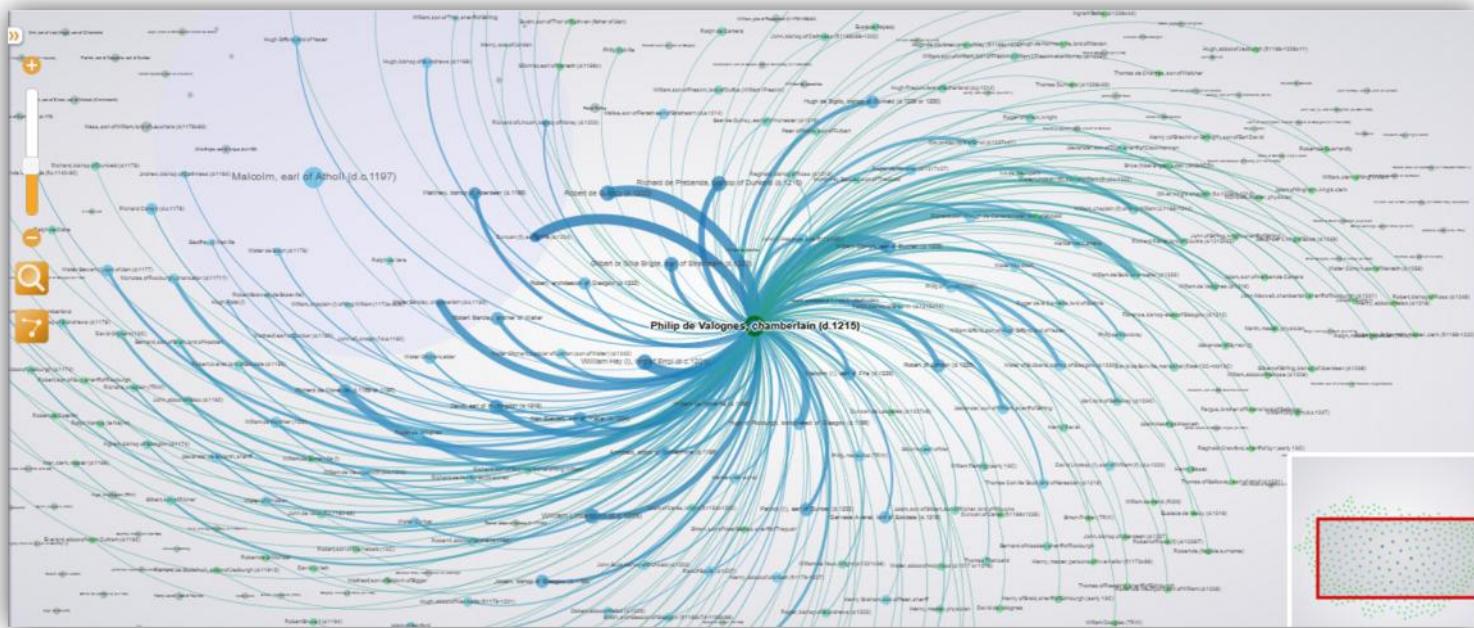


Figure 5.87. Gephi: connections of Duncan (II), earl of Fife (d. 1204)

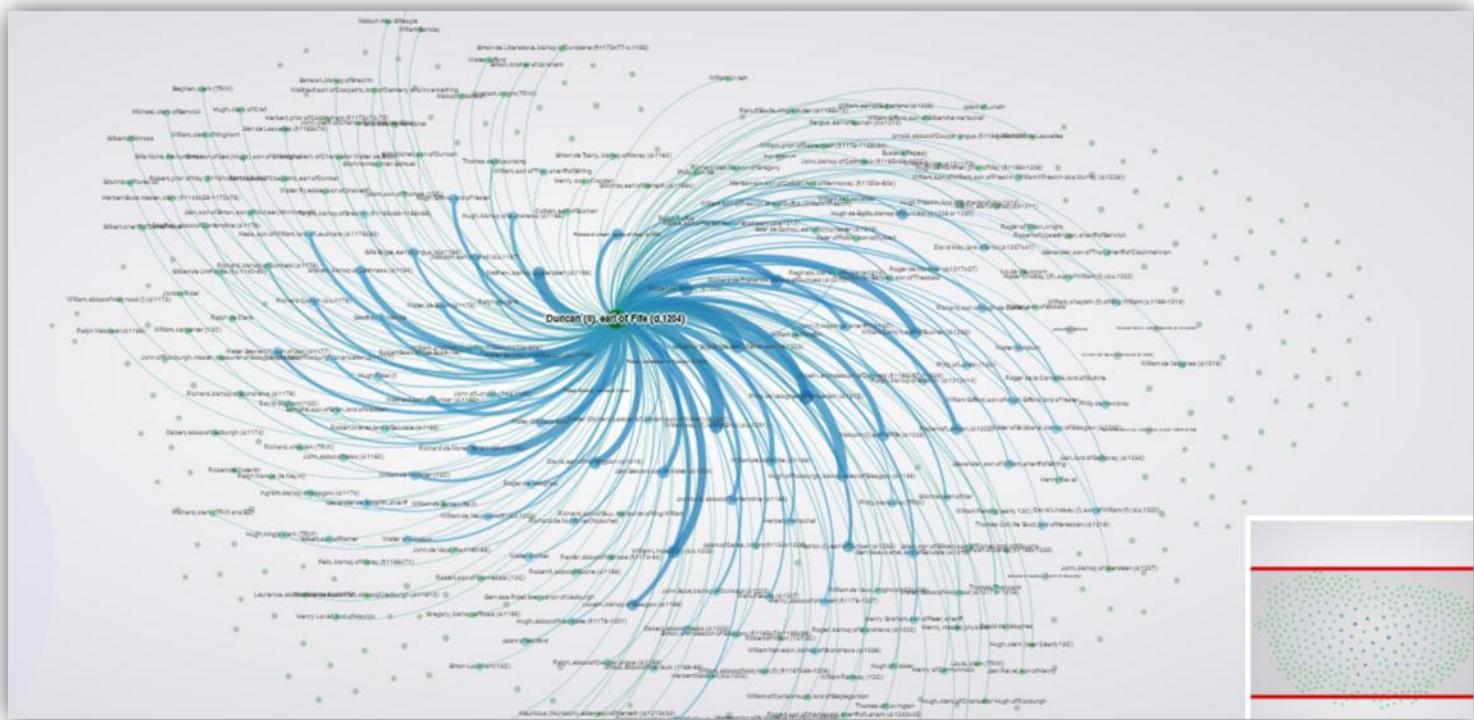


Figure 5.88. Gephi: connections of William Comyn, earl of Buchan (d. 1233)

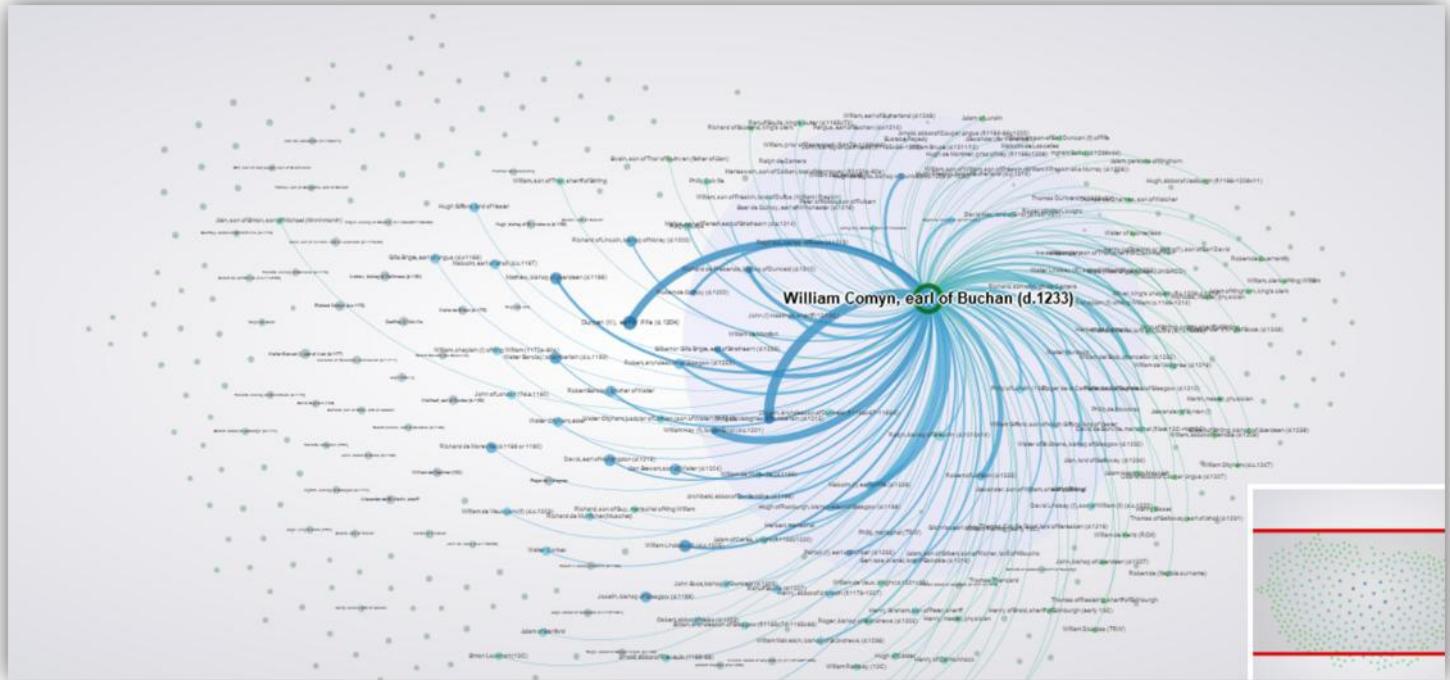


Figure 5.89. Gephi: connections of Walter Barclay, chamberlain (d. ca 1193)

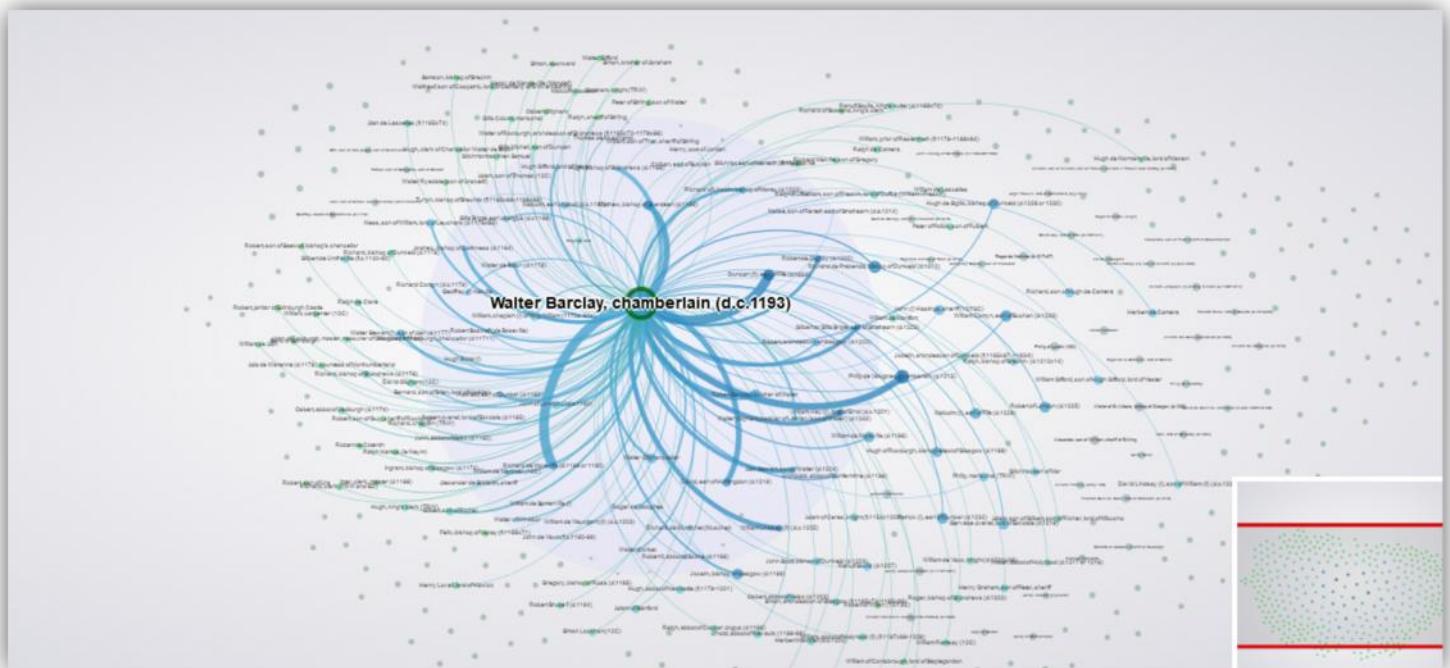


Figure 5.90. Gephi: connections of William del Bois, chancellor (d. 1232)

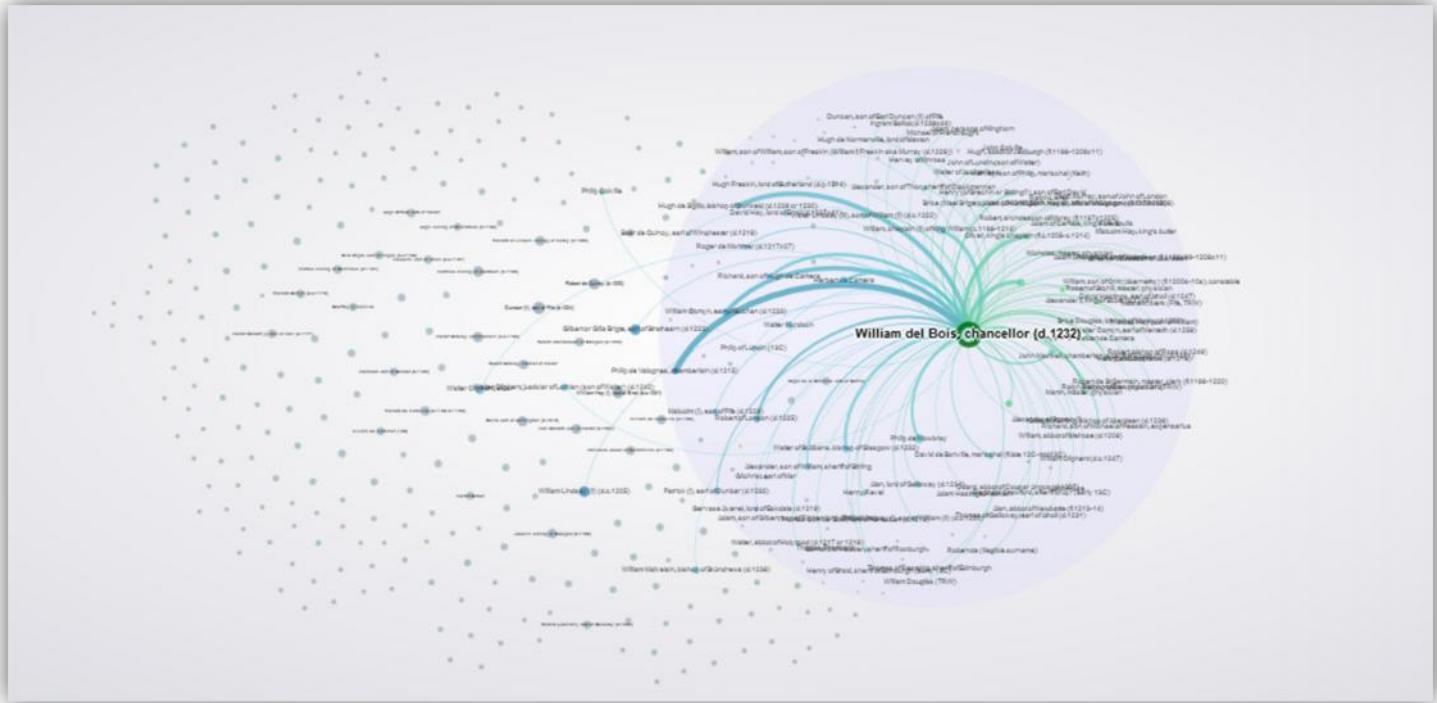


Table 5.25 shows the pair of witnesses who appeared together fifteen or more times in William's documents. Despite the roughly even centrality figures for Duncan (II), earl of Fife, and Philip de Valognes, chamberlain, the former is more prevalent in the most active implicit relationships. Earl Duncan was part of nine of the 16 pairs who witnessed together thirty or more times, while Philip was part of only four of that same group. Earl Duncan witnessed 59 times alongside Gilbert, earl of Strathearn, 48 times with William Hay, lord of Errol, and 42 times with Bishop Matthew of Aberdeen. These were clearly relationships which should be considered significant politically. Similarly, especially in the later part of William's reign, the pair of Philip de Valognes and William Comyn, earl of Buchan, who appeared together on witness lists 38 times, is an implicitly defined relationship which should be considered important.

Table 5.25. Pairs who witnessed together 15 or more times

Person 1	Person 2	Weight
Duncan (II), earl of Fife (d.1204)	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	59
Duncan (II), earl of Fife (d.1204)	William Hay (I), lord of Errol (d.c.1201)	48
Duncan (II), earl of Fife (d.1204)	Matthew, bishop of Aberdeen (d.1199)	42

Philip de Valognes, chamberlain (d.1215)	William Comyn, earl of Buchan (d.1233)	38
Duncan (II), earl of Fife (d.1204)	Walter Barclay, chamberlain (d.c.1193)	37
Duncan (II), earl of Fife (d.1204)	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	37
William Hay (I), lord of Errol (d.c.1201)	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	37
Richard de Moreville (d.1189 or 1190)	Walter Barclay, chamberlain (d.c.1193)	37
Nicholas of Roxburgh, chancellor (d.1171?)	Walter Stewart (I), son of Alan (d.1177)	34
Robert de Quincy (d.1200)	Philip de Valognes, chamberlain (d.1215)	33
Philip de Valognes, chamberlain (d.1215)	William Hay (I), lord of Errol (d.c.1201)	33
Duncan (II), earl of Fife (d.1204)	Philip de Valognes, chamberlain (d.1215)	32
Duncan (II), earl of Fife (d.1204)	Richard de Moreville (d.1189 or 1190)	32
Duncan (II), earl of Fife (d.1204)	William Comyn, earl of Buchan (d.1233)	30
Duncan (II), earl of Fife (d.1204)	William Lindsay (II) (d.c.1205)	30
William Comyn, earl of Buchan (d.1233)	William Hay (I), lord of Errol (d.c.1201)	30
Richard de Moreville (d.1189 or 1190)	Walter Stewart (I), son of Alan (d.1177)	29
Philip de Valognes, chamberlain (d.1215)	Richard de Moreville (d.1189 or 1190)	28
William Hay (I), lord of Errol (d.c.1201)	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	28
Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	Richard de Prebenda, bishop of Dunkeld (d.1210)	28
Nicholas of Roxburgh, chancellor (d.1171?)	David Oliphant (12C)	28
Philip de Valognes, chamberlain (d.1215)	William del Bois, chancellor (d.1232)	27
William Comyn, earl of Buchan (d.1233)	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	27
Archibald, abbot of Dunfermline (d.1198)	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	27
Philip de Valognes, chamberlain (d.1215)	Walter Barclay, chamberlain (d.c.1193)	26
Philip de Valognes, chamberlain (d.1215)	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	26
William Lindsay (II) (d.c.1205)	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	26
Duncan (II), earl of Fife (d.1204)	Richard de Prebenda, bishop of Dunkeld (d.1210)	25
Duncan (II), earl of Fife (d.1204)	David, earl of Huntingdon (d.1219)	25
Duncan (II), earl of Fife (d.1204)	Andrew, bishop of Caithness (d.1184)	24
Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	Andrew, bishop of Caithness (d.1184)	24
Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	24
Richard de Moreville (d.1189 or 1190)	Nicholas of Roxburgh, chancellor (d.1171?)	24
Robert de Quincy (d.1200)	William Hay (I), lord of Errol (d.c.1201)	23
Matthew, bishop of Aberdeen (d.1199)	Richard de Moreville (d.1189 or 1190)	23
Matthew, bishop of Aberdeen (d.1199)	Walter Barclay, chamberlain (d.c.1193)	23
Matthew, bishop of Aberdeen (d.1199)	Walter Stewart (I), son of Alan (d.1177)	23
Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	Robert of London (d.1225)	23
Duncan (II), earl of Fife (d.1204)	Robert de Quincy (d.1200)	22
Duncan (II), earl of Fife (d.1204)	Malcolm (I), earl of Fife (d.1229)	22

William Hay (I), lord of Errol (d.c.1201)	William Lindsay (II) (d.c.1205)	22
William Hay (I), lord of Errol (d.c.1201)	Malcolm (I), earl of Fife (d.1229)	22
Robert Barclay, brother of Walter	Walter Barclay, chamberlain (d.c.1193)	22
Walter Barclay, chamberlain (d.c.1193)	David, earl of Huntingdon (d.1219)	22
Philip de Valognes, chamberlain (d.1215)	David, earl of Huntingdon (d.1219)	21
William Comyn, earl of Buchan (d.1233)	Robert of London (d.1225)	21
William Comyn, earl of Buchan (d.1233)	Malcolm (I), earl of Fife (d.1229)	21
Hugh de Sigillo, bishop of Dunkeld (d.1229 or 1230)	William del Bois, chancellor (d.1232)	21
Matthew, bishop of Aberdeen (d.1199)	Nicholas of Roxburgh, chancellor (d.1171?)	21
Duncan (II), earl of Fife (d.1204)	Robert Barclay, brother of Walter	20
Philip de Valognes, chamberlain (d.1215)	Richard de Prebenda, bishop of Dunkeld (d.1210)	20
William Comyn, earl of Buchan (d.1233)	William del Bois, chancellor (d.1232)	20
William Hay (I), lord of Errol (d.c.1201)	Richard de Prebenda, bishop of Dunkeld (d.1210)	20
Matthew, bishop of Aberdeen (d.1199)	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	20
Matthew, bishop of Aberdeen (d.1199)	Ness, son of William, lord of Leuchars (d.1178x83)	20
Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	Malcolm (I), earl of Fife (d.1229)	20
Duncan (II), earl of Fife (d.1204)	William Lindsay (II) (d.c.1205)	19
Philip de Valognes, chamberlain (d.1215)	William Lindsay (II) (d.c.1205)	19
William Hay (I), lord of Errol (d.c.1201)	Matthew, bishop of Aberdeen (d.1199)	19
William Hay (I), lord of Errol (d.c.1201)	Robert of London (d.1225)	19
Richard de Moreville (d.1189 or 1190)	Alan Stewart, son of Walter (d.1204)	19
Richard de Moreville (d.1189 or 1190)	David, earl of Huntingdon (d.1219)	19
Richard de Moreville (d.1189 or 1190)	Waltheof, earl of Dunbar (d.1182)	19
William Lindsay (II) (d.c.1205)	Walter Barclay, chamberlain (d.c.1193)	19
William del Bois, chancellor (d.1232)	Richard Revel, lord of Coultra (d.1215x25)	19
Duncan (II), earl of Fife (d.1204)	William de Moreville (d.1196)	18
William Comyn, earl of Buchan (d.1233)	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	18
William Hay (I), lord of Errol (d.c.1201)	Richard de Moreville (d.1189 or 1190)	18
William Hay (I), lord of Errol (d.c.1201)	Walter Barclay, chamberlain (d.c.1193)	18
Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	William Lindsay (II) (d.c.1205)	18
Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	Richard de Prebenda, bishop of Dunkeld (d.1210)	18
William de Moreville (d.1196)	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	18
William Lindsay (II) (d.c.1205)	David, earl of Huntingdon (d.1219)	18
Walter Stewart (I), son of Alan (d.1177)	David Oliphant (12C)	18
William del Bois, chancellor (d.1232)	Oliver, king's chaplain (fl.c.1208-c.1214)	18
Duncan (II), earl of Fife (d.1204)	John (I) Hastings, sheriff (12/13C)	17
Duncan (II), earl of Fife (d.1204)	Jocelin, bishop of Glasgow (d.1199)	17
Duncan (II), earl of Fife (d.1204)	Richard of Lincoln, bishop of Moray (d.1203)	17
Duncan (II), earl of Fife (d.1204)	Waltheof, earl of Dunbar (d.1182)	17
Duncan (II), earl of Fife (d.1204)	Walter de Bidun (d.1178)	17

Philip de Valognes, chamberlain (d.1215)	Robert of London (d.1225)	17
Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	William de Moreville (d.1196)	17
Richard de Moreville (d.1189 or 1190)	Walter Oliphant, elder	17
Robert, archdeacon of Glasgow (d.1222)	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	17
William de Moreville (d.1196)	Alan Stewart, son of Walter (d.1204)	17
Alan Stewart, son of Walter (d.1204)	Walter Barclay, chamberlain (d.c.1193)	17
Hugh, bishop of St Andrews (d.1188)	Walter Barclay, chamberlain (d.c.1193)	17
Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	Herbert, marischal	17
Richard de Prebenda, bishop of Dunkeld (d.1210)	Malcolm (I), earl of Fife (d.1229)	17
William, chaplain (II) of King William (c.1196-1214)	William del Bois, chancellor (d.1232)	17
Duncan (II), earl of Fife (d.1204)	Archibald, abbot of Dunfermline (d.1198)	16
Duncan (II), earl of Fife (d.1204)	Robert of London (d.1225)	16
Robert de Quincy (d.1200)	Richard de Moreville (d.1189 or 1190)	16
Philip de Valognes, chamberlain (d.1215)	Philip of Lundin (13C)	16
William Comyn, earl of Buchan (d.1233)	Richard de Prebenda, bishop of Dunkeld (d.1210)	16
John (I) Hastings, sheriff (12/13C)	William Hay (I), lord of Errol (d.c.1201)	16
Jocelin, bishop of Glasgow (d.1199)	William Lindsay (II) (d.c.1205)	16
Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	Walter Barclay, chamberlain (d.c.1193)	16
William Lindsay (II) (d.c.1205)	Robert of London (d.1225)	16
Herbert de Camera	William del Bois, chancellor (d.1232)	16
Duncan (II), earl of Fife (d.1204)	Hugh, bishop of St Andrews (d.1188)	15
Duncan (II), earl of Fife (d.1204)	Ness, son of William, lord of Leuchars (d.1178×83)	15
Philip de Valognes, chamberlain (d.1215)	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	15
Philip de Valognes, chamberlain (d.1215)	Robert Barclay, brother of Walter	15
Philip de Valognes, chamberlain (d.1215)	Walter of St Albans, bishop of Glasgow (d.1232)	15
Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	Malcolm (I), earl of Fife (d.1229)	15
Richard de Moreville (d.1189 or 1190)	Robert Barclay, brother of Walter	15
Richard de Moreville (d.1189 or 1190)	David Oliphant (12C)	15
Archibald, abbot of Dunfermline (d.1198)	William Lindsay (II) (d.c.1205)	15
Walter Barclay, chamberlain (d.c.1193)	Andrew, bishop of Caithness (d.1184)	15
Robert of London (d.1225)	Malcolm (I), earl of Fife (d.1229)	15
Richard, son of Hugh de Camera	William del Bois, chancellor (d.1232)	15

## ALEXANDER II (1214-49)

The study of the witnesses to the documents of King Alexander II (1214-49) included 277 documents out of a potential 305 (28 of the five specified document types did not have witnesses). Two were notifications, 3 were charter/brieves, and 272 were charters strictly speaking. Three additional Alexander II documents were added after Oct. 2014 and this study reflects these updates. There were 286 witnesses, all men, in the study, with 3375 edges.

Table 5.26. Top 15 witnesses to Alexander II charters by degree

Rank	PoMS ID	Name	Degree	Eigenvector
1	1357	Walter Comyn, earl of Menteith (d.1258)	144	1
2	1285	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	129	0.929195
3	1378	Walter Stewart (II), son of Alan (d.1241)	124	0.891477
4	1281	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	116	0.879446
5	2068	Walter Bisset (13C)	114	0.807291
6	1420	Henry Balliol (d.1246)	113	0.817432
7	1389	John Hay (I), lord of Naughton (d.xOct.1266)	108	0.857484
8	1135	David de Bonville, marischal (fl.late 12C-mid13C)	106	0.835464
9	52	Thomas of Stirling, clerk, archdeacon of Glasgow (d.1227)	105	0.771756
10	435	William of Bondington, bishop of Glasgow (d.1258)	102	0.718078
11	16	William Comyn, earl of Buchan (d.1233)	91	0.71019
12	42	William del Bois, chancellor (d.1232)	88	0.621706
13	62	Ingram Balliol (d.1239x44)	85	0.745639
14	3998	Robert, king's chaplain (TRA2)	81	0.679059
15	2039	Geoffrey de Liberatione, bishop of Dunkeld (d.1249)	80	0.640013

Table 5.27. Comparison of centrality by eigenvector versus degree

Rank	PoMS ID	Name	Eigenvector Centrality	%	Degree	Degree rank
1	1357	Walter Comyn, earl of Menteith (d.1258)	1	100	144	1
2	1285	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	0.929195	92.9	129	2
3	1378	Walter Stewart (II), son of Alan (d.1241)	0.891477	89.1	124	3
4	1281	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	0.879446	87.9	116	4
5	1389	John Hay (I), lord of Naughton (d.xOct.1266)	0.857484	85.7	108	7

<b>6</b>	1135	David de Bonville, marischal (fl. late 12C-mid13C)	0.835464	83.5	106		<b>8</b>
<b>7</b>	1420	Henry Balliol (d.1246)	0.817432	81.7	113		<b>6</b>
<b>8</b>	2068	Walter Bisset (13C)	0.807291	80.1	114		<b>5</b>
<b>9</b>	52	Thomas of Stirling, clerk, archdeacon of Glasgow (d.1227)	0.771756	77.2	105		<b>9</b>
<b>10</b>	62	Ingram Balliol (d.1239x44)	0.745639	74.6	85		<b>13</b>
<b>11</b>	435	William of Bondington, bishop of Glasgow (d.1258)	0.718078	71.8	102		<b>10</b>
<b>12</b>	16	William Comyn, earl of Buchan (d.1233)	0.71019	71	91		<b>11</b>
<b>13</b>	1106	Philip de Mowbray	0.692652	69.3	78		<b>17</b>
<b>14</b>	1318	Thomas Hay (son of William)	0.691801	69.2	79		<b>16</b>
<b>15</b>	3998	Robert, king's chaplain (TRA2)	0.679059	67.9	81		<b>14</b>

Table 5.28. Top 15 witnesses to Alexander II charters by betweenness

Rank	PoMS ID	Name	Betweenness
<b>1</b>	1357	Walter Comyn, earl of Menteith (d.1258)	3634.115
<b>2</b>	1378	Walter Stewart (II), son of Alan (d.1241)	2598.392
<b>3</b>	2068	Walter Bisset (13C)	2360.091
<b>4</b>	1285	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	2276.78
<b>5</b>	1420	Henry Balliol (d.1246)	2189.079
<b>6</b>	435	William of Bondington, bishop of Glasgow (d.1258)	1948.866
<b>7</b>	1281	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	1800.079
<b>8</b>	52	Thomas of Stirling, clerk, archdeacon of Glasgow (d.1227)	1682.331
<b>9</b>	1135	David de Bonville, marischal (fl. late 12C-mid13C)	1592.773
<b>10</b>	1389	John Hay (I), lord of Naughton (d.xOct.1266)	1589.782
<b>11</b>	2065	<b>Robert Menzies (d.1267)</b>	1525.06
<b>12</b>	2039	Geoffrey de Liberatione, bishop of Dunkeld (d.1249)	1259.894
<b>13</b>	42	William del Bois, chancellor (d.1232)	1161.38
<b>14</b>	1971	<b>Alan Durward (d.1275)</b>	1082.443
<b>15</b>	4425	<b>William Lindsay (IV), son of Walter (III) (d.c.1247)</b>	1008.765

Table 5.29. Top players and their positions (churchmen in italics)

Name	Poms Id	Position
Walter Comyn, earl of Menteith (d.1258)	1357	
Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	1285	Justiciar of Lothian, ca 1215 - 1242
Walter Stewart (II), son of Alan (d.1241)	1378	Justiciar of Scotia, 1232 – 1241
John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	1281	Chamberlain, ca 1231 – 1233 Sheriff of Berwick, Sheriff of Roxburgh
Walter Bisset (13C)	2068	
Henry Balliol (d.1246)	1420	Chamberlain, ca 1223 – ca 1230; ca 1241 – ca 1246
John Hay (I), lord of Naughton (d.xOct.1266)	1389	Sheriff of Fife, sheriff of Perth
David de Bonville, marischal (fl.late 12C-mid13C)	1135	King's marischal
<i>Thomas of Stirling, clerk, archdeacon of Glasgow (d.1227)</i>	52	Chancellor, ca 1226 – ca 1227
<i>William of Bondington, bishop of Glasgow (d.1258)</i>	435	Chancellor, ca 1231 – ca 1249
William Comyn, earl of Buchan (d.1233)	16	Justiciar, ca 1205 – ca 1232
<i>William del Bois, chancellor (d.1232)</i>	42	Chancellor, 1211 – ca 1224
Ingram Balliol (d.1239x44)	62	Sheriff of Berwick
<i>Robert, king's chaplain (TRA2)</i>	3998	King's chaplain
<i>Geoffrey de Liberatione, bishop of Dunkeld (d.1249)</i>	2039	King's clerk of the livery
Alan Durward (d. 1275)	1971	King's doorward/ usher; justiciar of Scotia, 1244-51

Analysis of the top players in the reign of Alexander II serves as a good reminder that while the most important actors often held household offices and other administrative positions, these in and of themselves were not determinative of a key position of power. In the case of royal justices and justiciars in particular, it is likely that the job followed the position of power rather than the other way round. The three most powerful men among the witnesses of Alexander II's charters were [1357] Walter Comyn, earl of Menteith (d.1258), son of [16] William Comyn, earl of Buchan (d. 1233), who appears in the top slot in all three centrality rankings. [1285] Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242) was second in both degree and eigenvector, while [1378] Walter Stewart (II), son of Alan (d.1241) was third. Oliphant and Stewart had eigenvector scores of about 93% and 89% of Walter Comyn's, respectively. The significance of Oliphant and Stewart seems to rest in, or be reflected by, their positions as justiciars of Lothian and Scotia, although the former held this office for much longer. Walter Comyn, earl of Menteith, however, held neither household office nor justiciarship: this looks like a remarkable step-change. The most central individuals in previous reigns had always been either constables or stewards, or else royal justices, like Duncan (II), earl of Fife, or William Comyn, earl of

Buchan. But it is more likely that offices and positions such as these merely tended to accrue themselves to the men with the most power. The role of justice (or justiciar by about 1222) gave the bearer viceregal powers, however, so it is remarkable that Walter Comyn did not hold this position upon his father's death. Nevertheless, Walter Comyn attained an unassailable position as the most central person in Alexander II's reign as the head of an incredibly powerful aristocratic kin-group which controlled an important network through marriage alliances. This mere fact seems to have given Walter his position. A fourth Walter – [2068] Walter Bisset – had the fifth highest degree and the third highest betweenness, and he was simply a powerful noble knight who was in the king's household. His position is comparable to that of Philip de Mowbray late in the reign of King William. Further, new household offices came to the fore in Alexander's reign, especially those of the king's marischal and the king's doorward or usher, especially as the constableship and perhaps office of butler were honorifics bestowed on men who were rarely at court.

Among the other most central people, chancellors and chamberlains fill many of the top slots, although these positions were held for shorter stretches of time than they had been in the twelfth century. Moreover, there were now bureaucratic structures to maintain the functioning of these offices, so most of the actual work would have been done by lower-downs. [1281] John Maxwell's rank in the number four slot is as much due to his position as sheriff of Roxburgh as his short tenure as chamberlain. Similarly, Thomas of Stirling's job as the clerk of [42] William del Bois (d.1232) was as important as his short time as chancellor. As with King William, churchmen are generally less important in the king's court than they were in the twelfth century, with no obvious spiritual advisor, unless that duty was taken on by [3998] Robert the king's chaplain. Only a third of the top fifteen by degree were clerics, and most of these were bureaucrats. Alexander followed in his father's mould in raising a clerk of the livery to the bishopric of Dunkeld.

The following series of sociograms reveals the key relationships between top players in Alexander's reign. The dataset for Alexander's reign, with 277 documents, is smaller than William's but significantly larger than David's or Malcolm's. The graph density of 0.083 is even smaller than William's (0.095), suggesting that despite being a shorter reign, the trend of decreasing tendency for two individuals to co-witness continued.

The timespan and the issue of successive generations is visible in Figure 5.94, where some of the key players have been labelled. Prominent people from the beginning of the reign are on the right, including

William Comyn, earl of Buchan, and William del Bois, the chancellor. Those who died in the 1240s and 1250s appear farther to the left in the sociogram.

Netdraw sociograms showing co-witnessing thresholds of more than 20 instances have had their edges labelled. These numbers represent the number of times those two people have co-witnessed together. For example, in the sociogram of more than 25 co-witnessing acts, while all the nodes displayed fit those criteria, Walter Stewart and Walter Oliphant have co-witnessed together 41 times, and the others only 27 times.

Figure 5.91. Netdraw: Alexander II witnesses, all co-witnessing acts

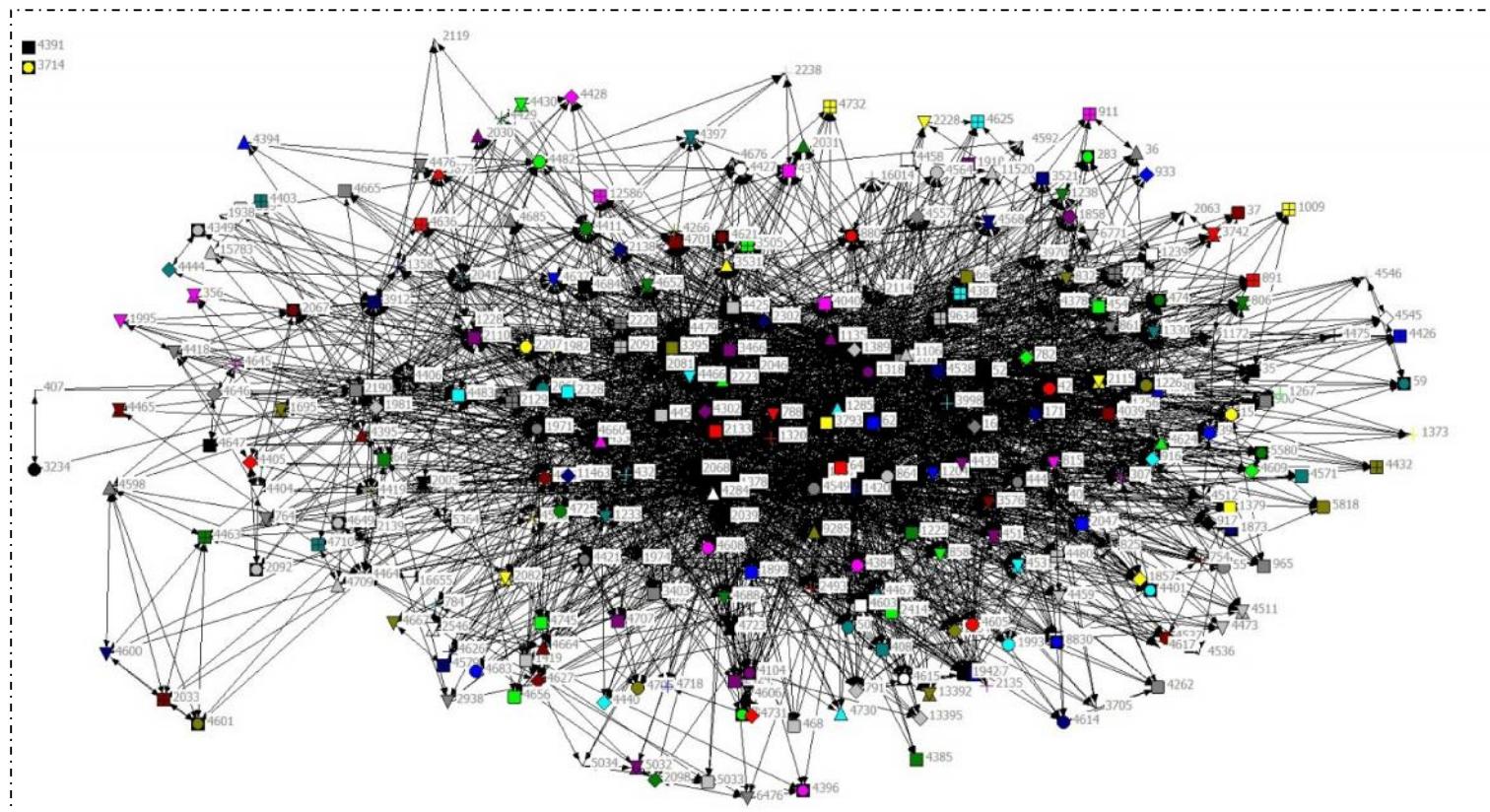


Figure 5.92. Netdraw: Alexander II witnesses, > 2 co-witnessing acts

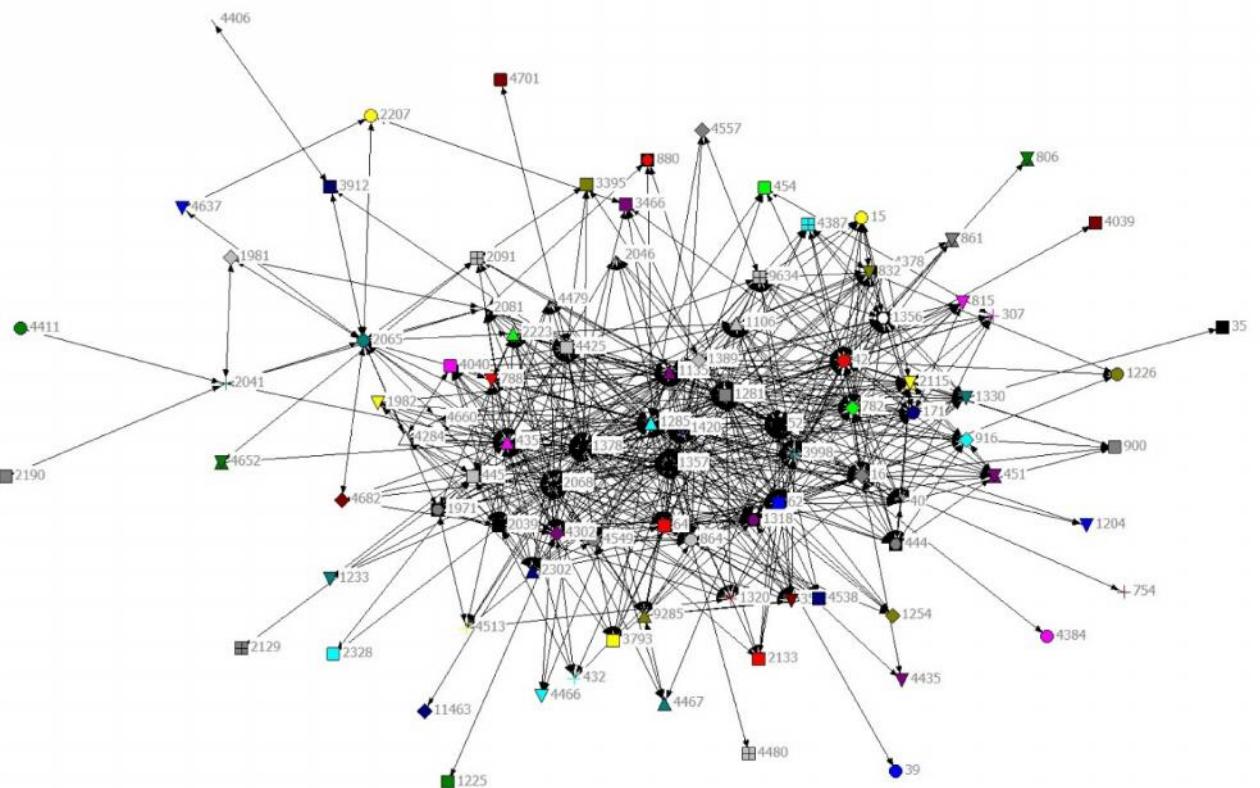


Figure 5.93. Netdraw: Alexander II witnesses, > 5 co-witnessing acts

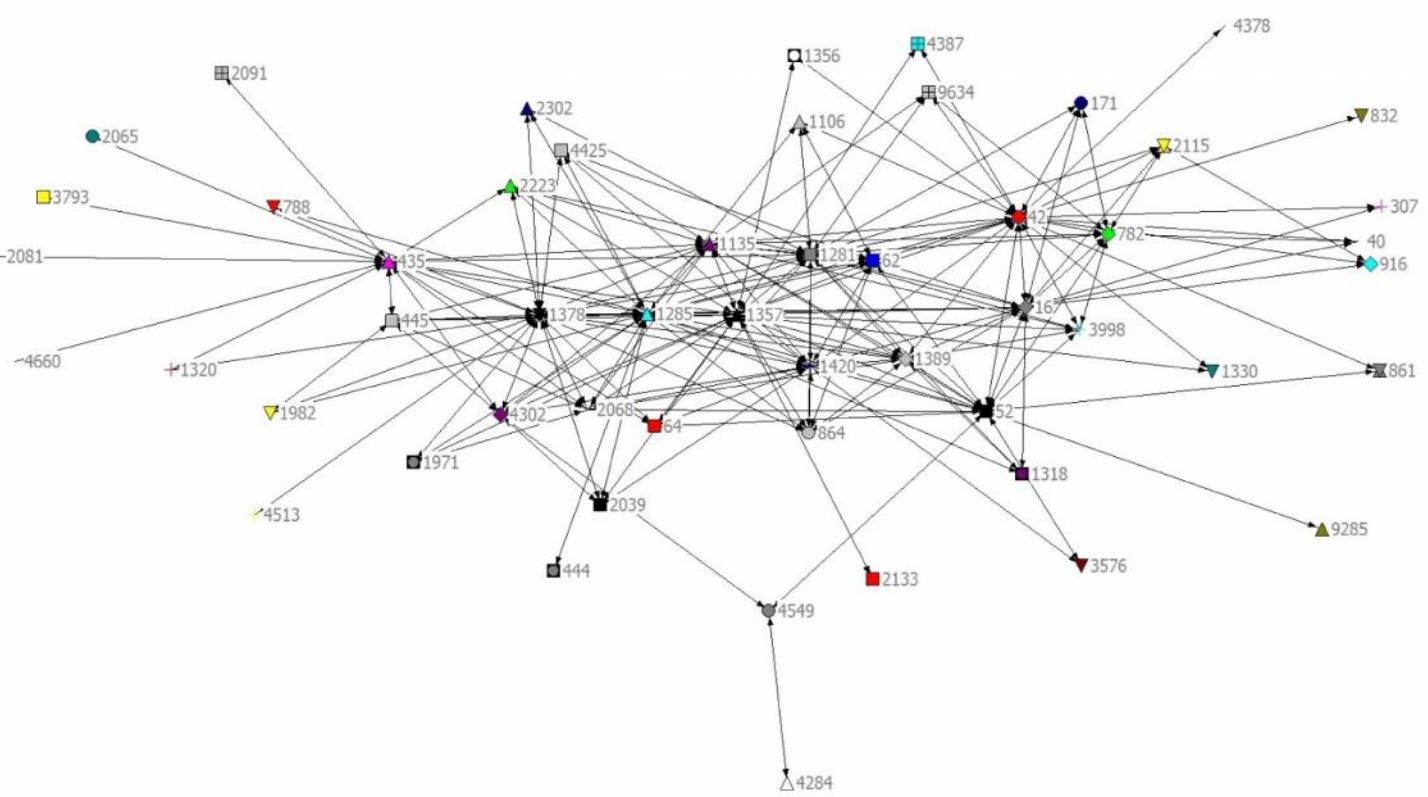


Figure 5.94. Netdraw: Alexander II witnesses, > 7 co-witnessing acts

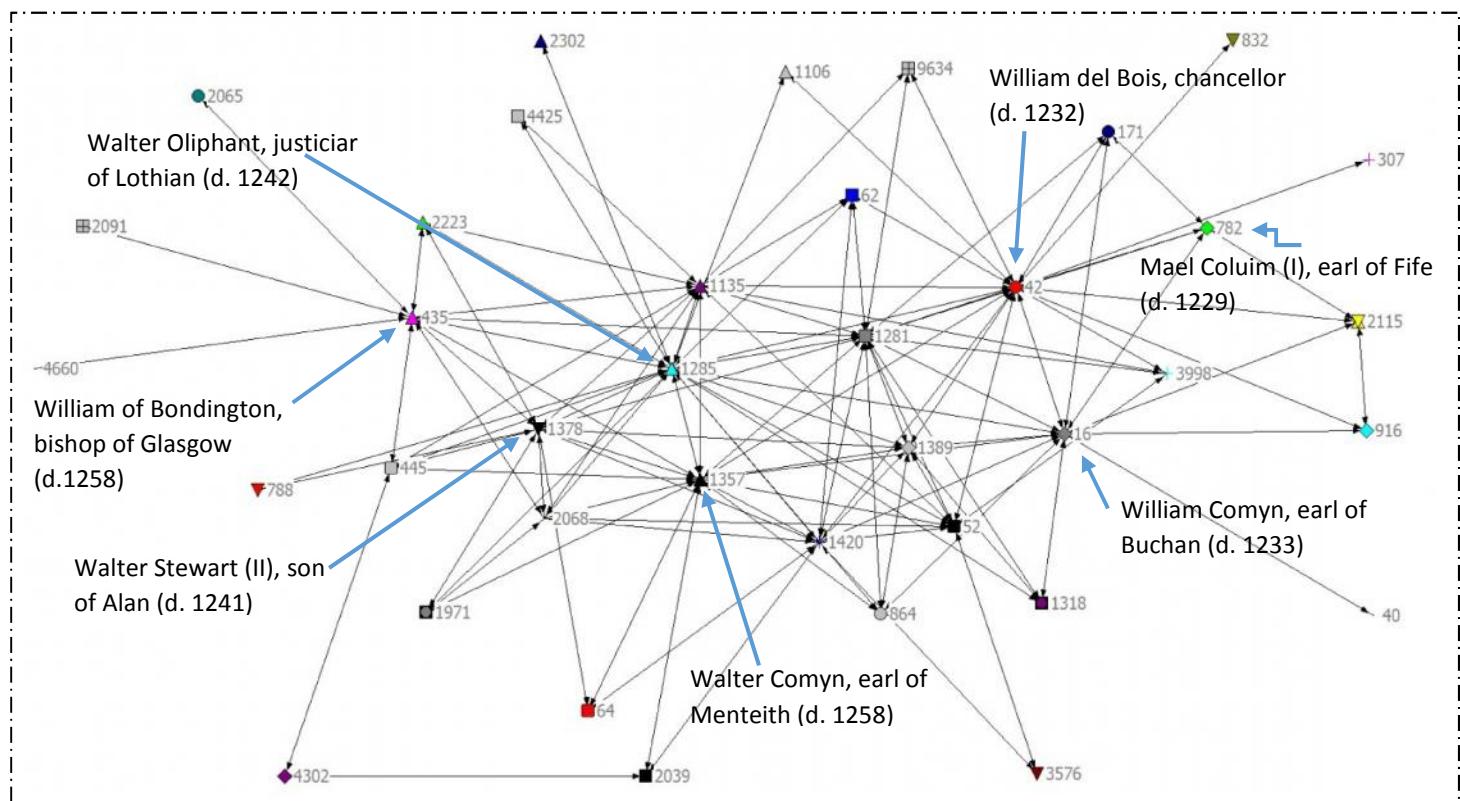


Figure 5.95. Netdraw: Alexander II witnesses, > 10 co-witnessing acts

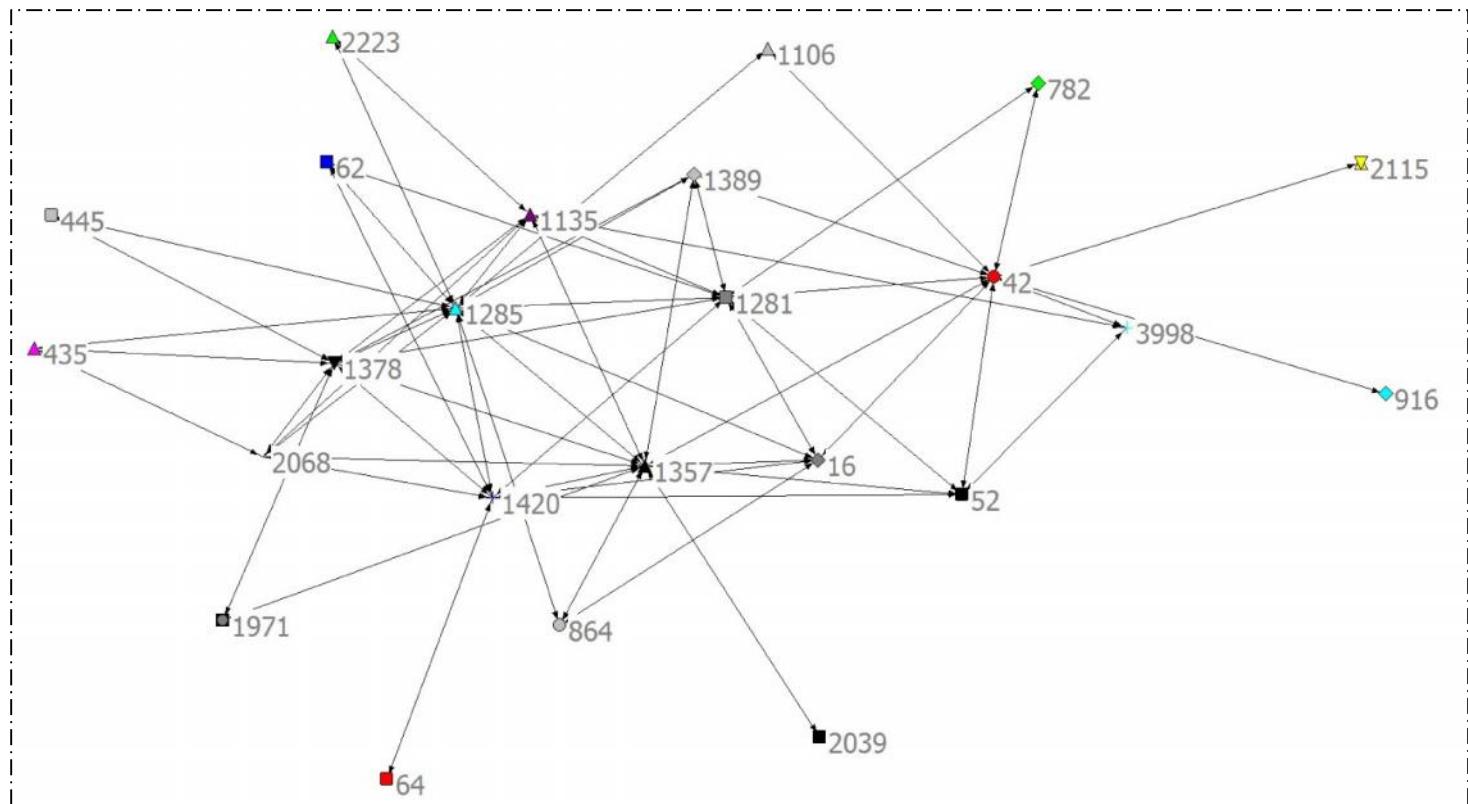


Figure 5.96. Netdraw: Alexander II witnesses, > 15 co-witnessing acts

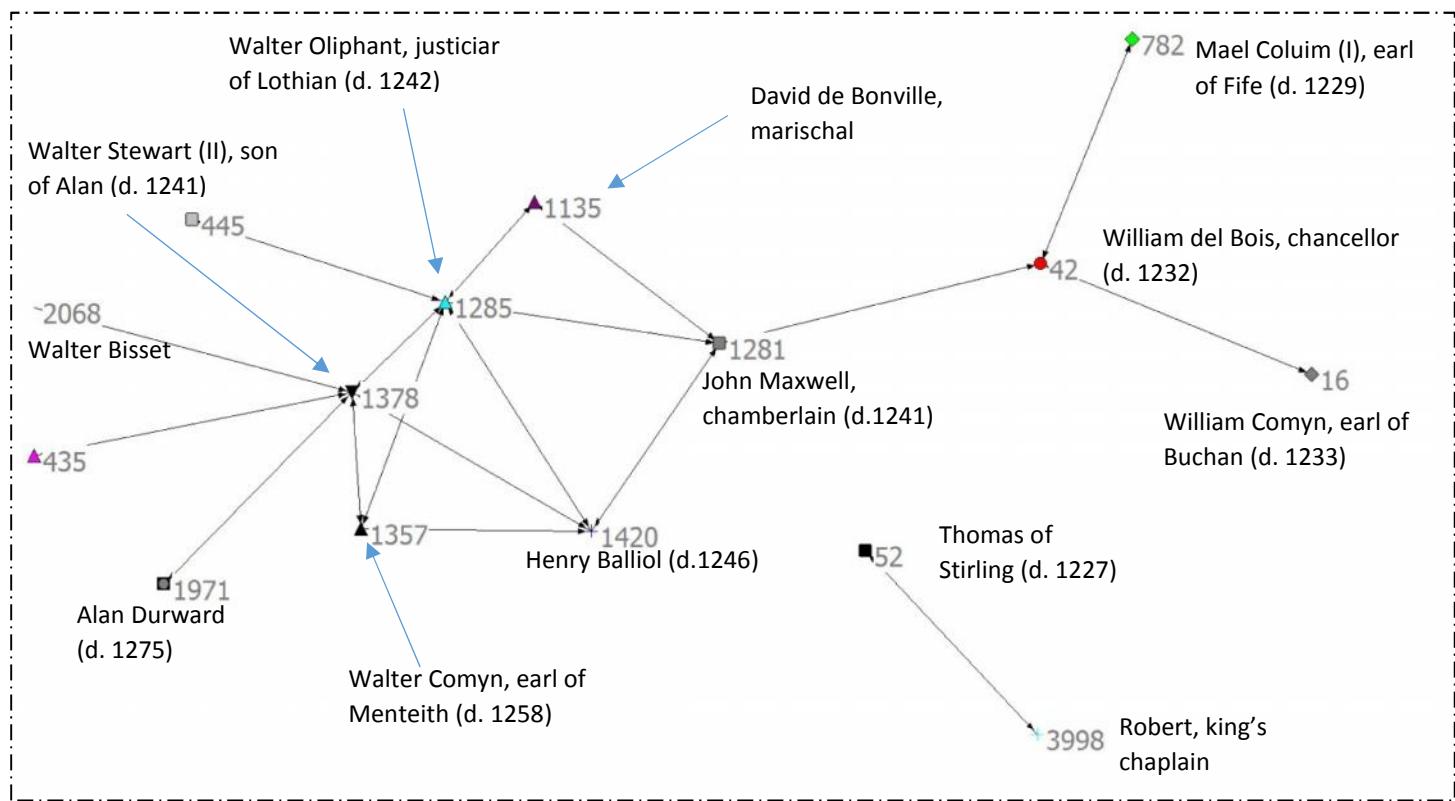


Figure 5.97. Netdraw: Alexander II witnesses, > 17 co-witnessing acts

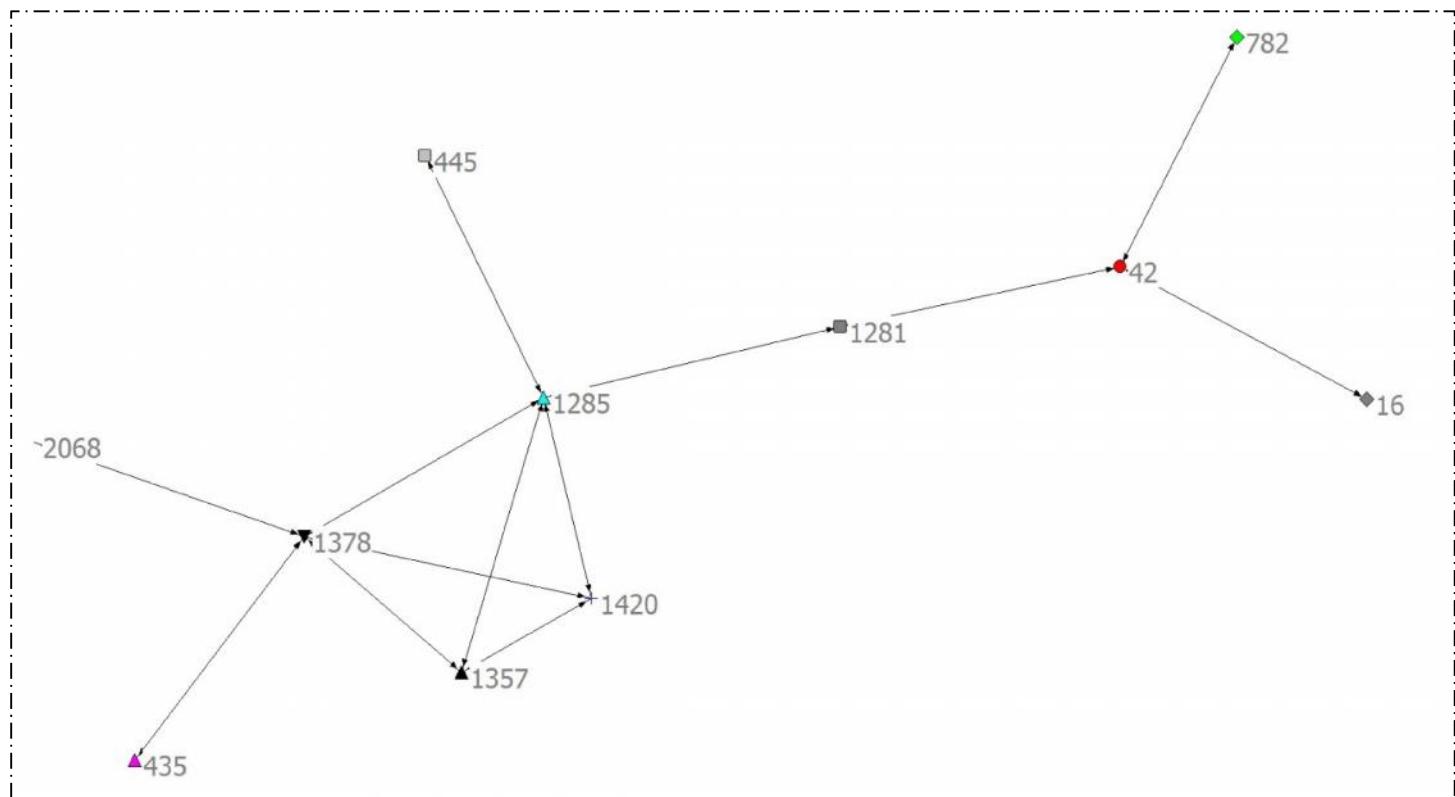


Figure 5.98. Netdraw: Alexander II witnesses, >20 co-witnessing acts

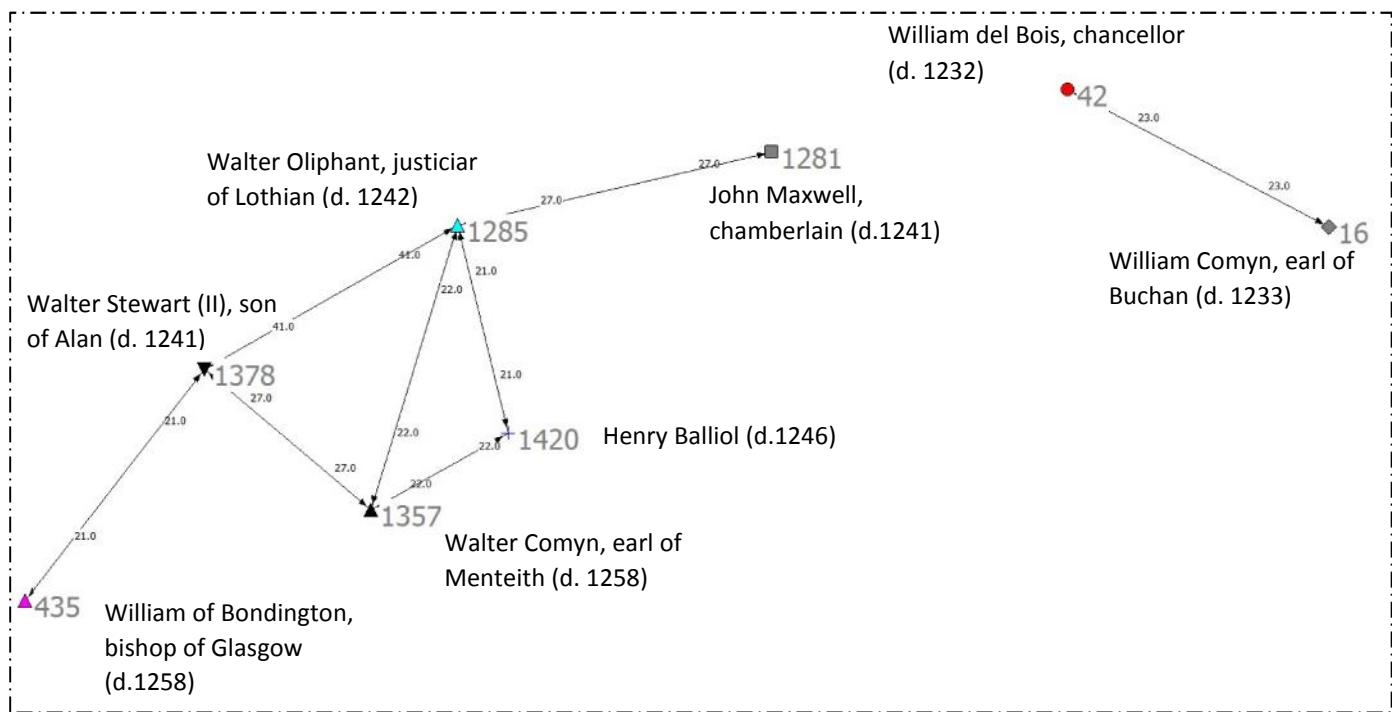


Figure 5.99. Netdraw: Alexander II witnesses, >22 co-witnessing acts

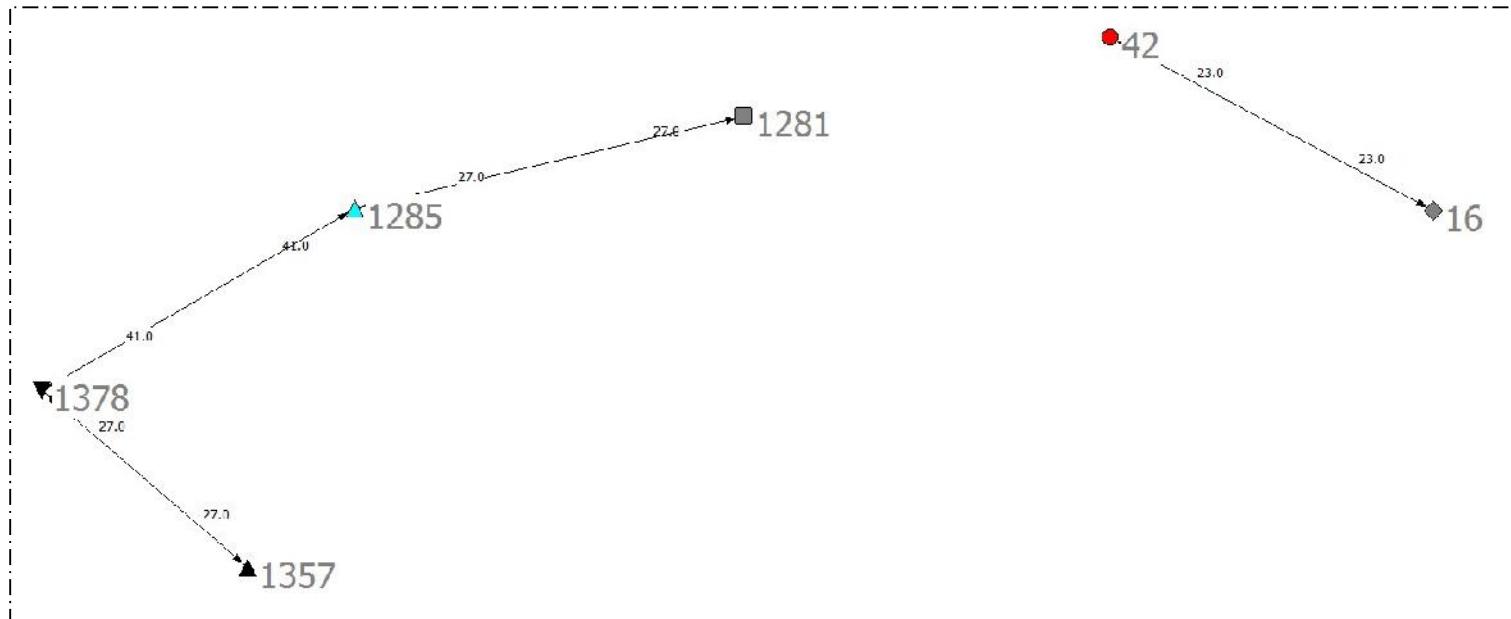


Figure 5.100. Netdraw: Alexander II witnesses, >25 co-witnessing acts

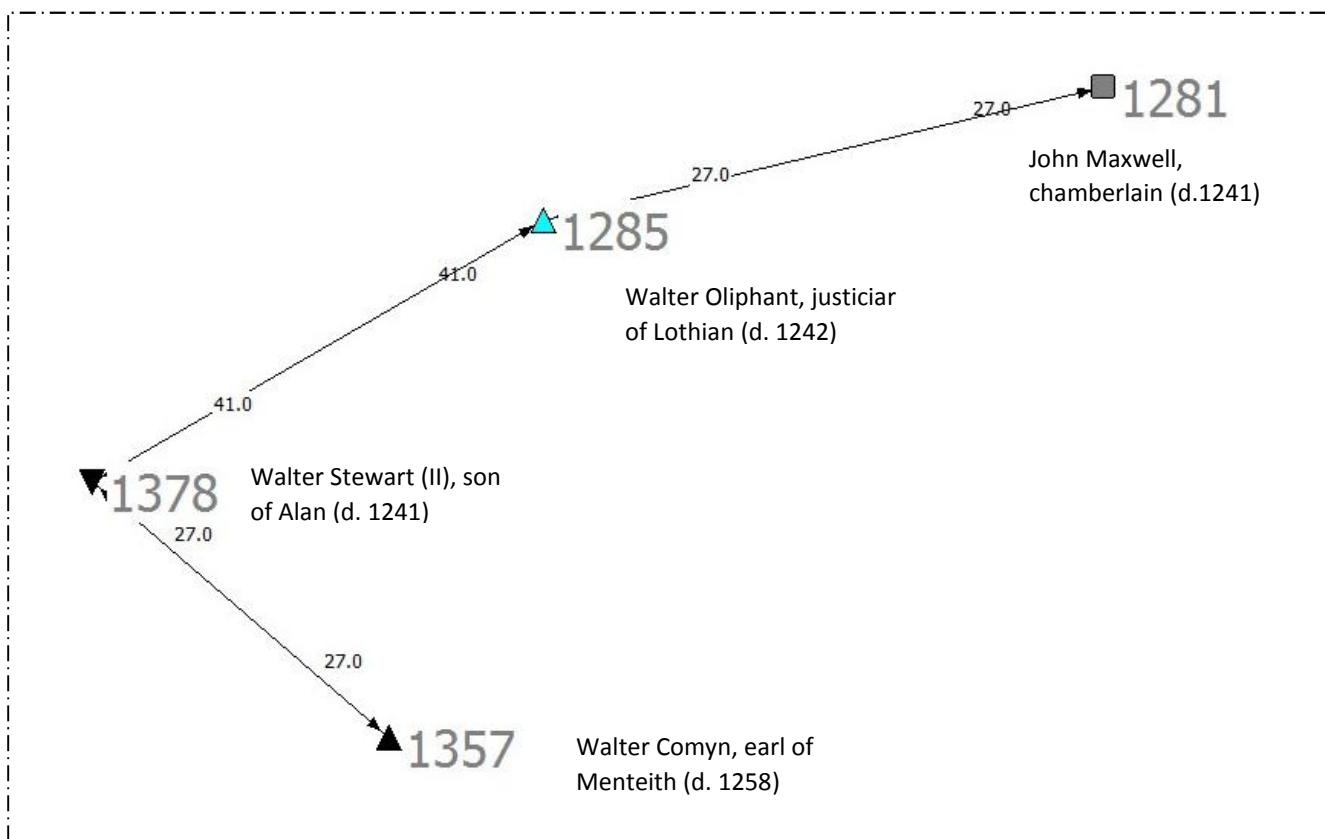


Figure 5.101. Gephi: connections of Walter Comyn, earl of Menteith

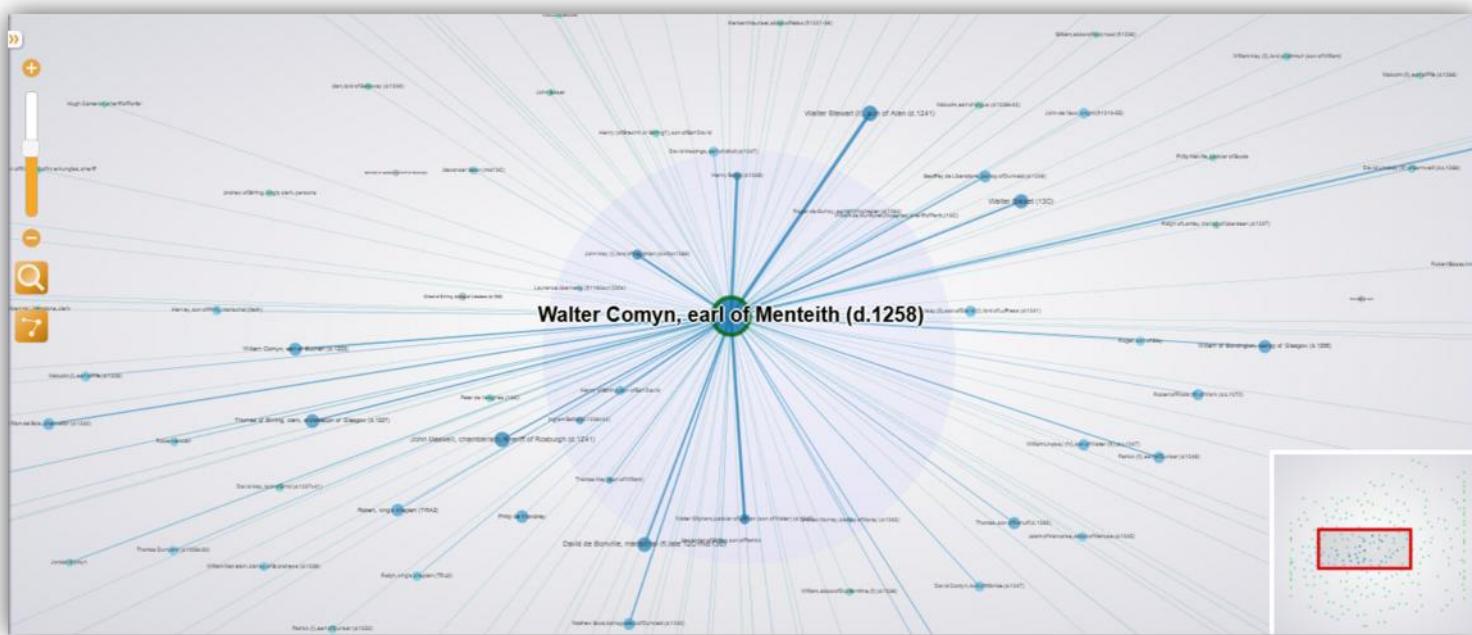


Figure 5.102. Gephi: connections of Walter Oliphant, justiciar of Lothian

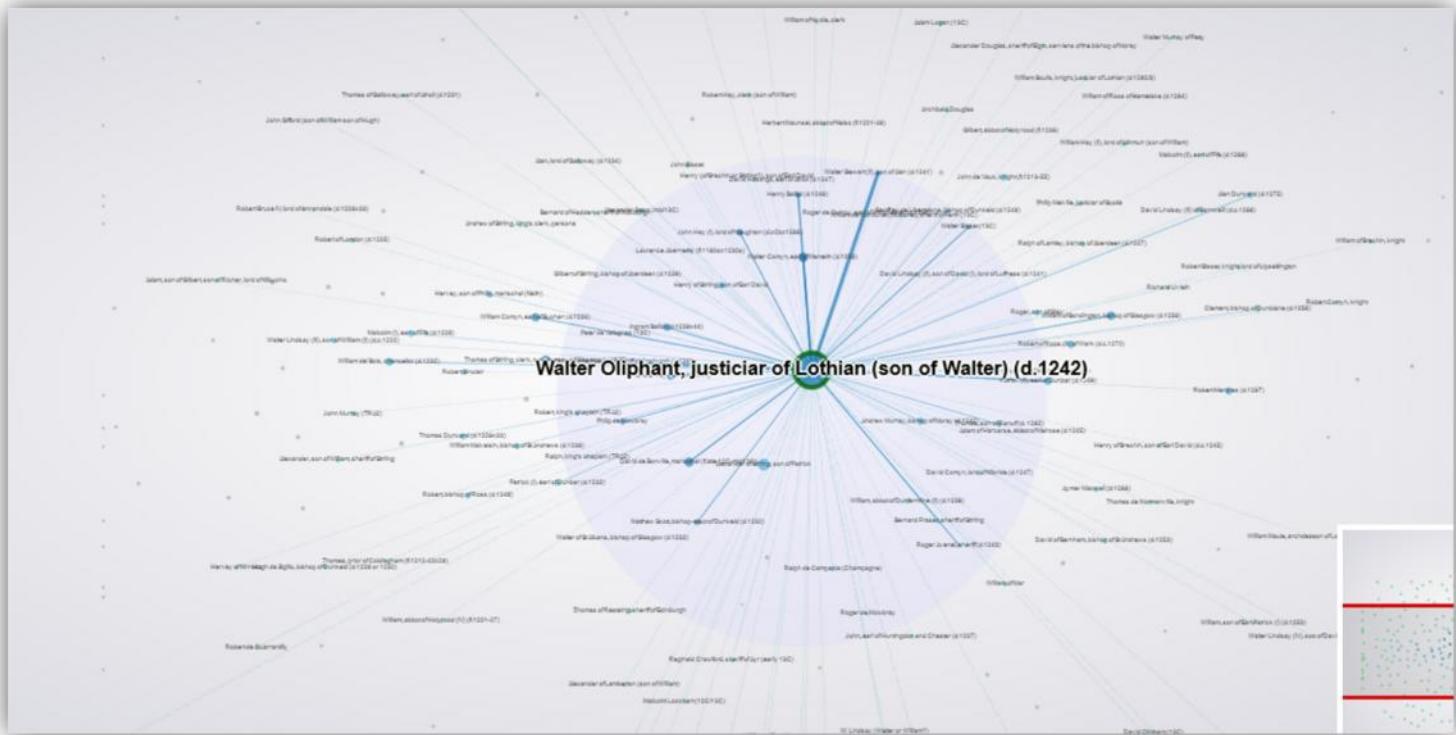


Figure 5.103. Gephi: connections of Walter Stewart (II)

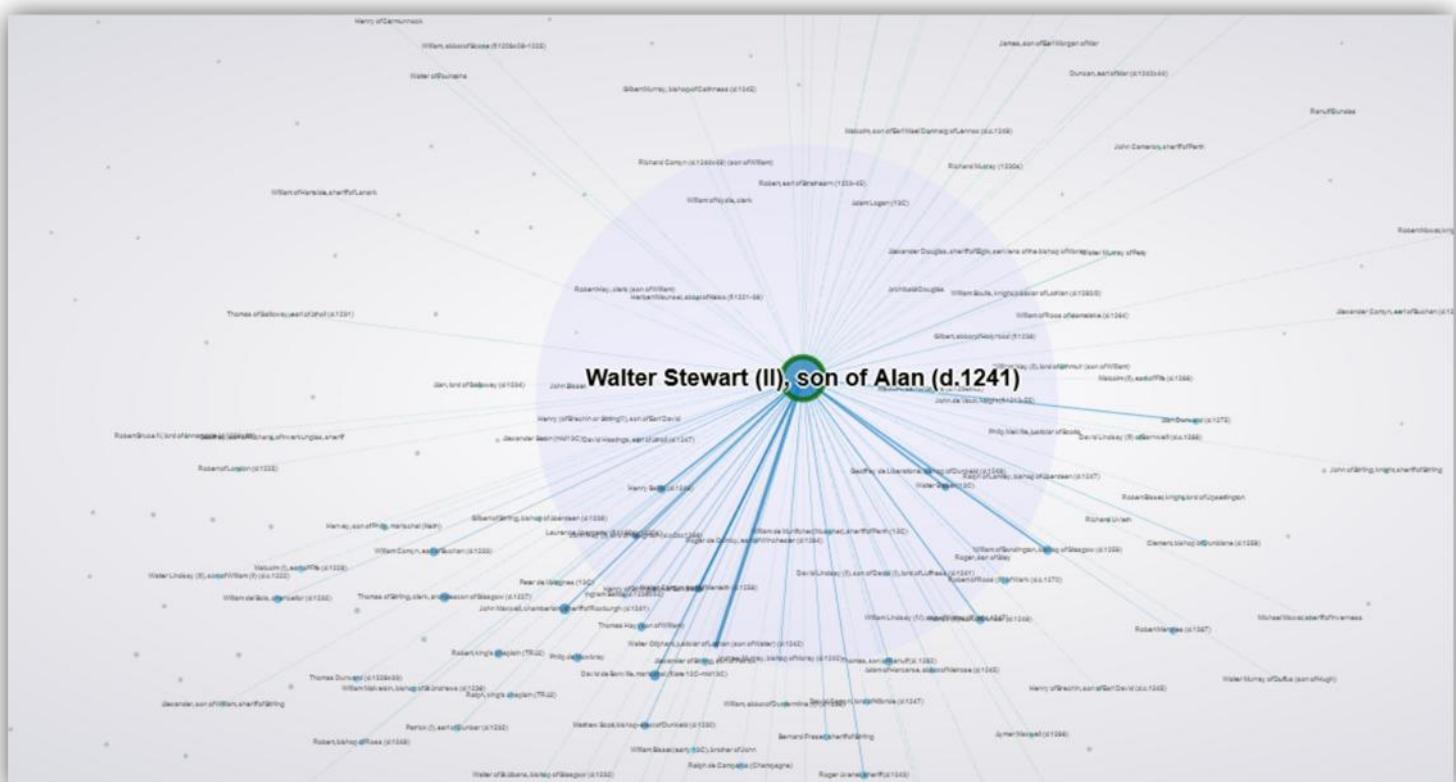


Table 5.30 shows the pair of witnesses who appeared together fifteen or more times in William's documents. Unlike in the previous reigns, the dominant individual in terms of centrality does not predominate in terms of the most active co-witnessing relationships. Walter Comyn, earl of Menteith, is only involved in three of the top ten most productive relationships. By far, the two who witnessed together most often were Walter Stewart and Walter Oliphant, the two justiciars (41 times). Indeed, Walter Oliphant was part of four of the top ten, as was Walter Stewart.

Table 5.30. Pairs who witnessed together 15 or more times

Person 1	Person 2	# docs
Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	Walter Stewart (II), son of Alan (d.1241)	41
Walter Comyn, earl of Menteith (d.1258)	Walter Stewart (II), son of Alan (d.1241)	27
John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	27
William del Bois, chancellor (d.1232)	William Comyn, earl of Buchan (d.1233)	23
Walter Comyn, earl of Menteith (d.1258)	Henry Balliol (d.1246)	22
Walter Comyn, earl of Menteith (d.1258)	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	22
Henry Balliol (d.1246)	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	21
Walter Stewart (II), son of Alan (d.1241)	William of Bondington, bishop of Glasgow (d.1258)	21
William del Bois, chancellor (d.1232)	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	20
Walter Bisset (13C)	Walter Stewart (II), son of Alan (d.1241)	20
William del Bois, chancellor (d.1232)	Malcolm (I), earl of Fife (d.1229)	18
Henry Balliol (d.1246)	Walter Stewart (II), son of Alan (d.1241)	18
Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	Patrick (II), earl of Dunbar (d.1248)	18
John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	David de Bonville, marischal (fl.late 12C-mid13C)	17
John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	Henry Balliol (d.1246)	17
David de Bonville, marischal (fl.late 12C-mid13C)	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	17
Robert, king's chaplain (TRA2)	Thomas of Stirling, clerk, archdeacon of Glasgow (d.1227)	16
David de Bonville, marischal (fl.late 12C-mid13C)	Walter Stewart (II), son of Alan (d.1241)	16
Alan Durward (d.1275)	Walter Stewart (II), son of Alan (d.1241)	16
Walter Comyn, earl of Menteith (d.1258)	John Hay (I), lord of Naughton (d.xOct.1266)	15
Walter Comyn, earl of Menteith (d.1258)	Alan Durward (d.1275)	15
John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	Thomas of Stirling, clerk, archdeacon of Glasgow (d.1227)	15
John Hay (I), lord of Naughton (d.xOct.1266)	Walter Stewart (II), son of Alan (d.1241)	15
Patrick (II), earl of Dunbar (d.1248)	Walter Stewart (II), son of Alan (d.1241)	15

## ALEXANDER III (1249-86)

The study of the witnesses to the documents of King Alexander III included 67 documents, 66 of which were charters, and one was a notification. This was out of a potential 78 documents of the five specified document types: 12 did not have witnesses. All of the co-witnessing studies use the dataset as of October 2014. There were 130 witnesses, all of whom were men, and 872 edges.

Table 5.31. Top 10 witnesses to Alexander III charters by degree

Rank	PoMS ID	Name	Degree	Eigenvector
1	1981	Alexander Comyn, earl of Buchan (d.1289)	71	1
(2)	1810	Simon Fraser (d.1291x92)	42	0.654329
(2)	2041	William, earl of Mar (d.a.1281)	42	0.633257
(4)	446	Patrick (III), earl of Dunbar (d.1289)	41	0.672756
(4)	16347	William Bisset, knight (late 13C)	41	0.530668
(6)	2063	Hugh Abernethy, knight (d. 1291x2)	38	0.606638
(6)	456	Gamelin, bishop of St Andrews (d.1271)	38	0.578304
8	1358	Alexander Stewart of Dundonald (d.1282)	36	0.499602
(9)	2104	Hugh Barclay, justiciar of Lothian	35	0.577079
(9)	2139	Thomas Randolph (d.c.1296)	35	0.518167

Table 5.32. Comparison of centrality by eigenvector versus degree

Rank	PoMS ID	Name	Eigenvector Centrality	%	Degree	Degree rank
1	1981	Alexander Comyn, earl of Buchan (d.1289)	1	100%	71	1
2	446	Patrick (III), earl of Dunbar (d.1289)	0.672756	67%	71	(4)
3	1810	Simon Fraser (d.1291x92)	0.654329	65%	42	(2)
4	2041	William, earl of Mar (d.a.1281)	0.633257	63%	42	(2)
5	2063	Hugh Abernethy, knight (d. 1291x2)	0.606638	61%	38	(6)
6	456	Gamelin, bishop of St Andrews (d.1271)	0.578304	58%	38	(6)
7	2104	Hugh Barclay, justiciar of Lothian	0.577079	58%	35	(9)
8	2099	William Comyn of Kilbride (d.c.1283)	0.535269	54%	30	13
9	16347	William Bisset, knight (late 13C)	0.530668	53%	41	(4)
10	2139	Thomas Randolph (d.c.1296)	0.518167	52%	35	(9)

Table 5.33. Top 10 witnesses to Alexander III charters by betweenness

Rank	PoMS ID	Name	Betweenness
1	1981	Alexander Comyn, earl of Buchan (d.1289)	1676.902
2	16347	William Bisset, knight (late 13C)	920.7781
3	1358	Alexander Stewart of Dundonald (d.1282)	558.4574
4	2139	Thomas Randolph (d.c.1296)	522.9377
5	2166	Patrick Barclay, knight	500.3767
6	1810	Simon Fraser (d.1291x92)	452.6331
7	2041	William, earl of Mar (d.a.1281)	428.4344
8	446	Patrick (III), earl of Dunbar (d.1289)	415.3268
9	2098	John of Lamberton, knight (mid13C)	405.2821
10	2001	Patrick Graham, knight (d.1296)	389.2029

Table 5.34. Top players and their positions (churchman in italics)

Name	Poms Id	Position
Alexander Comyn, earl of Buchan (d.1289)	1981	Justiciar of Scotia, 1253-55; 1258-89
Simon Fraser (d.1291x92)	1810	Sheriff of Traquair, Peebles
William, earl of Mar (d.a.1281)	2041	Chamberlain, 1252-55, ca 1262-ca 1266
Patrick (III), earl of Dunbar (d.1289)	446	Earl of Dunbar
William Bisset, knight (late 13C)	16347	
Hugh Abernethy, knight (d. 1291x2)	2063	Sheriff of Roxburgh
<i>Gamelin, bishop of St Andrews (d.1271)</i>	456	Chancellor, 1254-55
Alexander Stewart of Dundonald (d.1282)	1358	Steward
Hugh Barclay, justiciar of Lothian	2104	Justiciar of Lothian, 1258, ca 1262- ca 1279
Thomas Randolph (d.c.1296)	2139	Sheriff of Dumfries, Roxburgh, Berwick

There is one overriding figure towering over the charter witnesses of Alexander III: [1981] Alexander Comyn, earl of Buchan (d. 1289), half-brother of Walter Comyn, earl of Menteith (d. 1258), the most central man in Alexander II's reign. Even at the level of people who co-witness more than one time, his centrality is clear (see Figure 5.00 below). In addition to being politically active through the whole reign of Alexander III, Comyn was both head of the most powerful kin-based network in the kingdom and had the viceregal powers of the justiciar of Scotia for most of the reign. Furthermore, [2041] William, earl of Mar (d. ×1281) who held the chamberlainship at various points in the 1250s and 1260s,

was Alexander Comyn's brother-in-law. [2099] William Comyn of Kilbride (d.c.1283), Alexander Comyn's nephew (Walter Comyn, earl of Menteith's, son), also appears in the league tables.

The steward, [2104] Alexander of Dundonald (d. 1282) and the justiciar of Lothian, [2104] Hugh Barclay, although from well-established families who have held prominent positions in previous reigns, appear somewhat further down the league tables, their rankings perhaps usurped by the upstarts of new families (at this level), like [1810] Simon Fraser (d.1291x92) and [2063] Hugh Abernethy (d. 1291x2), and [2139] Thomas Randolph (d.c.1296). We see the Bissets and the earls of Dunbar holding important positions, as we did in Alexander II's time. The earls of Fife no longer figure as central royal witnesses after the time of Earl Malcolm (I) (d. 1229). It is also clear that the most well-connected in the kingdom were contributing to the administration of the realm through acting as sheriffs, a position which presumably contributed something back to their own coffers. Chamberlains and especially chancellors seem to have been less important than ever among royal witnesses, and churchmen are almost completely absent. [456] Gamelin, bishop of St Andrews, is the only one to appear, and while he was chancellor for a short time, he witnesses mostly as bishop.

Figure 5.104. Netdraw: Alexander III witnesses, > co-witnessing acts

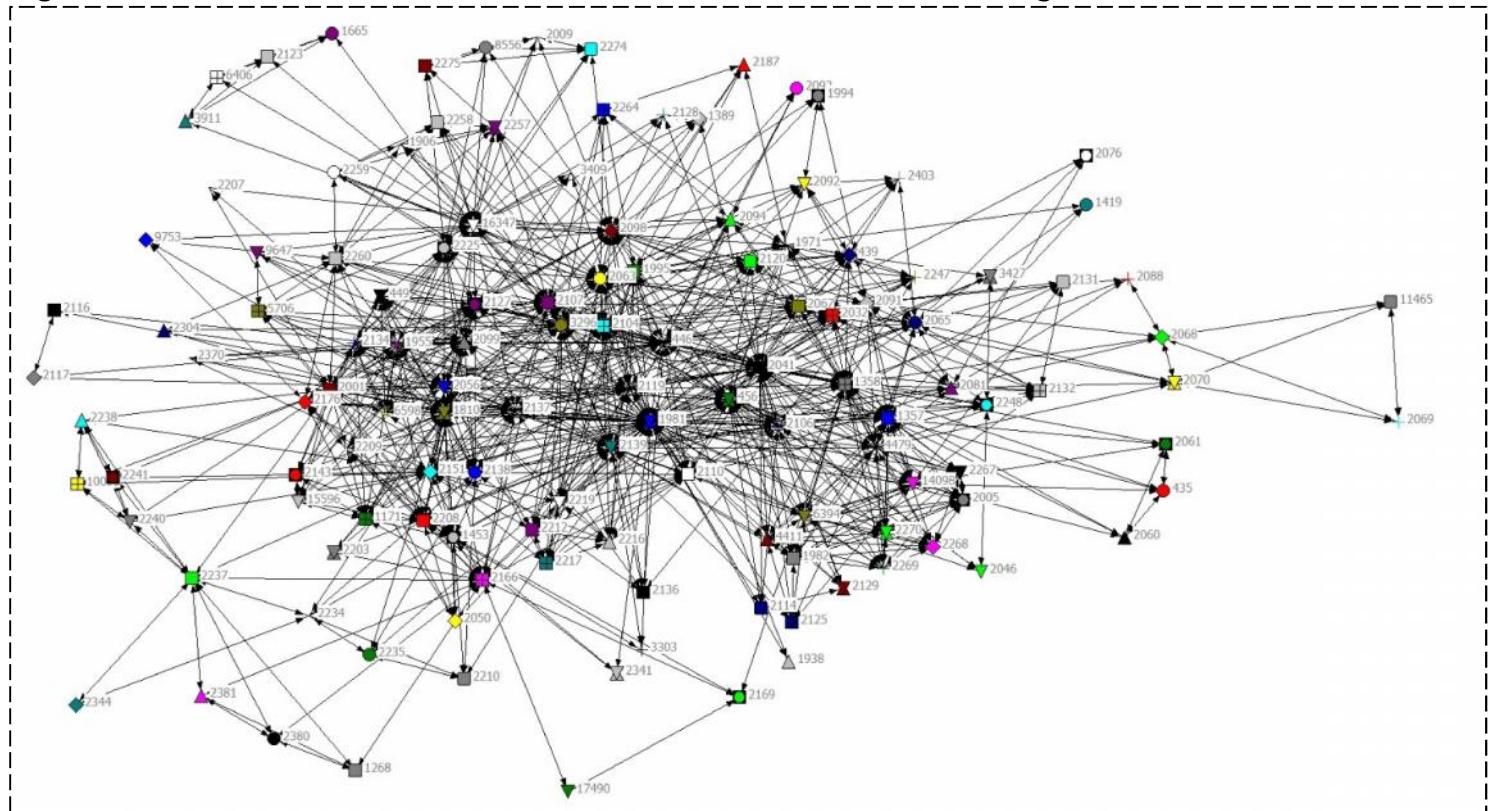


Figure 5.105. Netdraw: Alexander III witnesses, >1 co-witnessing act

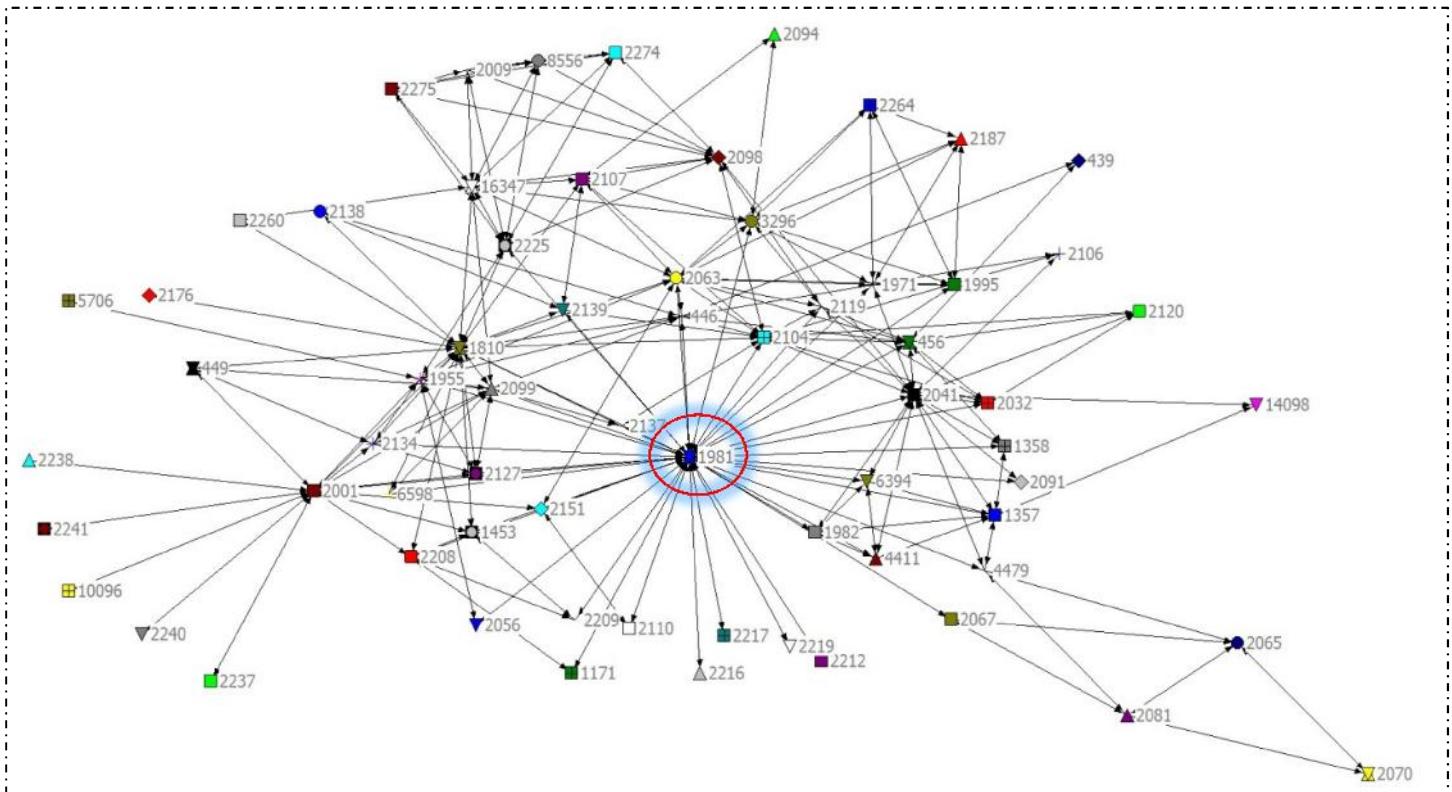


Figure 5.106. Netdraw: Alexander III witnesses, >2 co-witnessing acts

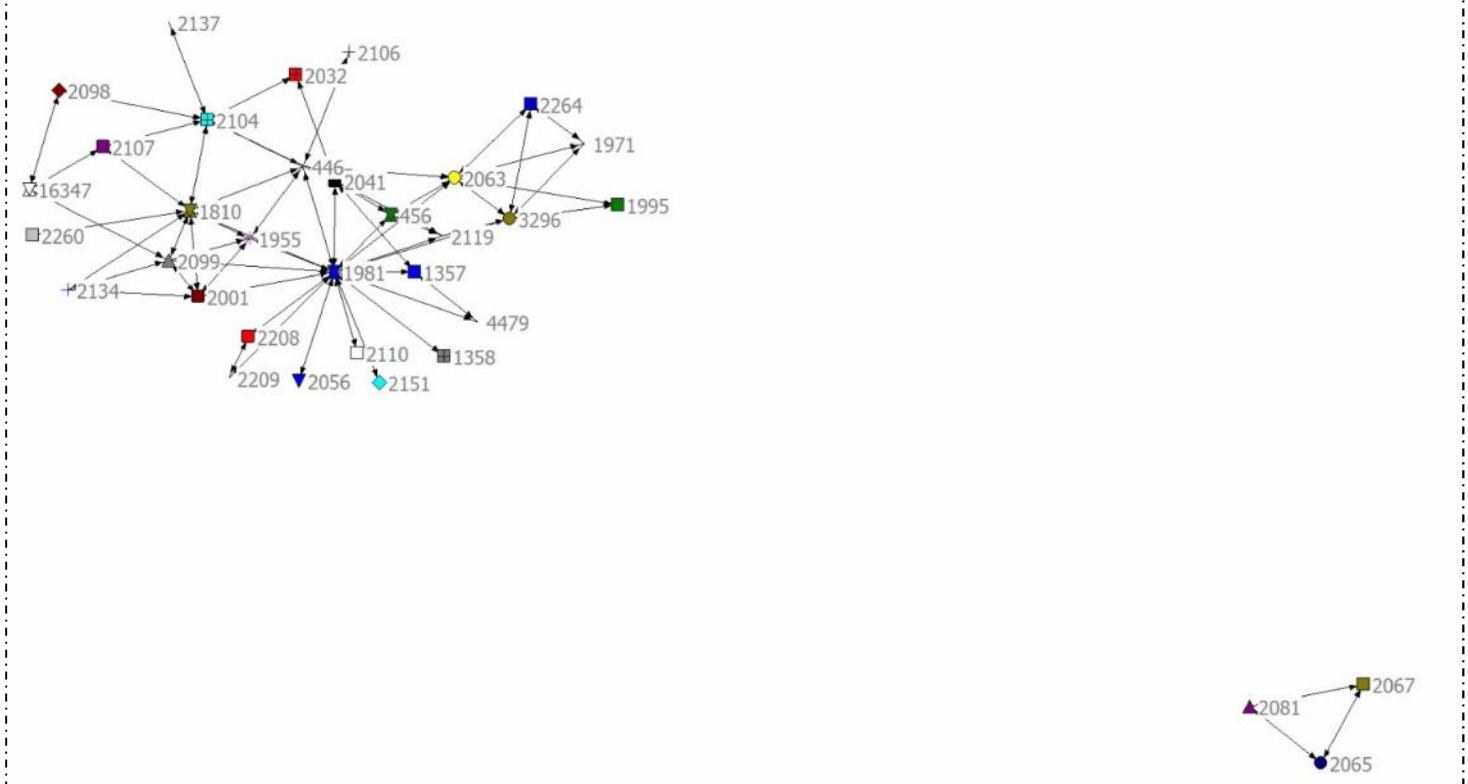


Figure 5.107. Gephi: Alexander III witnesses, >2 co-witnessing acts

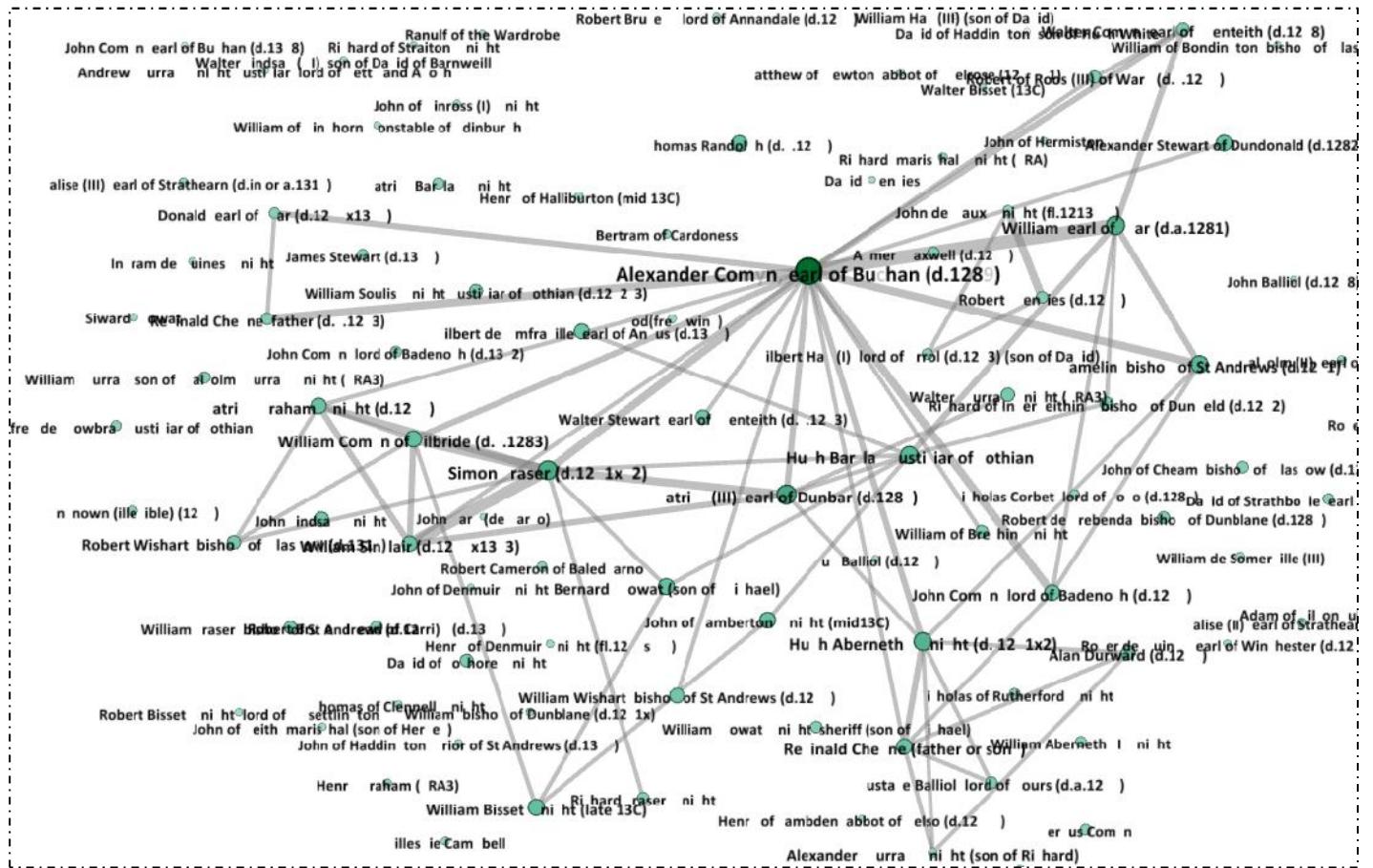


Figure 5.108. Gephi: Alexander Comyn connections, >2 co-witnessing acts

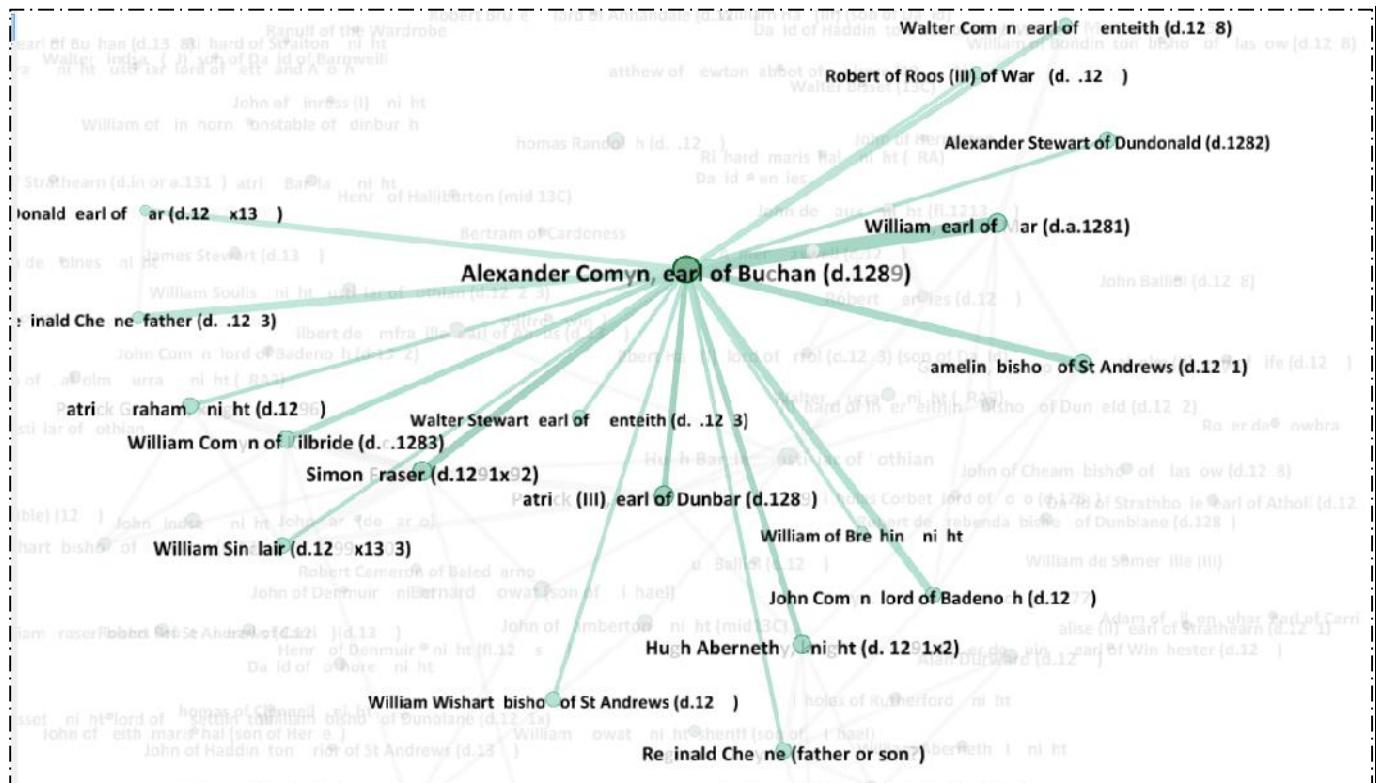


Figure 5.109. Netdraw: Alexander III witnesses, >3 co-witnessing acts

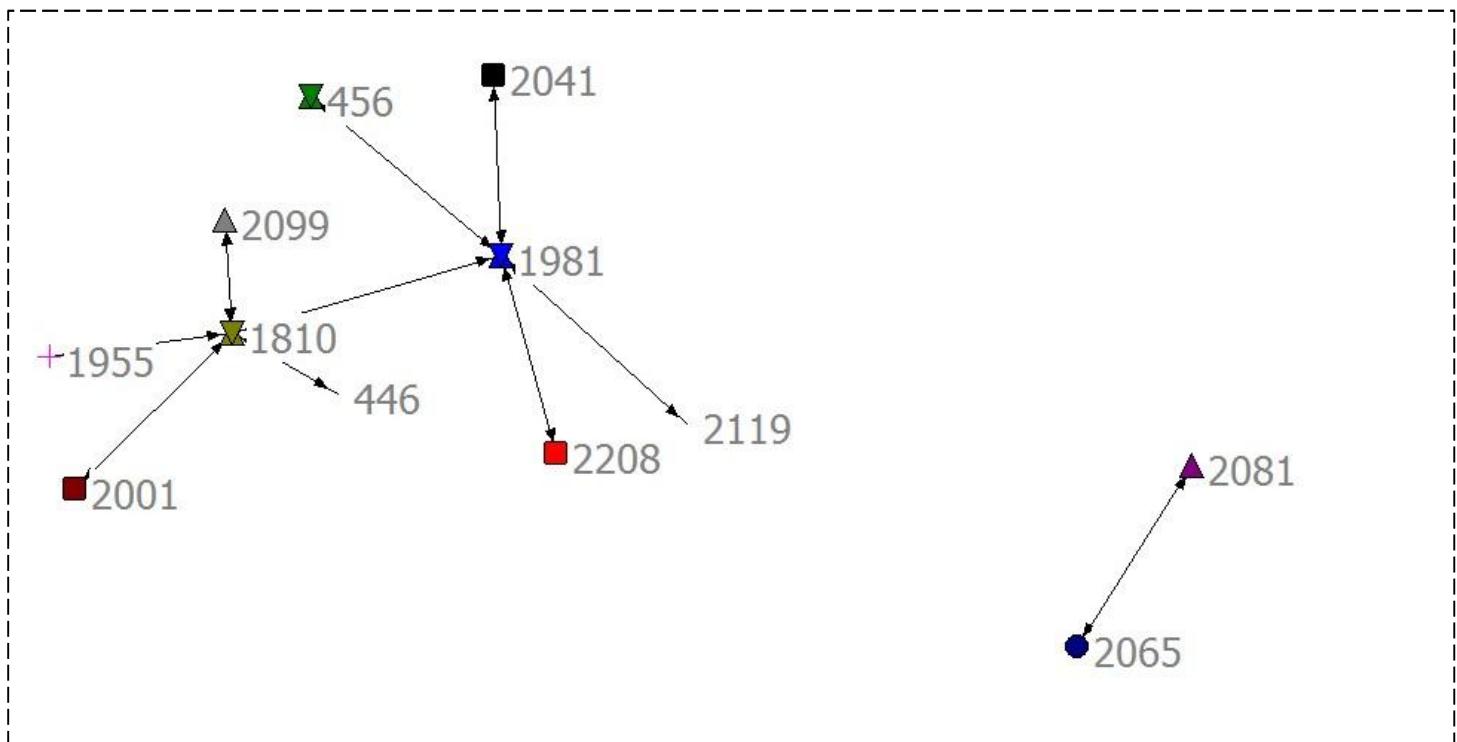


Figure 5.110. Gephi: Simon Fraser connections, >3 co-witnessing acts

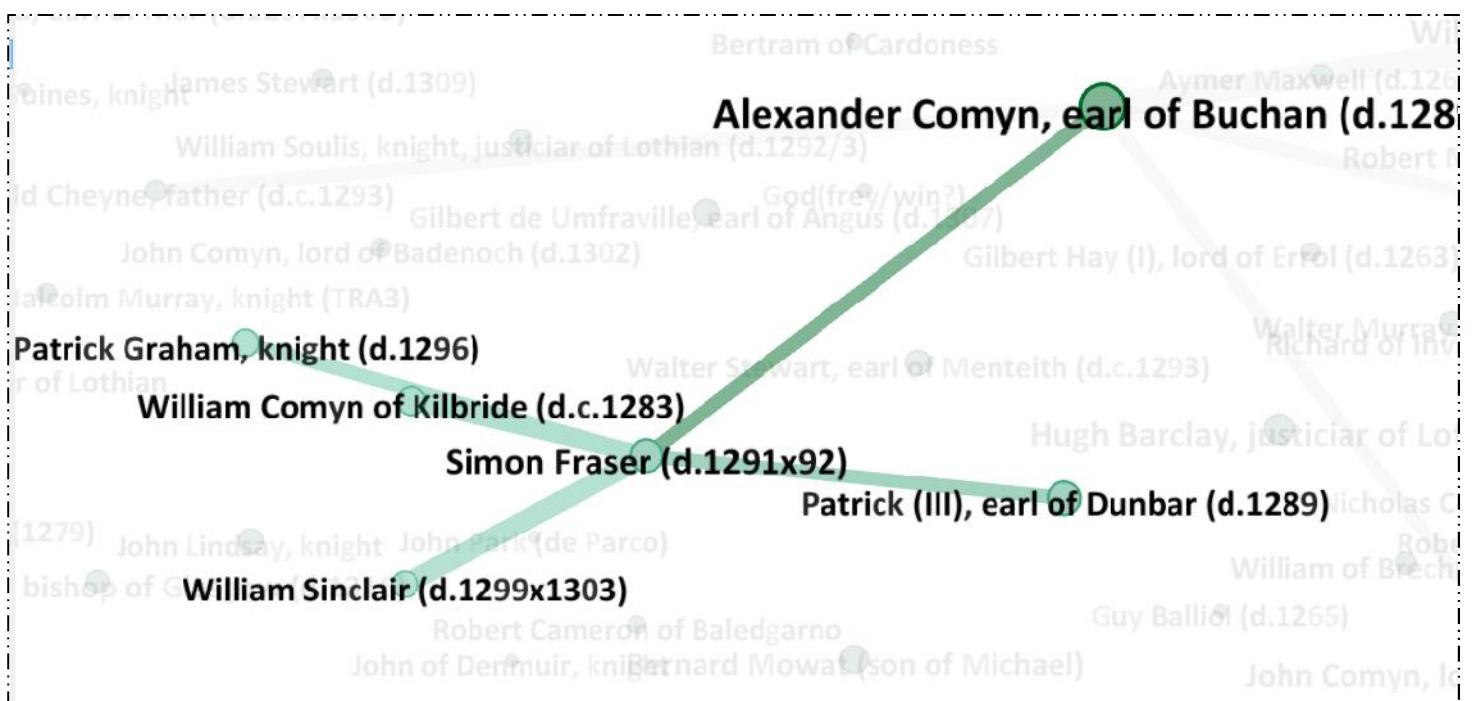


Figure 5.111. Gephi: Alexander Comyn connections, >3 co-witnessing acts

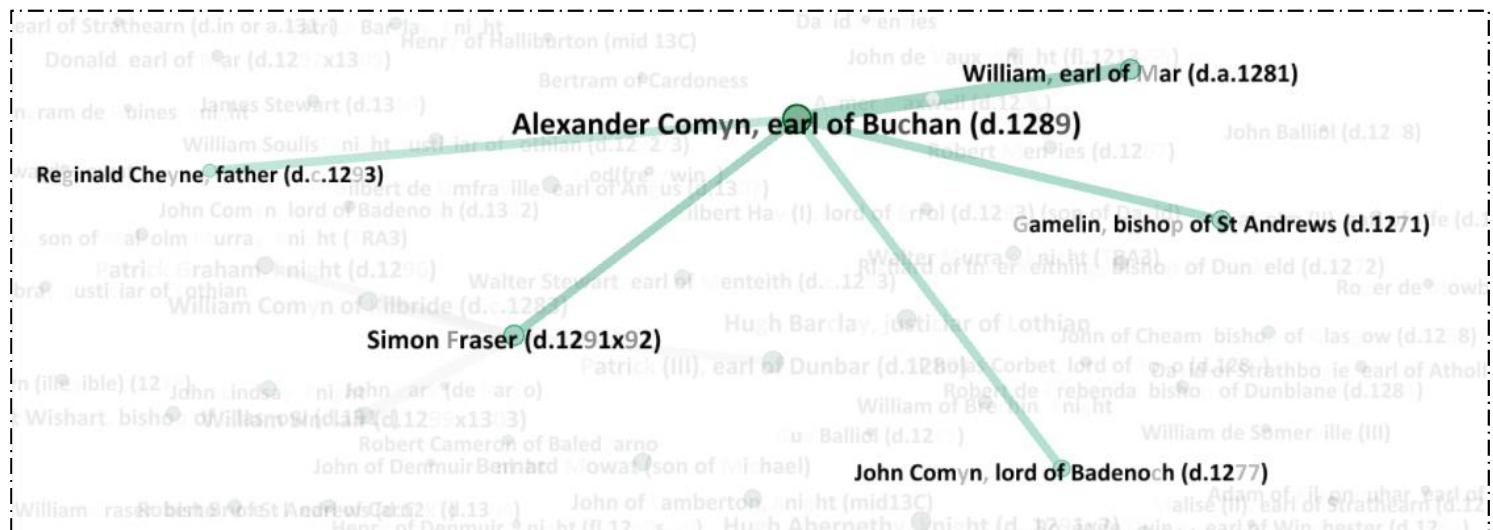


Figure 5.112. Netdraw: Alexander III witnesses, >4 co-witnessing acts

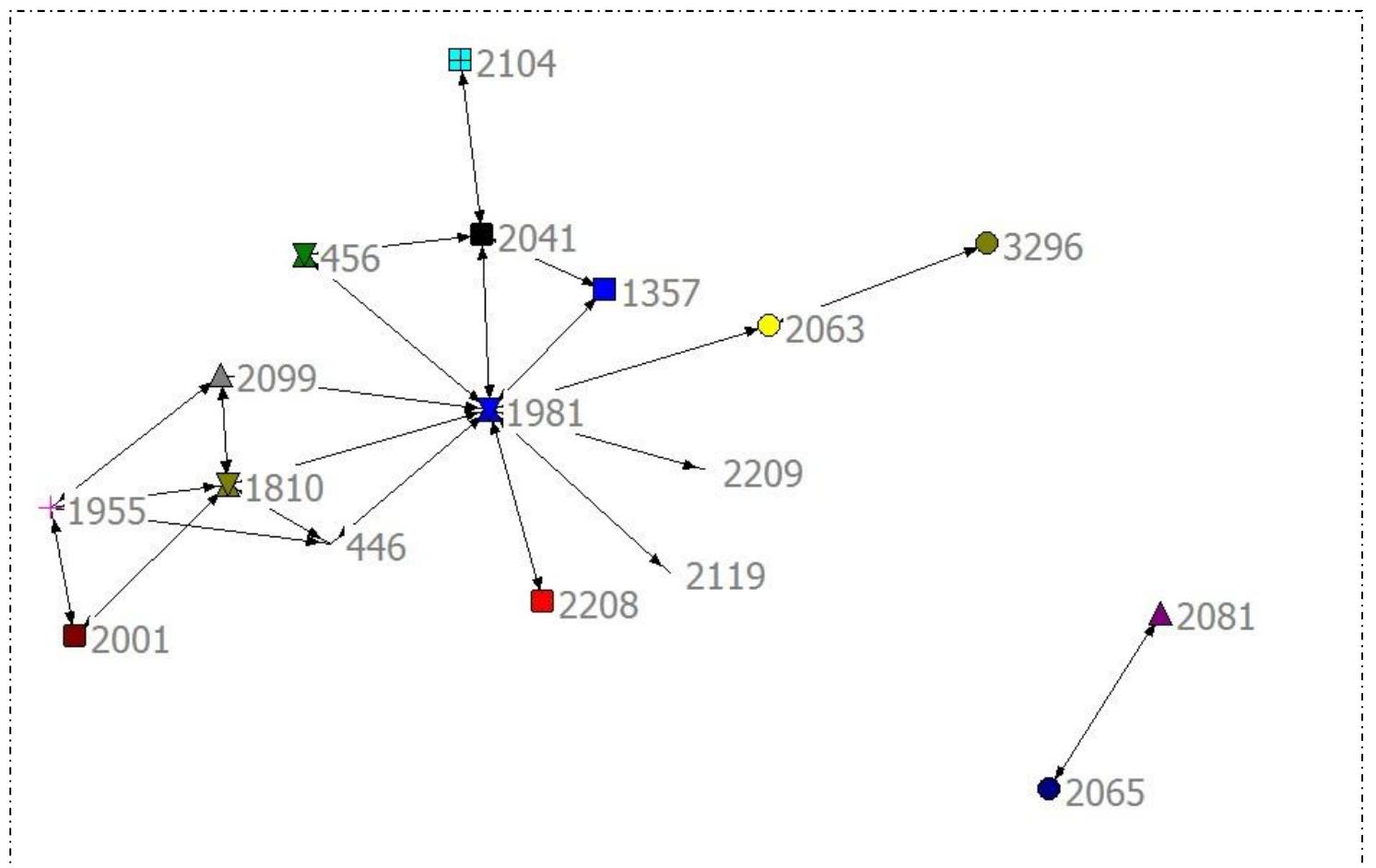


Figure 5.113. Netdraw: Alexander III witnesses, >5 co-witnessing acts

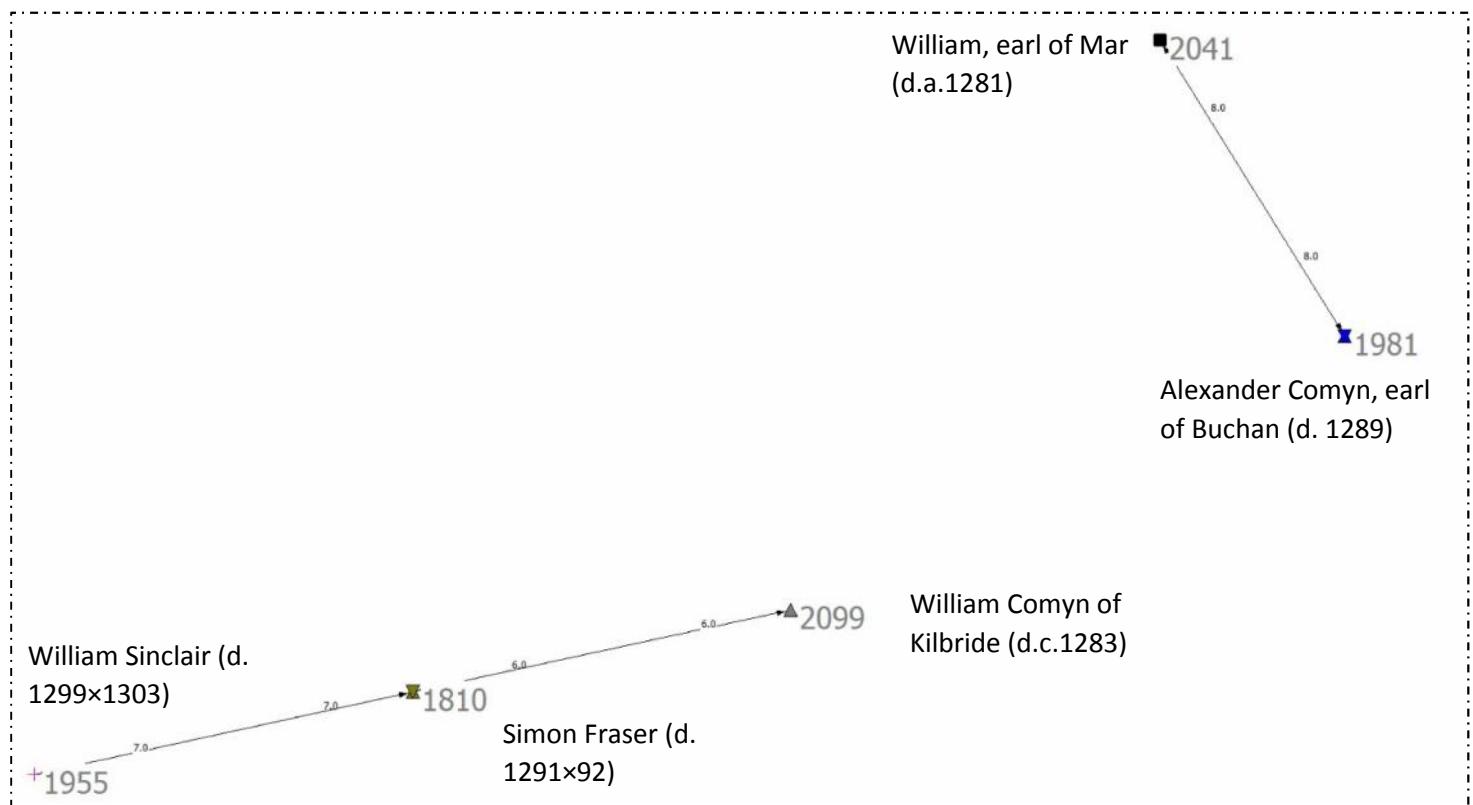
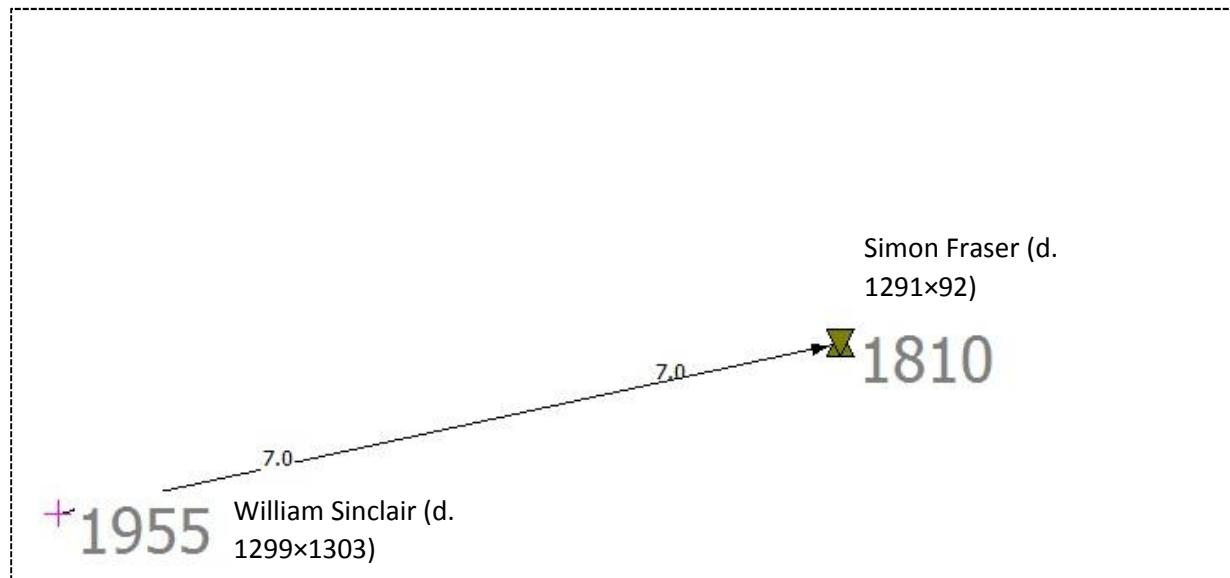


Figure 5.114. Netdraw: Alexander III witnesses, >6 co-witnessing acts



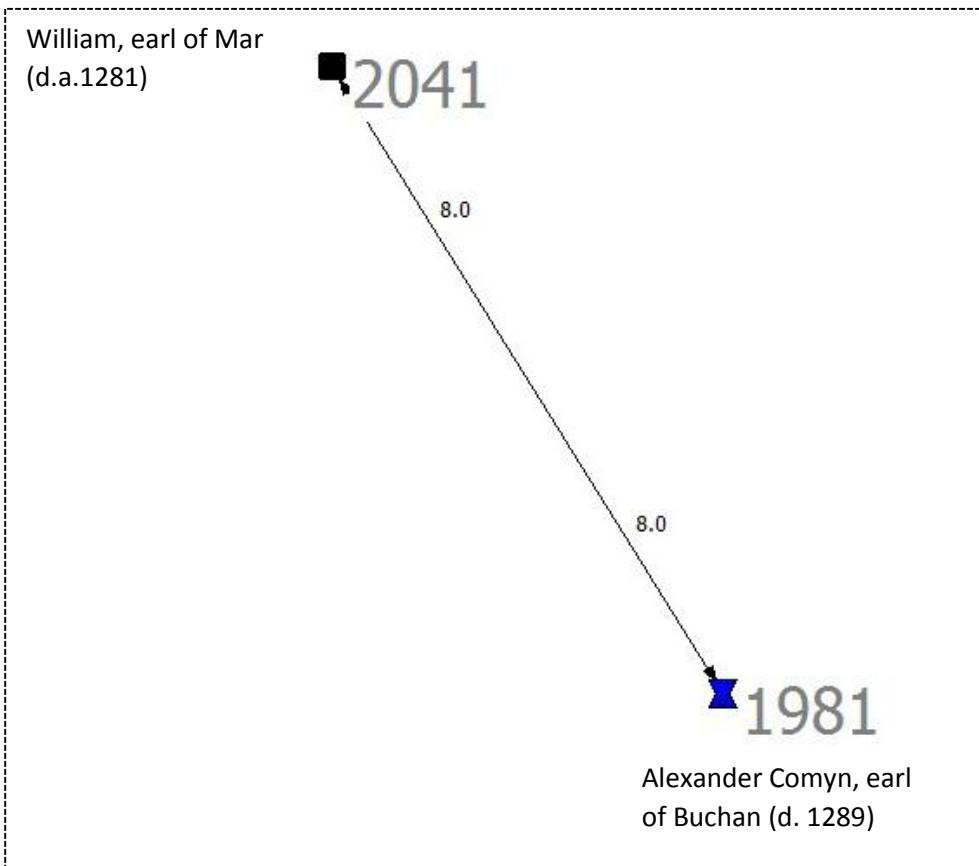


Figure 5.115. Gephi: connections of Alexander Comyn, earl of Buchan

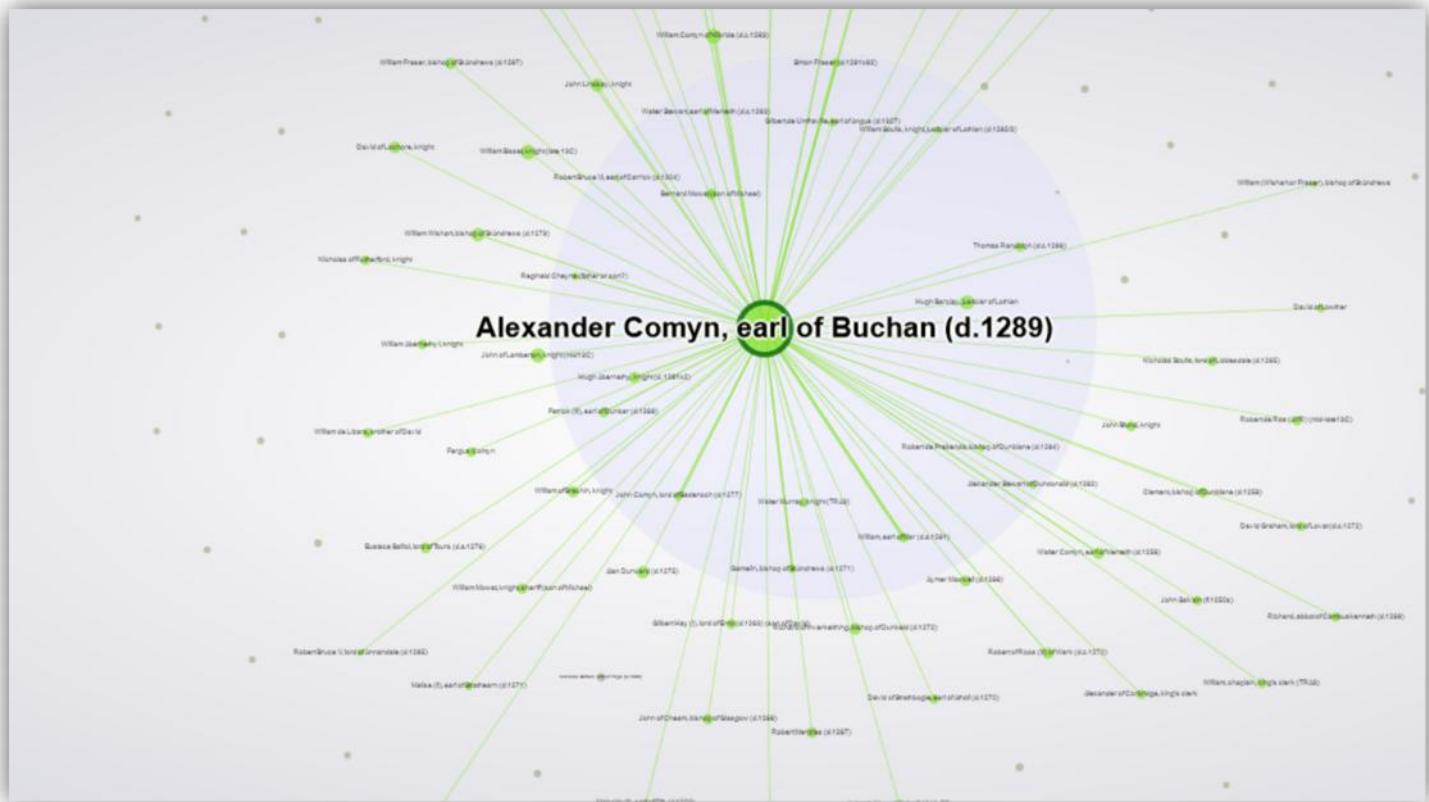


Table 5.35 lists pairs who witnessed together four or more times. Unsurprisingly, Alexander Comyn, earl of Buchan (d. 1289) appears heavily, nine times, and the most active pair were Alexander and his brother-in-law, Earl William. Notably, Simon Fraser (d. 1291x92) appears in five of the top ten.

Table 5.35. Pairs who witnessed together 4 or more times

Person 1	Person 2	# docs
Alexander Comyn, earl of Buchan (d.1289)	William, earl of Mar (d.a.1281)	8
Simon Fraser (d.1291x92)	William Sinclair (d.1299x1303)	7
Simon Fraser (d.1291x92)	William Comyn of Kilbride (d.c.1283)	6
Patrick (III), earl of Dunbar (d.1289)	Simon Fraser (d.1291x92)	5
Alexander Comyn, earl of Buchan (d.1289)	John Comyn, lord of Badenoch (d.1277)	5
Alexander Comyn, earl of Buchan (d.1289)	Simon Fraser (d.1291x92)	5
Alexander Comyn, earl of Buchan (d.1289)	Reginald Cheyne, father (d.c.1293)	5
Robert Menzies (d.1267)	John de Vaux, knight (fl.1213-55)	5
Gamelin, bishop of St Andrews (d.1271)	Alexander Comyn, earl of Buchan (d.1289)	5
Simon Fraser (d.1291x92)	Patrick Graham, knight (d.1296)	5
Hugh Barclay, justiciar of Lothian	William, earl of Mar (d.a.1281)	4
Walter Comyn, earl of Menteith (d.1258)	William, earl of Mar (d.a.1281)	4
Patrick (III), earl of Dunbar (d.1289)	Alexander Comyn, earl of Buchan (d.1289)	4
Patrick (III), earl of Dunbar (d.1289)	William Sinclair (d.1299x1303)	4
Alexander Comyn, earl of Buchan (d.1289)	Walter Comyn, earl of Menteith (d.1258)	4
Alexander Comyn, earl of Buchan (d.1289)	William Comyn of Kilbride (d.c.1283)	4
Alexander Comyn, earl of Buchan (d.1289)	Donald, earl of Mar (d.1297x1305)	4
Hugh Abernethy, knight (d. 1291x2)	Reginald Cheyne (father or son?)	4
Hugh Abernethy, knight (d. 1291x2)	Alexander Comyn, earl of Buchan (d.1289)	4
Gamelin, bishop of St Andrews (d.1271)	William, earl of Mar (d.a.1281)	4
William Sinclair (d.1299x1303)	William Comyn of Kilbride (d.c.1283)	4
William Sinclair (d.1299x1303)	Patrick Graham, knight (d.1296)	4

## PART THREE: TIME SLICES

It is clear that meaningful comparison of the reigns of William and Alexander II with the other reigns is hampered by their greater lengths, and the tendency for multiple generations to be lumped together. Dividing these reigns up into shorter periods, with more comparable numbers of documents and witnesses to the reigns of David and Malcolm allows for a more effective analysis of the shifts taking place in the network of those closest to the king. Before 1222, however, nearly all royal documents had no year included in the date of time, and accurate dating is generally only achieved by examining the witnesses. The deaths of chancellors, in particular, often mark the terminus ante quem of our date ranges. I have divided the reigns of William and Alexander II into three 'time slices' each. The length of each and the numbers of documents represented are not uniform, particularly given the challenges of dating, but they are reasonably comparable. Although it is possible to split the reign of Alexander III along similar lines, there are simply so few charters that it becomes difficult to compare these time slices with the earlier ones. Kept together, however, it is at least possible to compare Alexander III's reign with the previous time slices. There is also an argument to be made that Alexander II's reign should be split into only two time slices of roughly 18 years each, given that that would produce a closer equivalency in document numbers to the William I time slices. This has not yet been achieved but should be considered a desideratum. All of these studies are restricted to the five specified document types of charter, charter/brieve, notification, agreement and settlement.

Table 5.36 Reigns and Time Slices

King	Time period	Length*	Documents	Witnesses
David I	1124-1153	29	83	172
Malcolm IV	1153-1165	12	88	157
William I	1165-1241	49	405	394
William I (T1)	1165-1178	13	128	184
William I (T2)	1178-1195	17	156	198
William I (T3)	1195-1214	19	134	184
Alexander II	1214-1249	35	277	286
Alexander II (T1)	1214-1225	11	107	122
Alexander II (T2)	1225-1236	11	123	170
Alexander II (T3)	1236-1249	13	68	121
Alexander III	1249-1286	37	67	130

\*Lengths of reigns have been rounded

## WILLIAM I, TIME SLICE 1 (1165-78)

There are 128 documents in this time slice, representing documents of King William I which were definitely or possibly produced between 1165 and 1178. These include one settlement, two notifications, and the rest charters proper, out of a potential 145 sources of the five specified types. Of these, 120 were definitely dated to the period between 1165 and 1178, while a further eight were possibly within that period. There are 184 witnesses in this study. The only woman was [95] Ada de Warenne (d.1178), countess of Northumberland.

Table 5.37. Top 15 actors by degree (churchmen in italics)

Poms ID	Name	Degree	Eigenvector Centrality	Betweenness Centrality	Weighted Degree
3	Walter Stewart (I), son of Alan (d.1177)	124	1	1517.562	437
112	Richard de Moreville (d.1189 or 1190)	115	0.919631	1103.907	461
13	Duncan (II), earl of Fife (d.1204)	113	0.97665	853.8823	408
114	Richard Comyn (d.c.1179)	105	0.939849	751.0653	254
2	<i>Matthew, bishop of Aberdeen (d.1199)</i>	104	0.931619	676.667	379
6	Walter Barclay, chamberlain (d.c.1193)	102	0.882081	646.8202	373
202	<i>Andrew, bishop of Caithness (d.1184)</i>	92	0.822762	653.0526	269
78	<i>Walter de Bidun, chancellor (d.1178)</i>	86	0.696778	806.9346	232
133	<i>Nicholas of Roxburgh, chancellor (d.1171?)</i>	85	0.799633	509.6794	391
781	<i>Richard of Lincoln, bishop of Moray (d.1203)</i>	85	0.671281	979.3535	157
4	Ness, son of William, lord of Leuchars (d.1178x83)	84	0.804328	371.039	243
1077	William de Mortimer (12C)	80	0.786225	346.226	201
24	William Hay (I), lord of Errol (d.c.1201)	79	0.746649	349.1827	244
204	Waltheof, earl of Dunbar (d.1182)	77	0.719199	343.5663	208
750	Robert Barclay, brother of Walter	75	0.71512	405.5527	163

Table 5.38. Top 15 actors by eigenvector (churchmen in italics)

Poms ID	Name	Degree	Eigenvector Centrality
3	Walter Stewart (I), son of Alan (d.1177)	124	1
13	Duncan (II), earl of Fife (d.1204)	113	0.97665
114	Richard Comyn (d.c.1179)	105	0.939849
2	<i>Matthew, bishop of Aberdeen (d.1199)</i>	104	0.931619
112	Richard de Moreville (d.1189 or 1190)	115	0.919631

<b>6</b>	Walter Barclay, chamberlain (d.c.1193)	102	0.882081
<b>202</b>	<i>Andrew, bishop of Caithness (d.1184)</i>	92	0.822762
<b>4</b>	Ness, son of William, lord of Leuchars (d.1178x83)	84	0.804328
<b>133</b>	<i>Nicholas of Roxburgh, chancellor (d.1171?)</i>	85	0.799633
<b>1077</b>	William de Mortimer (12C)	80	0.786225
<b>24</b>	William Hay (I), lord of Errol (d.c.1201)	79	0.746649
<b>14</b>	Robert de Quincy (d.1200)	69	0.739285
<b>204</b>	Waltheof, earl of Dunbar (d.1182)	77	0.719199
<b>750</b>	Robert Barclay, brother of Walter	75	0.71512
<b>185</b>	Geoffrey (I) Melville	65	0.700274

There is a good deal of continuity between the reign of Malcolm IV (1153-65) and the first period of King William's reign, which is of a similar length (1165-1178). The steward, [3] Walter son of Alan (d. 1177), the constable [112] Richard de Moreville (d. 1189/90), and the chancellor [133] Nicholas of Roxburgh continued in office. Malcolm's religious advisor, Abbot Osbert of Jedburgh, however, has lost his central position. [13] The Eigenvector calculations in particular show that churchmen are becoming less central. [2] Matthew, bishop of Aberdeen, until 1172 archdeacon of St Andrews, is very well connected, and court bishop [202] Andrew of Caithness is the other cleric of note who is not a bureaucrat. The young Earl Duncan (II) of Fife (d. 1204) is gaining in importance, and there is more emphasis on barons like [114] Richard Comyn, [4] Ness son of William, [1077] William de Mortimer, [14 Robert de Quincy, and [185 Geoffrey Melville. [6] Walter Barclay, a key figure, became chamberlain around 1171, and his brother Robert was also an important royal witness. Richard Comyn acted as a king's justice in the 1170s. [24] William Hay was the king's butler in the 1160s but appears with the title for the last time around 1172. The title was eventually resumed by William's son, Malcolm.

Table 5.39. Positions held by top actors (churchmen in italics)

Poms ID	Name	Position
3	Walter Stewart (I), son of Alan (d.1177)	Steward
112	Richard de Moreville (d.1189 or 1190)	Constable
13	Duncan (II), earl of Fife (d.1204)	Earl of Fife
114	Richard Comyn (d.c.1179)	Justice
2	<i>Matthew, bishop of Aberdeen (d.1199)</i>	Archdeacon of St Andrews
6	Walter Barclay, chamberlain (d.c.1193)	Chamberlain (ca 1171-ca1193)
202	<i>Andrew, bishop of Caithness (d.1184)</i>	'court bishop'

78	<i>Walter de Bidun (d.1178)</i>	Chancellor (1171-78)
133	<i>Nicholas of Roxburgh, chancellor (d.1171?)</i>	Chancellor (1165-71)
781	<i>Richard of Lincoln, bishop of Moray (d.1203)</i>	King's clerk
4	Ness, son of William, lord of Leuchars (d.1178x83)	-
1077	William de Mortimer (12C)	-
24	William Hay (I), lord of Errol (d.c.1201)	Butler
204	Waltheof, earl of Dunbar (d.1182)	Earl of Dunbar
750	Robert Barclay, brother of Walter	

Table 5.40. Documents witnessed by top actors

ID	Person	#WT1 docs witnessed	% WT1 docs witnessed	Charters/ year (13 years)	Degree/ docs witnessed
3	Walter Stewart (I), son of Alan (d.1177)	49	38%	3.8	2.53
112	Richard de Moreville (d.1189 or 1190)	52	41%	4.1	2.21
13	Duncan (II), earl of Fife (d.1204)	44	34%	3.4	2.57
114	Richard Comyn (d.c.1179)	27	21%	2.1	3.89
2	Matthew, bishop of Aberdeen (d.1199)	43	34%	3.3	2.42
6	Walter Barclay, chamberlain (d.c.1193)	38	30%	2.9	2.68

Tables 5.40 and 5.41 allow us to consider the top actors in terms of how many documents they witnessed. The steward and the chamberlain witnessed 41 and 38 percent of the documents, respectively, while Richard Comyn only witnessed 21. In general, those who witnessed the most documents in this period (see Table 5.41) were also the highest in the league tables for centrality. Richard Comyn had high centrality numbers for his relatively low number of charters witnessed, while the king's brother, [142] David earl of Huntingdon witnessed 23 documents (18%), but did not appear in the top 15 actors by degree or eigenvector. Richard Comyn's degree divided by documents witnessed was much higher than the other five top players, at 3.89 (see Table 5.40). David Oliphant, another justice, had a degree of just 58, but witnessed more documents than Comyn. His quotient is much lower than Comyn's, at 1.87. Earl David had a degree of 73 and witnessed 23 documents: his quotient is 3.17. Earl David had, for the small number of documents he witnessed, more contacts than Richard Comyn, but fewer than David Oliphant.

Table 5.41. Numbers of documents (SD) witnessed (15 or more)

PoMS ID	Name	Docs witnessed
<b>133</b>	Nicholas of Roxburgh, chancellor (d.1171?)	53
<b>112</b>	Richard de Moreville (d.1189 or 1190)	52
<b>3</b>	Walter Stewart (I), son of Alan (d.1177)	49
<b>13</b>	Duncan (II), earl of Fife (d.1204)	44
<b>2</b>	Matthew, bishop of Aberdeen (d.1199)	43
<b>6</b>	Walter Barclay, chamberlain (d.c.1193)	38
<b>202</b>	Andrew, bishop of Caithness (d.1184)	32
<b>83</b>	David Oliphant (12C)	31
<b>78</b>	Walter de Bidun (d.1178)	30
<b>15</b>	Philip de Valognes, chamberlain (d.1215)	28
<b>114</b>	Richard Comyn (d.c.1179)	27
<b>4</b>	Ness, son of William, lord of Leuchars (d.1178x83)	24
<b>142</b>	David, earl of Huntingdon (d.1219)	23
<b>24</b>	William Hay (I), lord of Errol (d.c.1201)	23
<b>204</b>	Waltheof, earl of Dunbar (d.1182)	22
<b>1077</b>	William de Mortimer (12C)	18
<b>154</b>	Robert Avenel, lord of Eskdale (d.1185)	17
<b>750</b>	Robert Barclay, brother of Walter	17
<b>14</b>	Robert de Quincy (d.1200)	17
<b>143</b>	Ingram, bishop of Glasgow (d.1174)	17
<b>781</b>	Richard of Lincoln, bishop of Moray (d.1203)	15
<b>185</b>	Geoffrey (I) Melville	15

The most productive co-witnessing pairs mostly involved the chancellor Nicholas of Roxburgh, the steward Walter son of Alan, and the constable Richard de Moreville. The other top pairs were various combinations of the individuals we have already encountered in the degree and eigenvector tables. The chief exception to this was David Oliphant, a royal justice in the earlier half of our period. He witnessed 31 documents in total, including 28 with Nicholas the chancellor and 18 with Walter the steward. Again this suggests that David Oliphant was a significant player despite being lower down in the centrality league tables.

Table 5.40. Pairs who witnessed together 15 or more times

Person 1	Person 2	#docs
Nicholas of Roxburgh, chancellor (d.1171?)	Walter Stewart (I), son of Alan (d.1177)	34
Richard de Moreville (d.1189 or 1190)	Walter Stewart (I), son of Alan (d.1177)	29
Nicholas of Roxburgh, chancellor (d.1171?)	David Oliphant (12C)	28
Nicholas of Roxburgh, chancellor (d.1171?)	Richard de Moreville (d.1189 or 1190)	24
Walter Stewart (I), son of Alan (d.1177)	Matthew, bishop of Aberdeen (d.1199)	23
Matthew, bishop of Aberdeen (d.1199)	Duncan (II), earl of Fife (d.1204)	22
Nicholas of Roxburgh, chancellor (d.1171?)	Matthew, bishop of Aberdeen (d.1199)	21
Matthew, bishop of Aberdeen (d.1199)	Andrew, bishop of Caithness (d.1184)	21
Richard de Moreville (d.1189 or 1190)	Walter Barclay, chamberlain (d.c.1193)	19
Matthew, bishop of Aberdeen (d.1199)	Ness, son of William, lord of Leuchars (d.1178x83)	19
Richard de Moreville (d.1189 or 1190)	Duncan (II), earl of Fife (d.1204)	18
Walter Stewart (I), son of Alan (d.1177)	David Oliphant (12C)	18
Matthew, bishop of Aberdeen (d.1199)	Walter Barclay, chamberlain (d.c.1193)	18
Duncan (II), earl of Fife (d.1204)	Andrew, bishop of Caithness (d.1184)	18
Richard de Moreville (d.1189 or 1190)	Matthew, bishop of Aberdeen (d.1199)	17
Richard de Moreville (d.1189 or 1190)	Philip de Valognes, chamberlain (d.1215)	17
Duncan (II), earl of Fife (d.1204)	Walter Barclay, chamberlain (d.c.1193)	17
Duncan (II), earl of Fife (d.1204)	Walter de Bidun (d.1178)	17
Richard de Moreville (d.1189 or 1190)	David Oliphant (12C)	15
Duncan (II), earl of Fife (d.1204)	Ness, son of William, lord of Leuchars (d.1178x83)	15

Figure 5.116. Netdraw. William T1, all witnesses

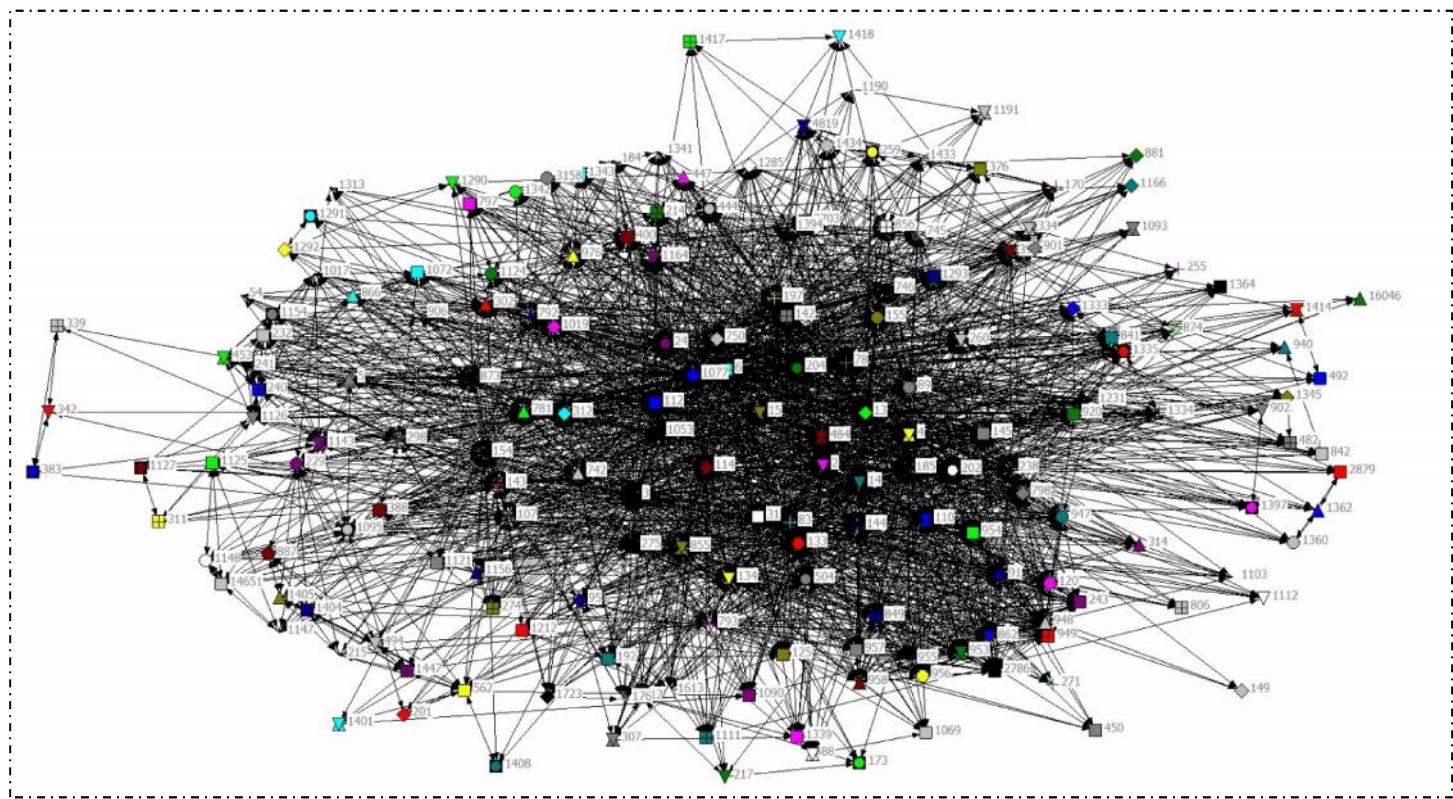


Figure 5.117. Netdraw. William T1, more than 5 co-witnessing acts

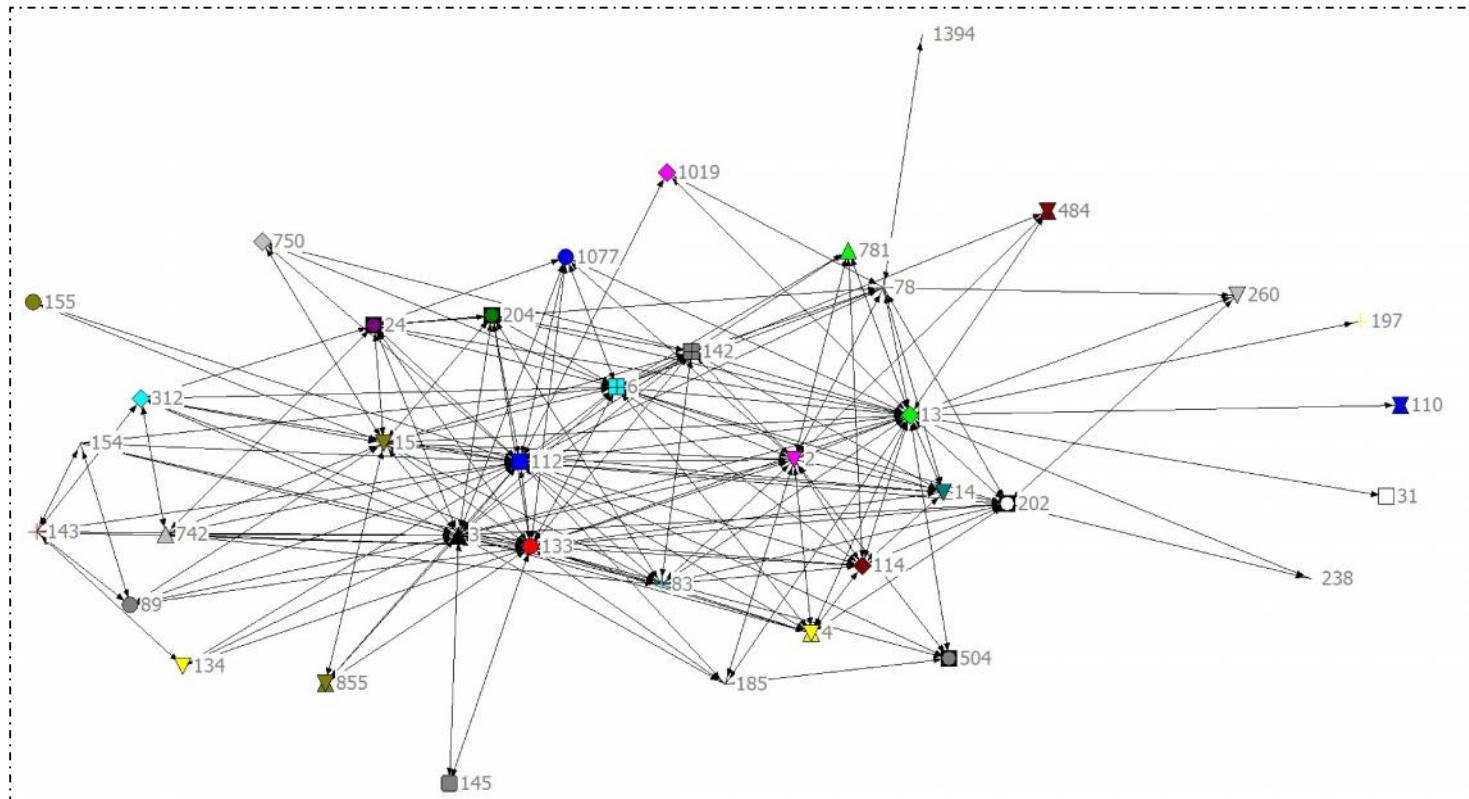


Figure 5.118. Netdraw. William T1, more than 10 co-witnessing acts

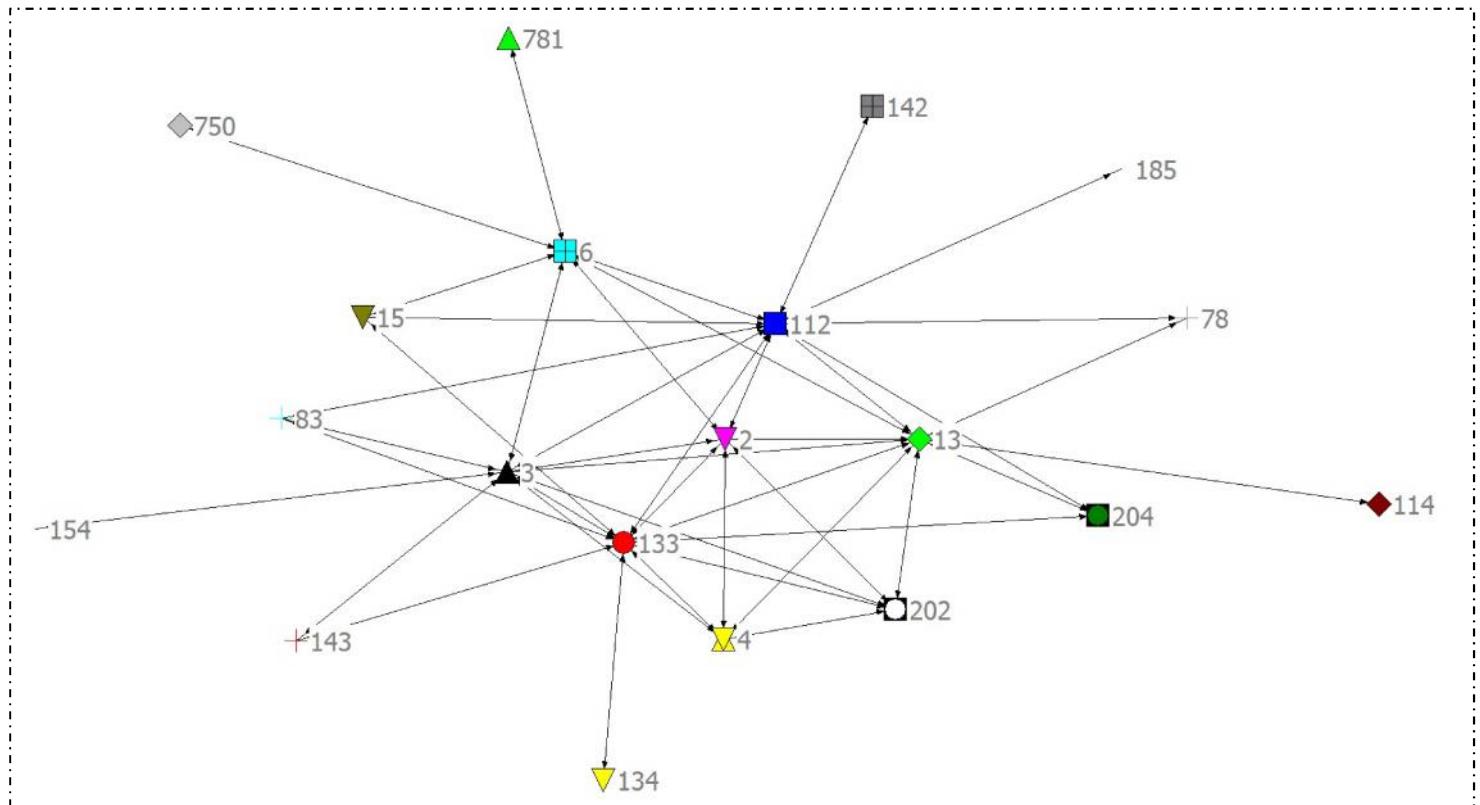
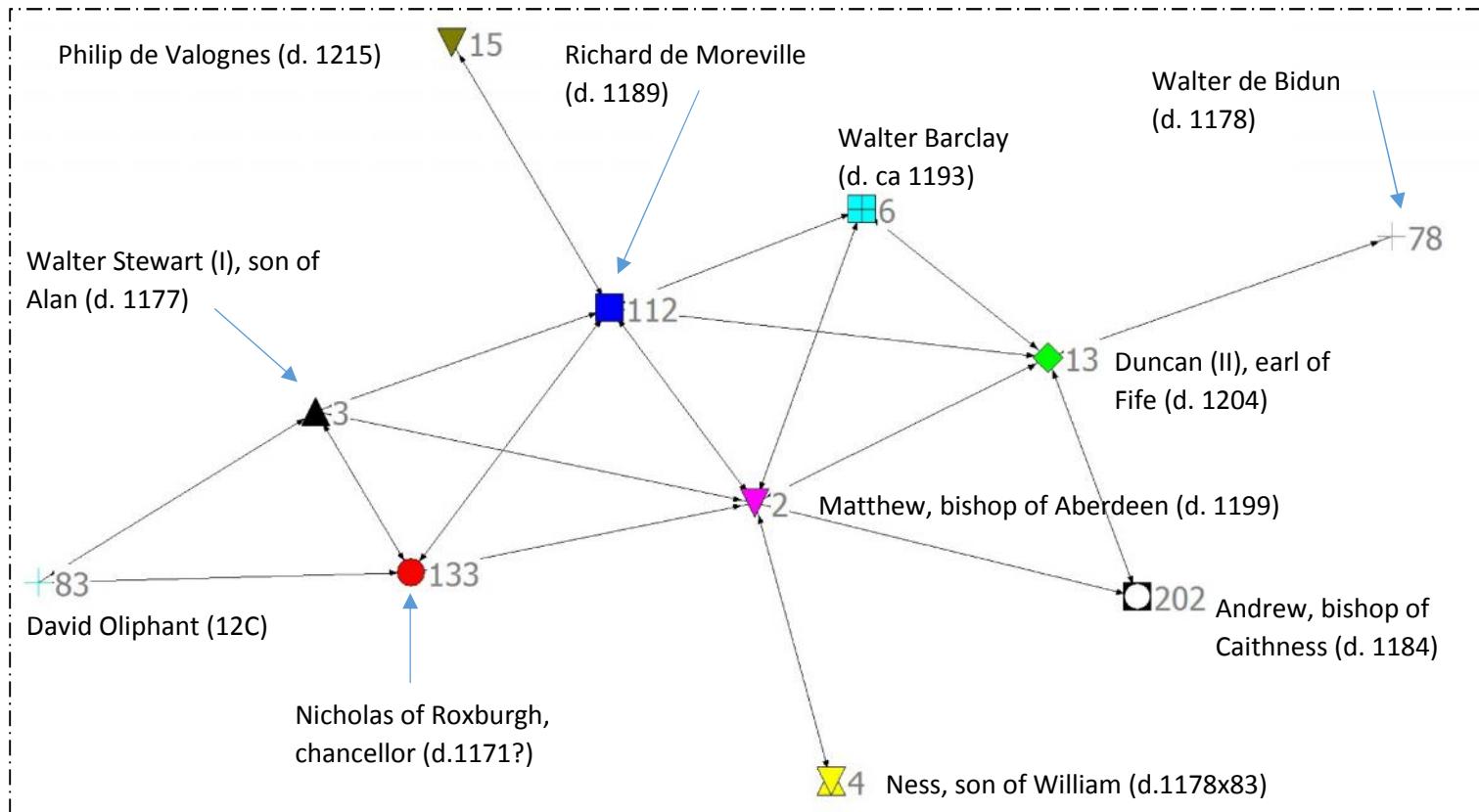


Figure 5.119. Netdraw. William T1, more than 15 co-witnessing acts



We can see the top players in the years 1165-78 and their interconnections in the sociograms of co-witnessing more than 15 times. (Figures 5.119 and 5.120). The figures who were more important in the earlier part of the period appear on the left. The chancellor Nicholas of Roxburgh died in 1171 and David Oliphant was a royal justice up to about the same time. We have two 4-person cliques in this sociogram, one involving Walter, Nicholas, Richard de Moreville and Bishop Matthew, the other involving the two latter figures as well as Duncan earl of Fife and the chamberlain Walter Barclay. We have a triad of Bishop Matthew, Earl Duncan and Bishop Andrew: these were all individuals who were based in Fife and surrounding regions. People who were more important in the later period – Walter de Bidun, who was chancellor from 1171 to 1178, and Walter Barclay, who became chamberlain in the 1170s, appear toward the right of the sociogram. Figure 5.120 shows the number of times each pair of nodes witnessed together. For example, [15] Philip de Valognes and [112] Richard de Moreville witnessed alongside one another 17 times.

Figure 5.120. Netdraw. William T1, more than 15 co-witnessing acts, edges labelled

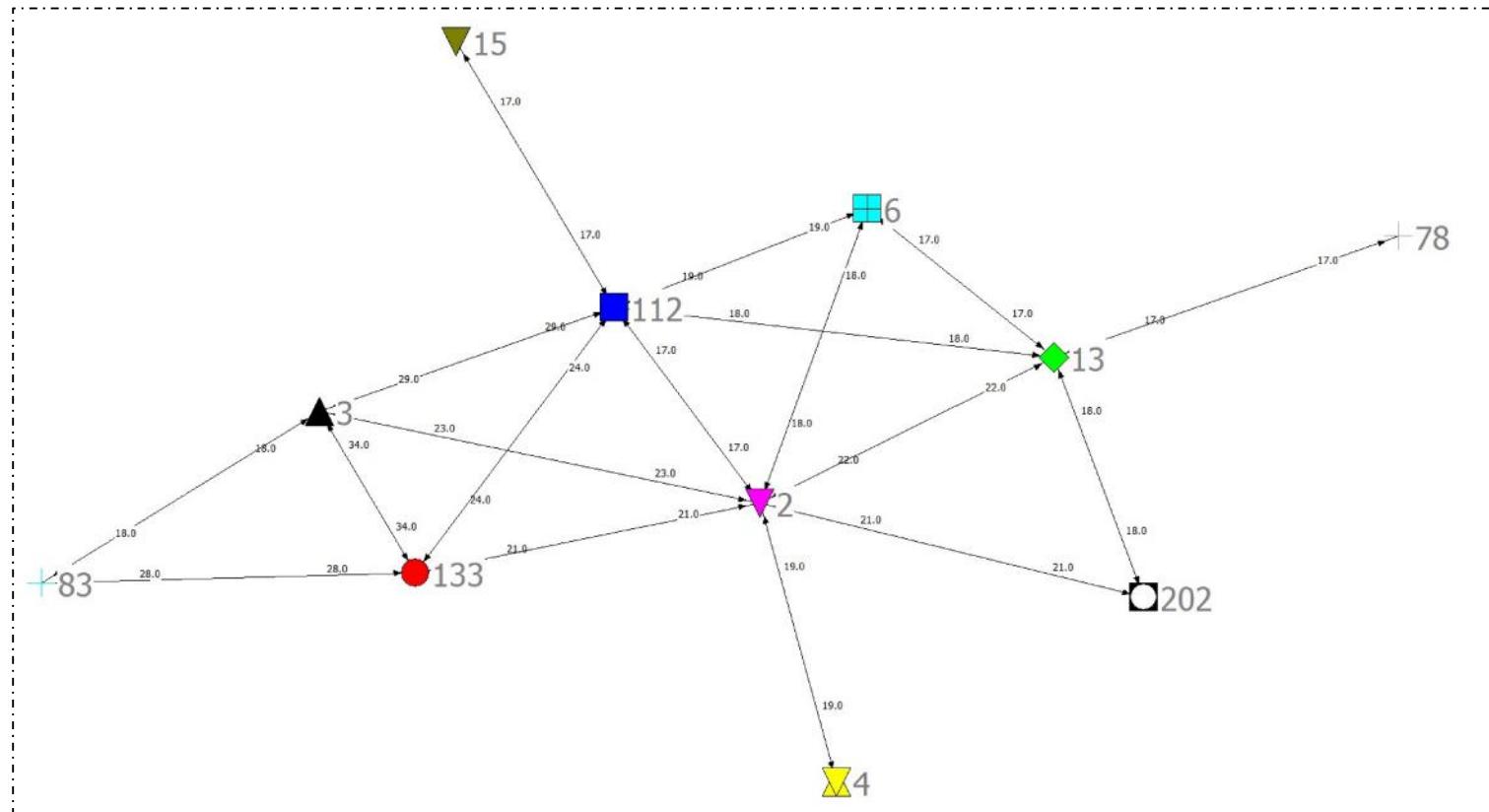
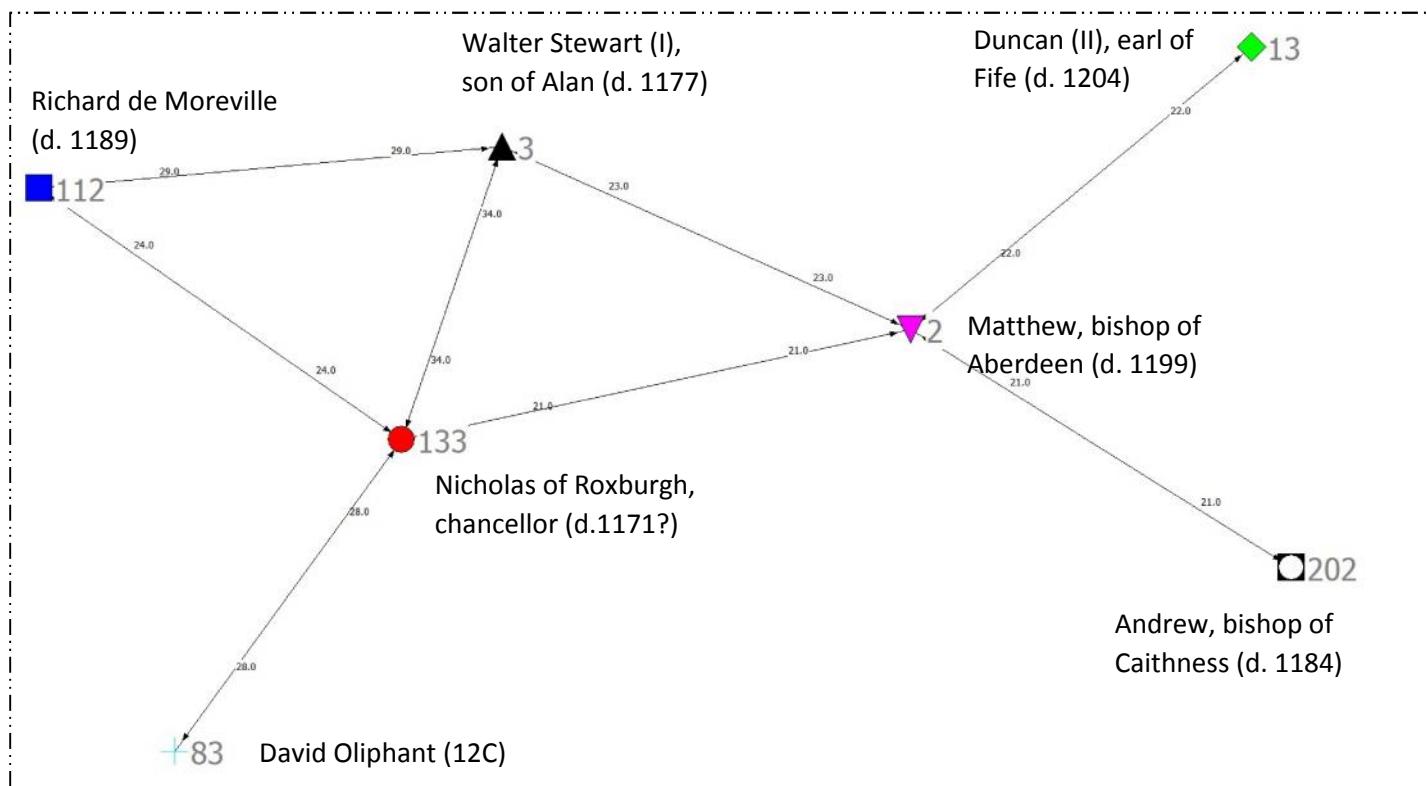


Figure 5.121. Netdraw. William T1, more than 20 co-witnessing acts, edges labelled



The following series of Gephi sociograms (Figures 5.122 to 128) shows the immediate connections of some of the key actors, at the level of ten or more co-witnessing acts. It is noteworthy that Richard Comyn is only connected to three others at this level. Similarly, David Oliphant was connected to only three other actors. Both were connected to Nicholas the chancellor and Walter son of Alan the steward. Thus, although these individuals had relatively large networks of 'contacts', based on witnessing together, these connections appear to have been more 'shallow' than those of some of their contemporaries.

Figure 5.122. Gephi: 10 or more, [3] Walter son of Alan connections

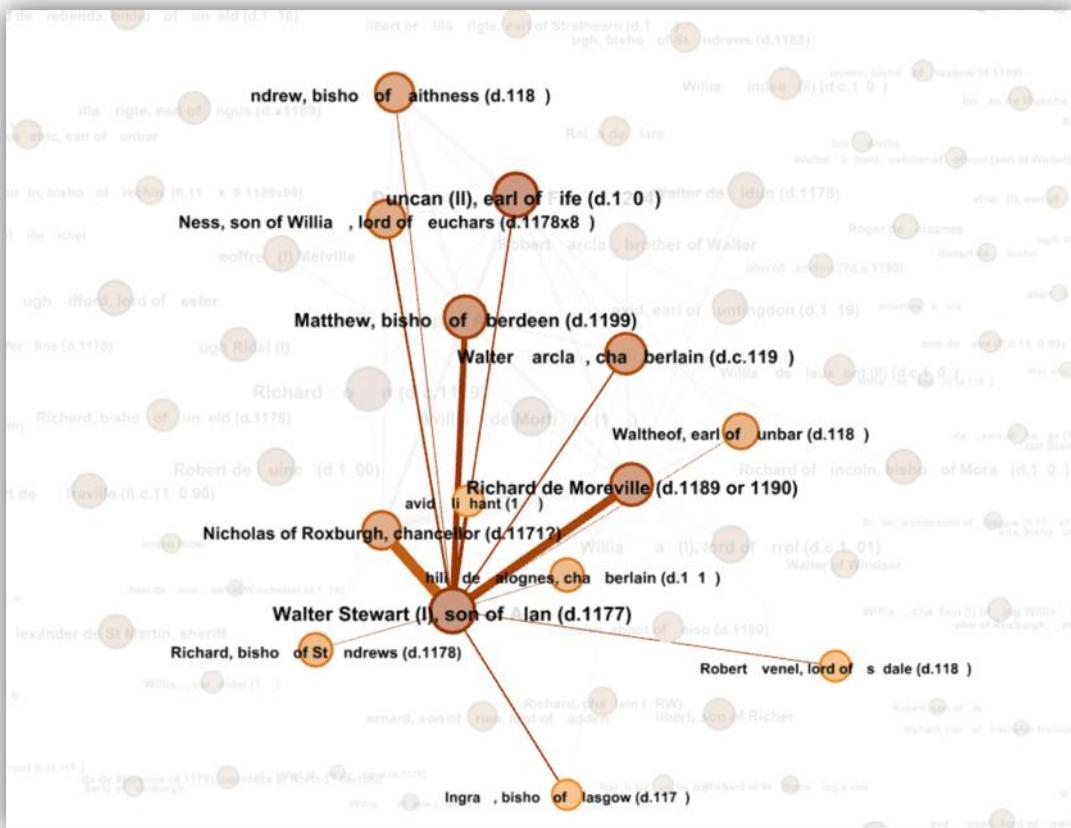


Figure 5.123. Gephi: 10 or more, [112] Richard de Moreville connections

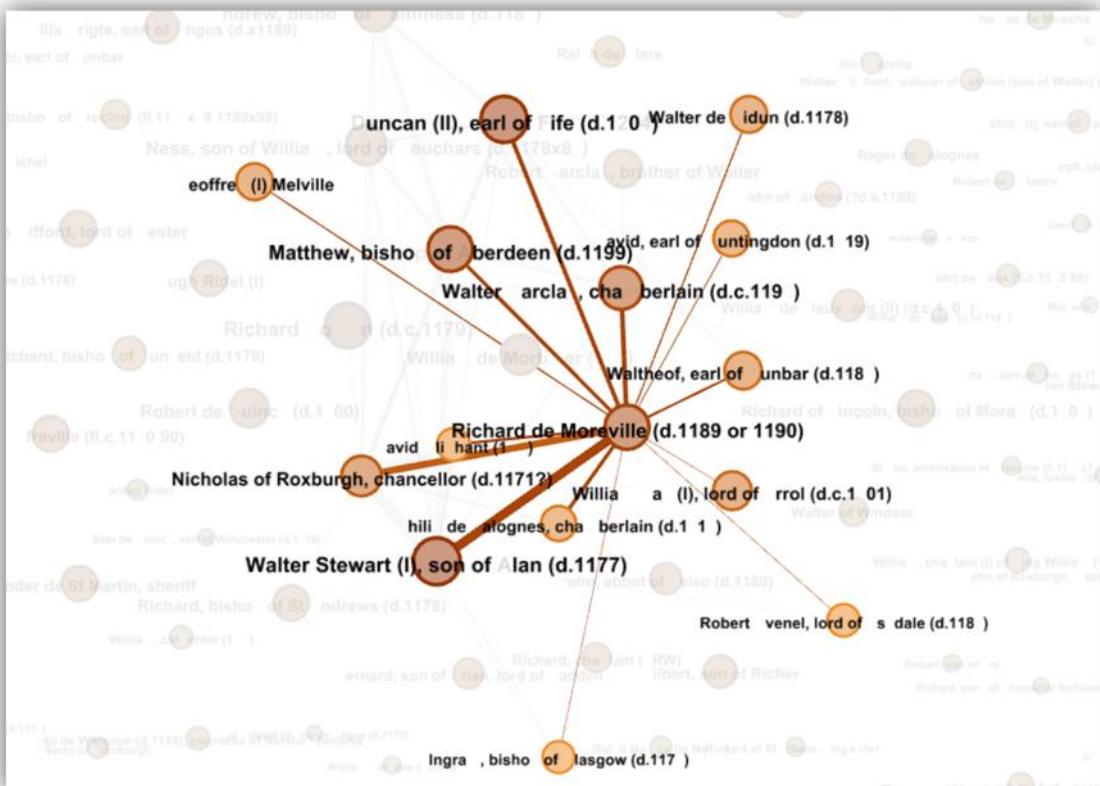


Figure 5.124. Gephi: 10 or more, [2] Matthew, bishop of Aberdeen connections

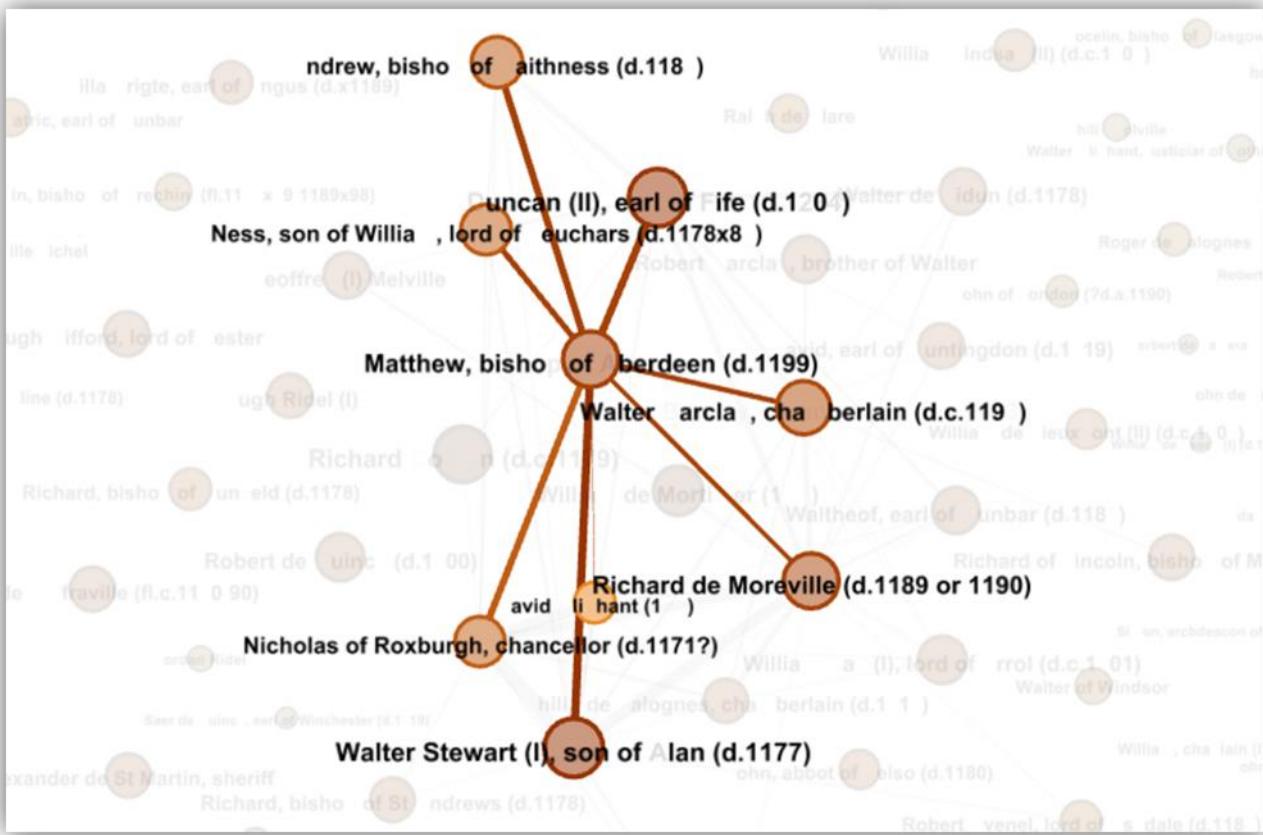


Figure 5.125. Gephi: 10 or more, [13] Duncan (II), earl of Fife

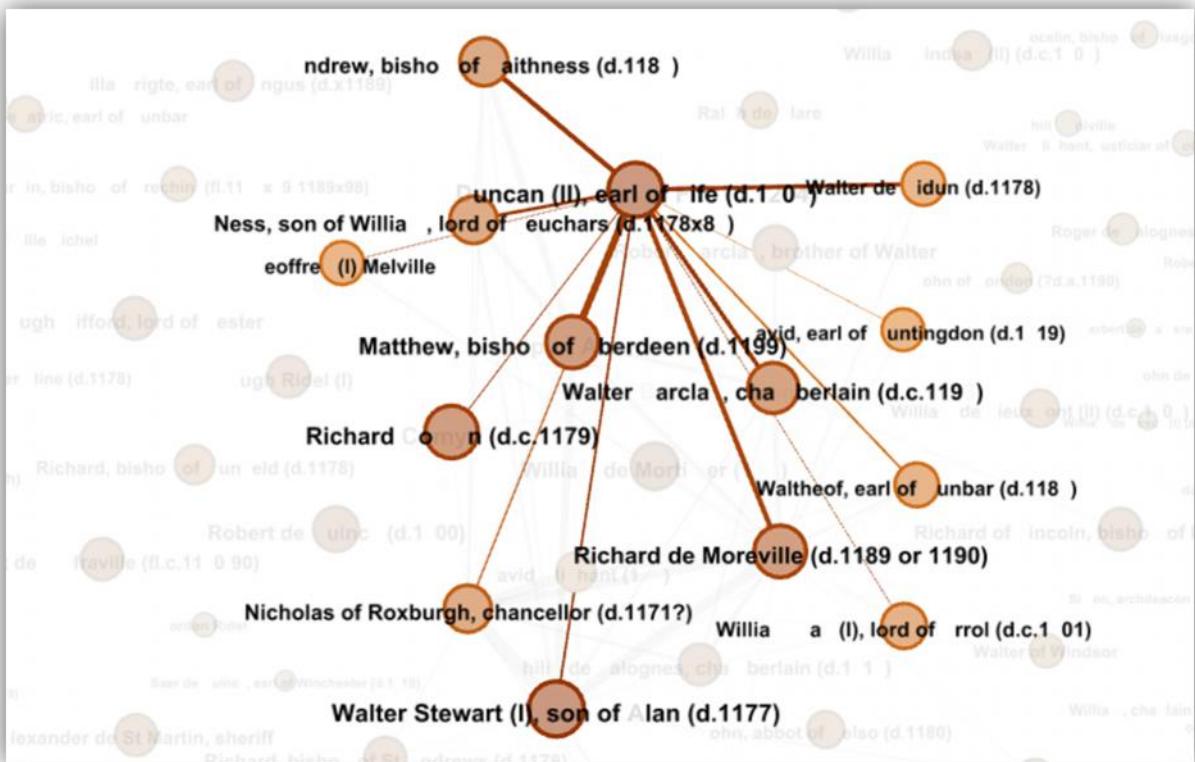


Figure 5.126. Gephi: 10 or more: Richard Comyn connections

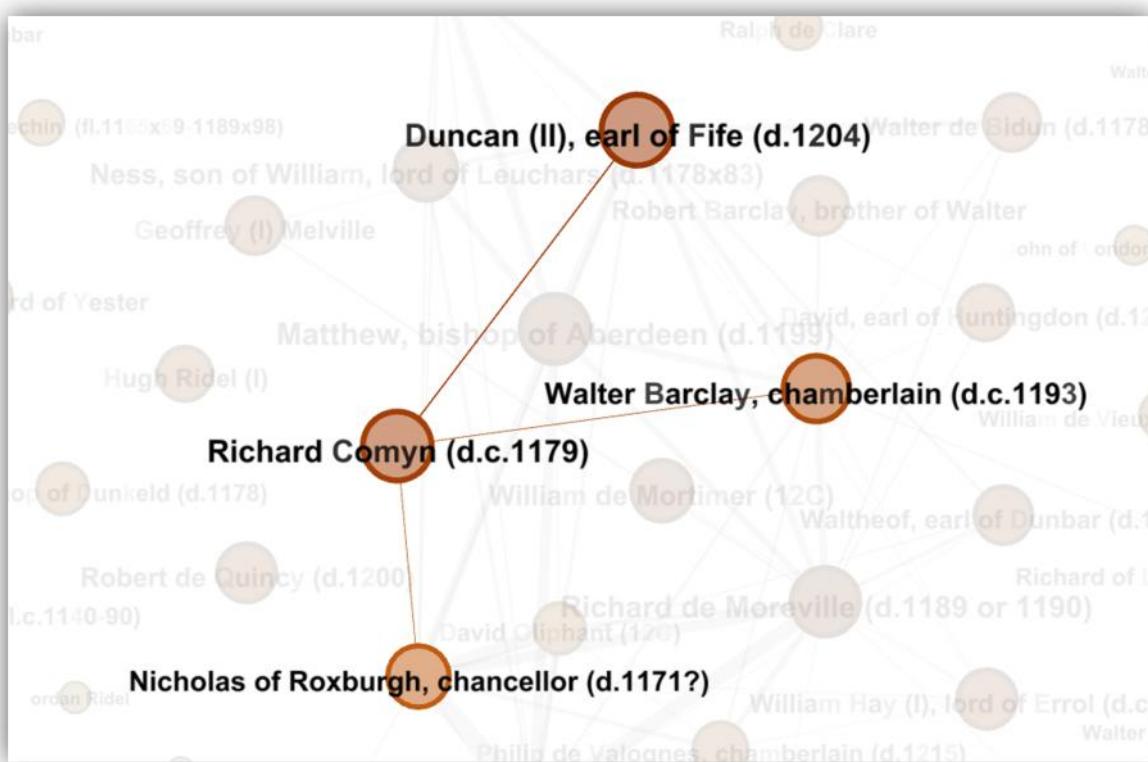


Figure 5.127. Gephi: 10 or more: [6] Walter Barclay connections

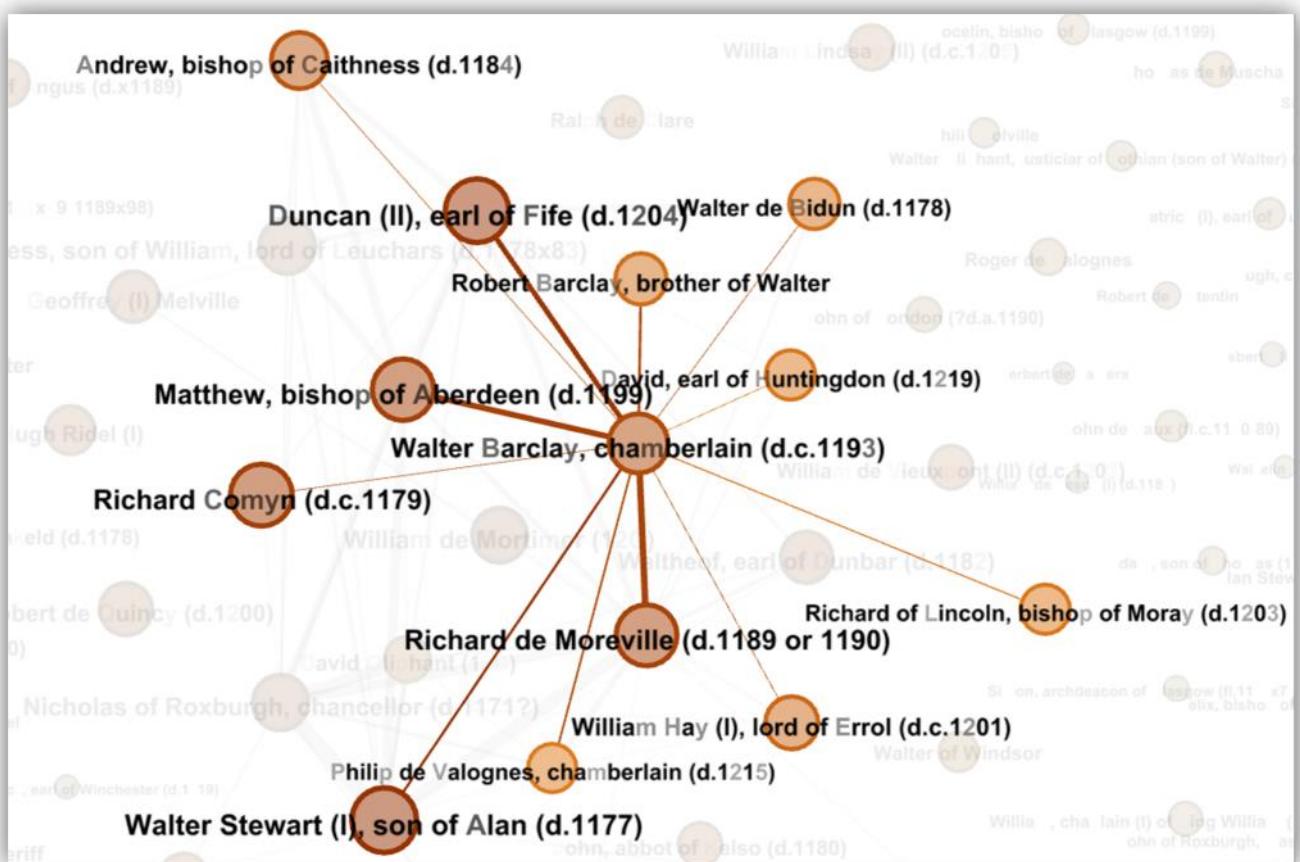


Figure 5.128. Gephi: 10 or more: David Oliphant connections

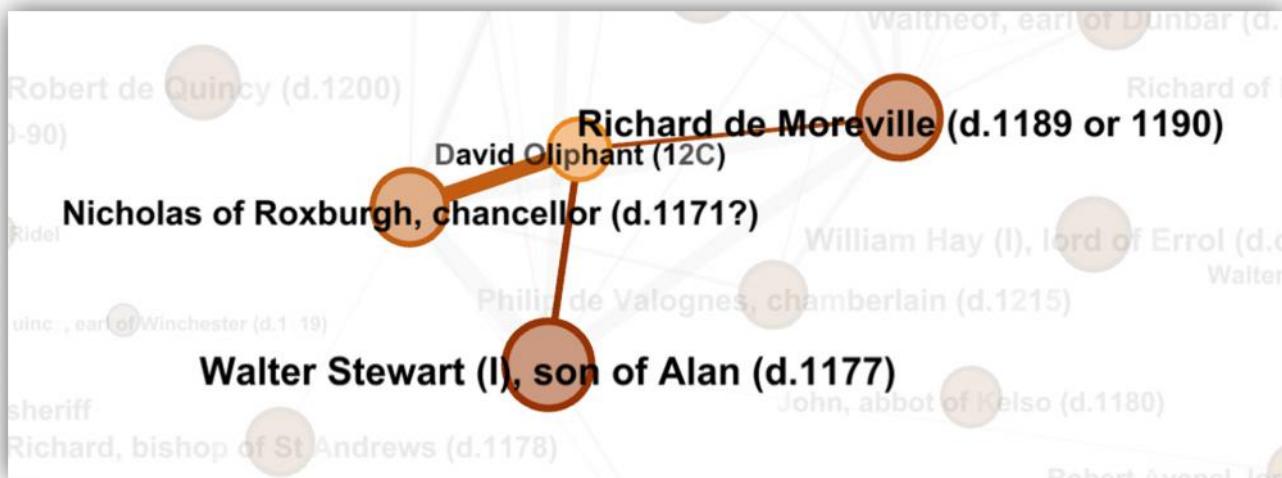
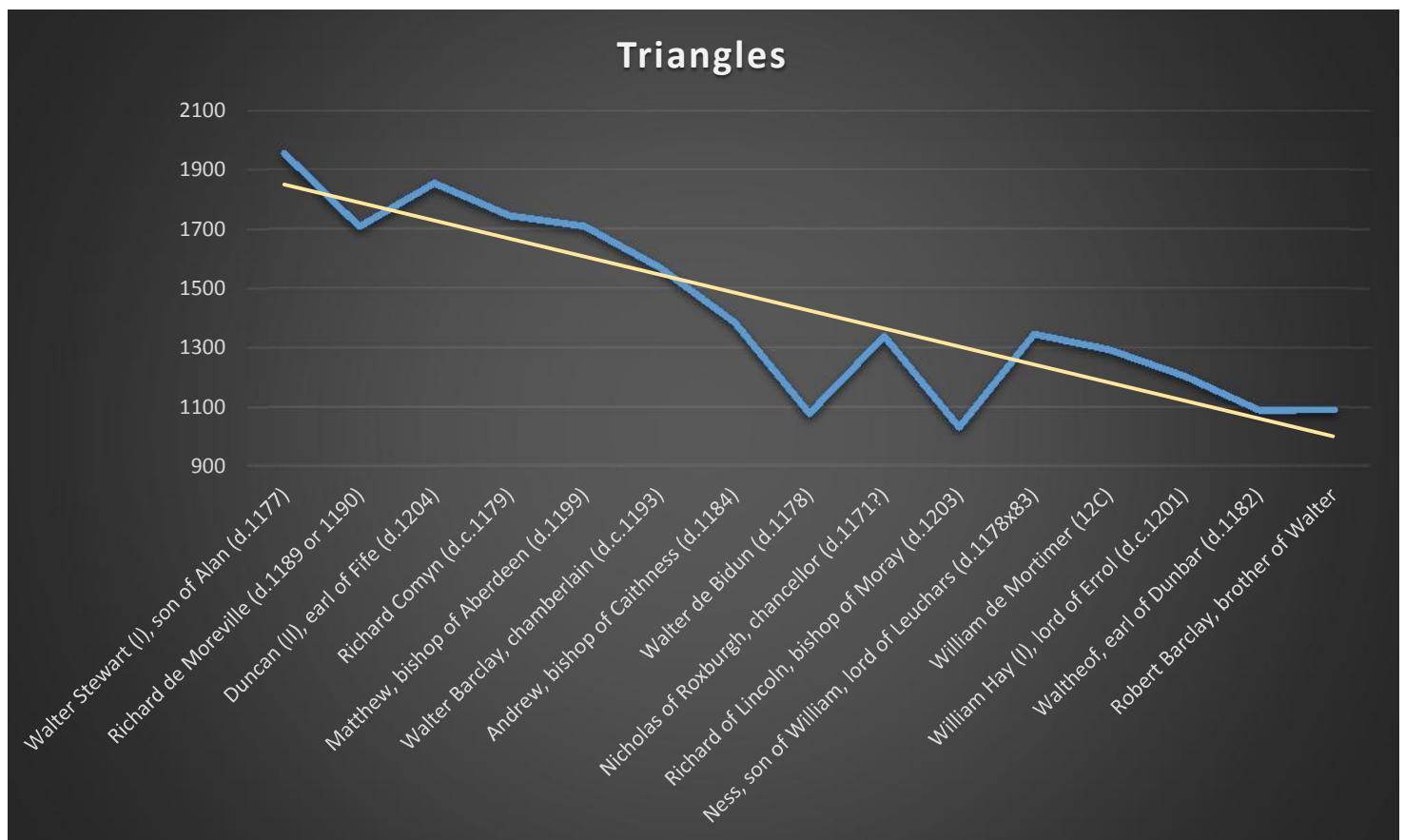


Figure 5.128. Top 15 by degree, number of triangles



## WILLIAM I, TIME SLICE 2 (1178-95)

The second time slice from William's reign spans the period from 1178 to 1195. 1178 was the year when chancellor Walter de Bidun died, and when William's chaplain Hugh was elected to the bishroprie of St Andrews against the objections of the Augustinian cathedral chapter. There was no chancellor for the next decade, when Hugh's successor Roger was given the position. 1178 was also the year of the foundation of King William's new monastery at Arbroath. 1195 was the year when the date of time was introduced to royal acts. These are the reasons these dates were selected. There are 156 documents out of a potential 171 documents in this study. There were one charter/brieve, one settlement, and the rest were charters. 130 of the documents were definitely dated to period 1178-1195, and a further 26 were possibly dated to that period. There are 198 witnesses in this study, all male, and 3287 edges.

Table 5.41. Top 15 actors by degree (churchmen in italics)

poms id	name	degree	eigenvector	betweeness
13	Duncan (II), earl of Fife (d.1204)	149	1	1929.503
260	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	128	0.938138	1008.688
15	Philip de Valognes, chamberlain (d.1215)	124	0.903786	1084.426
24	William Hay (I), lord of Errol (d.c.1201)	113	0.87606	685.8008
197	William Lindsay (II) (d.c.1205)	112	0.882522	588.1052
798	<i>Richard de Prebenda, bishop of Dunkeld (d.1210)</i>	112	0.817943	871.7476
400	Alan Stewart, son of Walter (d.1204)	107	0.836935	635.68
820	<i>Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)</i>	107	0.754759	819.3303
419	<i>Archibald, abbot of Dunfermline (d.1198)</i>	104	0.839333	420.045
142	David, earl of Huntingdon (d.1219)	104	0.816378	615.7886
6	Walter Barclay, chamberlain (d.c.1193)	102	0.826199	534.6975
14	Robert de Quincy (d.1200)	101	0.773513	685.9405
310	William de Moreville (d.1196)	100	0.83126	383.2342
782	Malcolm (I), earl of Fife (d.1229)	95	0.752754	485.3509
16	William Comyn, earl of Buchan (d.1233)	95	0.755988	455.1584
797	<i>Robert, archdeacon of Glasgow (d.1222)</i>	94	0.746007	520.1557
745	<i>Jocelin, bishop of Glasgow (d.1199)</i>	92	0.805596	235.9628
2	<i>Matthew, bishop of Aberdeen (d.1199)</i>	92	0.760338	390.8103
750	Robert Barclay, brother of Walter	79	0.681082	278.1113
112	Richard de Moreville (d.1189 or 1190)	76	0.667431	220.4746

Table 5.42. Top 15 actors by eigenvector (churchmen in italics)

poms id	name	degree	eigenvector
13	Duncan (II), earl of Fife (d.1204)	149	1
260	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	128	0.938138
15	Philip de Valognes, chamberlain (d.1215)	124	0.903786
197	William Lindsay (II) (d.c.1205)	112	0.882522
24	William Hay (I), lord of Errol (d.c.1201)	113	0.87606
419	<i>Archibald, abbot of Dunfermline (d.1198)</i>	104	0.839333
400	Alan Stewart, son of Walter (d.1204)	107	0.836935
310	William de Moreville (d.1196)	100	0.83126
6	Walter Barclay, chamberlain (d.c.1193)	102	0.826199
798	<i>Richard de Prebenda, bishop of Dunkeld (d.1210)</i>	112	0.817943
142	David, earl of Huntingdon (d.1219)	104	0.816378
745	<i>Jocelin, bishop of Glasgow (d.1199)</i>	92	0.805596
14	Robert de Quincy (d.1200)	101	0.773513
2	<i>Matthew, bishop of Aberdeen (d.1199)</i>	92	0.760338
16	William Comyn, earl of Buchan (d.1233)	95	0.755988
820	<i>Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)</i>	107	0.754759
782	Malcolm (I), earl of Fife (d.1229)	95	0.752754
797	<i>Robert, archdeacon of Glasgow (d.1222)</i>	94	0.746007
750	Robert Barclay, brother of Walter	79	0.681082
112	Richard de Moreville (d.1189 or 1190)	76	0.667431

The period from 1178 to 1195 marks a clear shift away from the dominant order of Malcolm's reign and the first part of William's. [14] Duncan (II), earl of Fife (d. 1204) has moved up an unequivocal top position in both degree and eigenvector. He also had by far the highest betweenness centrality, suggesting he held a pivotal position in the network in terms of a broker or conduit for power and influence. Earl Duncan also witnessed by far more documents than the other main actors (see Table 5.44). Duncan had become a royal justice in the early 1170s and held this position throughout. [260] Gilbert or Gilla Brigte, earl of Stathearn (d. 1223) has risen to the second position in both degree and eigenvector, with an eigenvector score of 93.8% of Duncan's. Despite the fact that he gave up the chamberlainship in the early 1170s and did not take it up again until near the end of our period, [15] Philip de Valognes (d. 1215) continued to be one of the most powerful and influential players. Walter Barclay, who was chamberlain until his death around 1193, was less influential, with an eigenvector score of 82.6% that of Earl Duncan. The stock of [2] Matthew, bishop of Aberdeen from 1172 to 1199, has also fallen greatly from the T1 period. The top religious advisor is [419] Archibald, abbot of

Dunfermline (d. 1198). Walter Stewart (I)'s son [400] Alan, who became steward after his father's death in 1177, has an eigenvector score of 83.7 that of Earl Duncan, but is clearly in a less important position than that held by his father. Further, the position of [112] Richard de Moreville, the constable, has fallen greatly since the earlier period, and his son [310] William de Moreville was less central than his father. Four of the top five actors – Earl Duncan, Earl Gilbert, Philip de Valognes, and [24] William Hay, lord of Errol, were landholders in middle Scotland, with Hay holding Errol close to both Fife and Strathearn, and Valognes holding the nearby lordships of Benvie and Panmure, in Angus. The most central figure based in Lothian was [197] William Lindsay (II) (d. ca 1205), lord of Crawford, and a royal justice in later part of T2. New figures to emerge in this period were Richard Comyn's son [16] William Comyn and Earl Duncan's son [782] Malcolm.

Table 5.43. Positions held by top actors (churchmen in italics)

PoMS ID	Name	Position
13	Duncan (II), earl of Fife (d.1204)	Justice
260	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	Justice
15	Philip de Valognes, chamberlain (d.1215)	Chamberlain (ca 1193-1215)
24	William Hay (I), lord of Errol (d.c.1201)	Butler
197	William Lindsay (II) (d.c.1205)	Justice
798	<i>Richard de Prebenda, bishop of Dunkeld (d.1210)</i>	King's clerk
400	Alan Stewart, son of Walter (d.1204)	Steward
820	<i>Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)</i>	King's clerk, Chancellor (1189-99)
419	<i>Archibald, abbot of Dunfermline (d.1198)</i>	Advisor
142	David, earl of Huntingdon (d.1219)	King's brother
6	Walter Barclay, chamberlain (d.c.1193)	Chamberlain (ca 1171-ca1193)
14	Robert de Quincy (d.1200)	Justice
310	William de Moreville (d.1196)	Constable (1190-96)
782	Malcolm (I), earl of Fife (d.1229)	Son of Earl Duncan
16	William Comyn, earl of Buchan (d.1233)	Household knight?
797	<i>Robert, archdeacon of Glasgow (d.1222)</i>	archdeacon of Glasgow
745	<i>Jocelin, bishop of Glasgow (d.1199)</i>	bishop of Glasgow
2	<i>Matthew, bishop of Aberdeen (d.1199)</i>	Bishop of Aberdeen
750	Robert Barclay, brother of Walter	Brother of Walter Barclay
112	Richard de Moreville (d.1189 or 1190)	Constable (1162-89)

Earl Duncan (II) witnessed a remarkable 76 documents, nearly 50% of those in this T2 study, average nearly 4 and a half documents per year. He also had a very low quotient of degree divided by documents witnessed, of 1.96. This is impressive given that the size of his network of 'contacts' (his degree) was 21 larger than the next actor. Hugh of Roxburgh, the king's clerk who was appointed

chancellor in 1189, also witnessed a high percentage of documents (62 docs, just under 40%), and had a remarkably low quotient of 1.73.

Table 5.44. Documents witnessed by top actors

ID	Person	#WT2 docs witnessed	% WT2 docs witnessed	Docs/ year (17 years)	Degree/ docs witnessed
13	Duncan (II), earl of Fife (d.1204)	76	48.7%	4.47	1.96
260	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	52	33.3%	3.06	2.46
15	Philip de Valognes, chamberlain (d.1215)	47	30.1%	2.76	2.64
24	William Hay (I), lord of Errol (d.c.1201)	44	28.2%	2.59	2.57
197	William Lindsay (II) (d.c.1205)	49	31.4%	2.88	2.29
798	Richard de Prebenda, bishop of Dunkeld (d.1210)	39	25%	2.29	2.87
400	Alan Stewart, son of Walter (d.1204)	34	21.8%	2	3.15
820	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	62	39.7%	3.65	1.73

Table 5.45. Numbers of documents (SD) witnessed (22 or more)

PoMS ID	Name	Docs witnessed
13	Duncan (II), earl of Fife (d.1204)	76
820	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	62
260	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	52
197	William Lindsay (II) (d.c.1205)	49
15	Philip de Valognes, chamberlain (d.1215)	47
6	Walter Barclay, chamberlain (d.c.1193)	45
24	William Hay (I), lord of Errol (d.c.1201)	44
798	Richard de Prebenda, bishop of Dunkeld (d.1210)	39
112	Richard de Moreville (d.1189 or 1190)	35
400	Alan Stewart, son of Walter (d.1204)	34
142	David, earl of Huntingdon (d.1219)	33
419	Archibald, abbot of Dunfermline (d.1198)	32
16	William Comyn, earl of Buchan (d.1233)	31
782	Malcolm (I), earl of Fife (d.1229)	28
310	William de Moreville (d.1196)	28
797	Robert, archdeacon of Glasgow (d.1222)	28
14	Robert de Quincy (d.1200)	27
2	Matthew, bishop of Aberdeen (d.1199)	27
750	Robert Barclay, brother of Walter	26
746	Walter Oliphant, elder	23
307	Robert of London (d.1225)	23
745	Jocelin, bishop of Glasgow (d.1199)	22

Table 5.46. Pairs who witnessed together 18 or more times

Person 1	Person 2	#docs
Duncan (II), earl of Fife (d.1204)	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	47
Duncan (II), earl of Fife (d.1204)	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	33
Duncan (II), earl of Fife (d.1204)	William Hay (I), lord of Errol (d.c.1201)	27
Archibald, abbot of Dunfermline (d.1198)	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	27
Duncan (II), earl of Fife (d.1204)	William Lindsay (II) (d.c.1205)	24
William Lindsay (II) (d.c.1205)	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	24
William Hay (I), lord of Errol (d.c.1201)	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	23
Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	Richard de Prebenda, bishop of Dunkeld (d.1210)	23
Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	22
Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	William Comyn, earl of Buchan (d.1233)	22
Matthew, bishop of Aberdeen (d.1199)	Duncan (II), earl of Fife (d.1204)	21
Duncan (II), earl of Fife (d.1204)	Walter Barclay, chamberlain (d.c.1193)	21
Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	William Hay (I), lord of Errol (d.c.1201)	21
Duncan (II), earl of Fife (d.1204)	William Comyn, earl of Buchan (d.1233)	20
Richard de Moreville (d.1189 or 1190)	Walter Barclay, chamberlain (d.c.1193)	20
William Hay (I), lord of Errol (d.c.1201)	William Comyn, earl of Buchan (d.1233)	19
Duncan (II), earl of Fife (d.1204)	Philip de Valognes, chamberlain (d.1215)	18
Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	Malcolm (I), earl of Fife (d.1229)	18

Duncan (II), earl of Fife, had very strong co-witnessing ‘relationships’ with Gilbert, earl of Strathearn, Hugh of Roxburgh, the king’s clerk and chancellor, William Hay, lord of Errol, the justice William Lindsay, and Bishop Matthew of Aberdeen. Abbot Archibald of Dunfermline co-witnessed 27 times with Hugh of Roxburgh, but did not witness frequently with any laymen. Seven of the top ten pairs include Hugh of Roxburgh.

Table 5.129 shows the number of triangles had by the top 15 actors according to degree. Again, we see a rough correlation between higher number of contacts and higher number of triangles. The trendline allows for examination of individuals who had more or fewer triangles relative to their degree. Philip de Valognes and William Lindsay appear to be on the trendline, while Richard de Prebenda and Hugh of Roxburgh are below the trendline. Earl Duncan, Abbot Archibald, and William de Moreville outperform the trendline.

Figure 5.129. Top 15 by degree, number of triangles

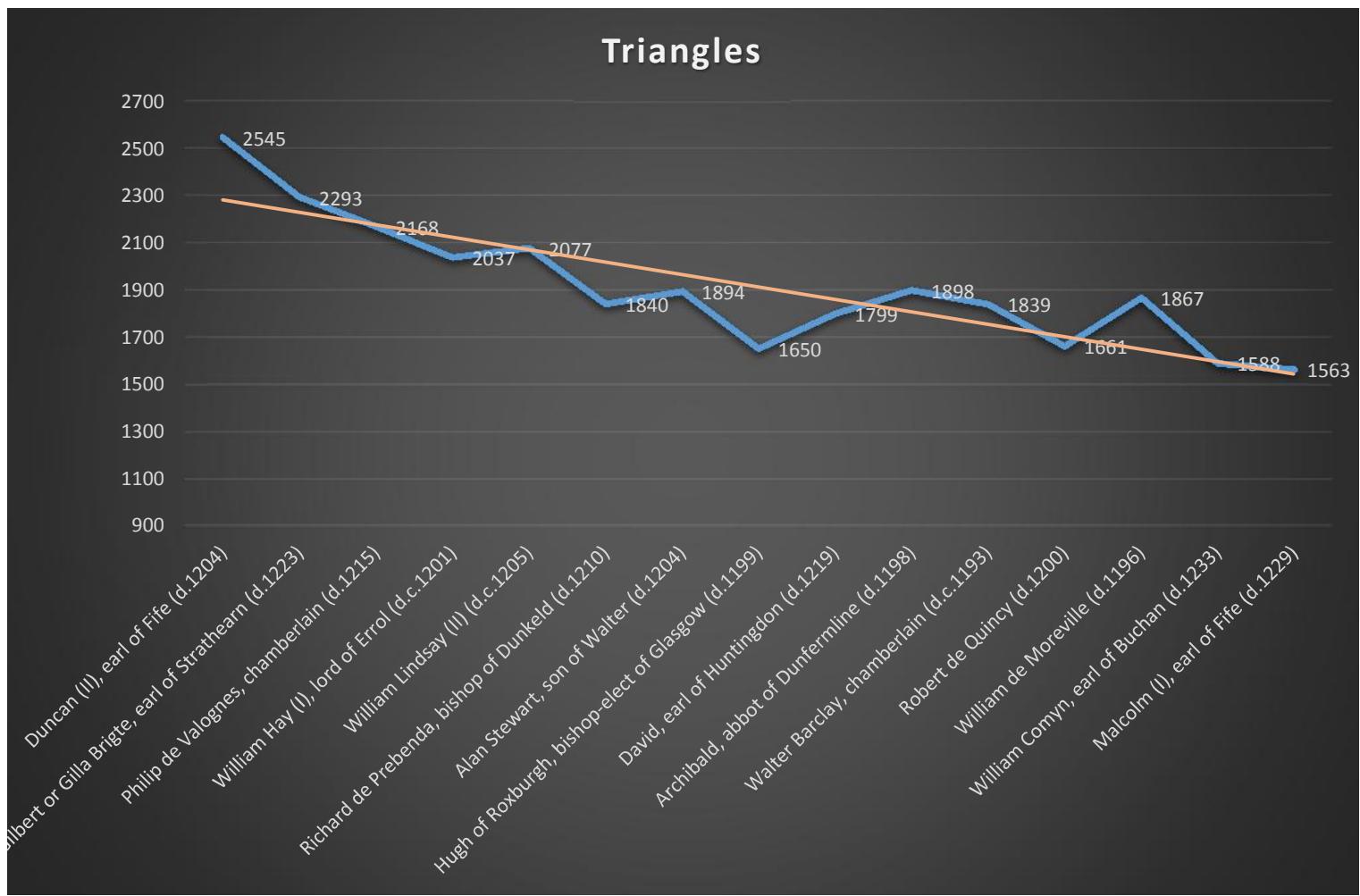


Figure 5.130. Netdraw. William T2, all witnesses

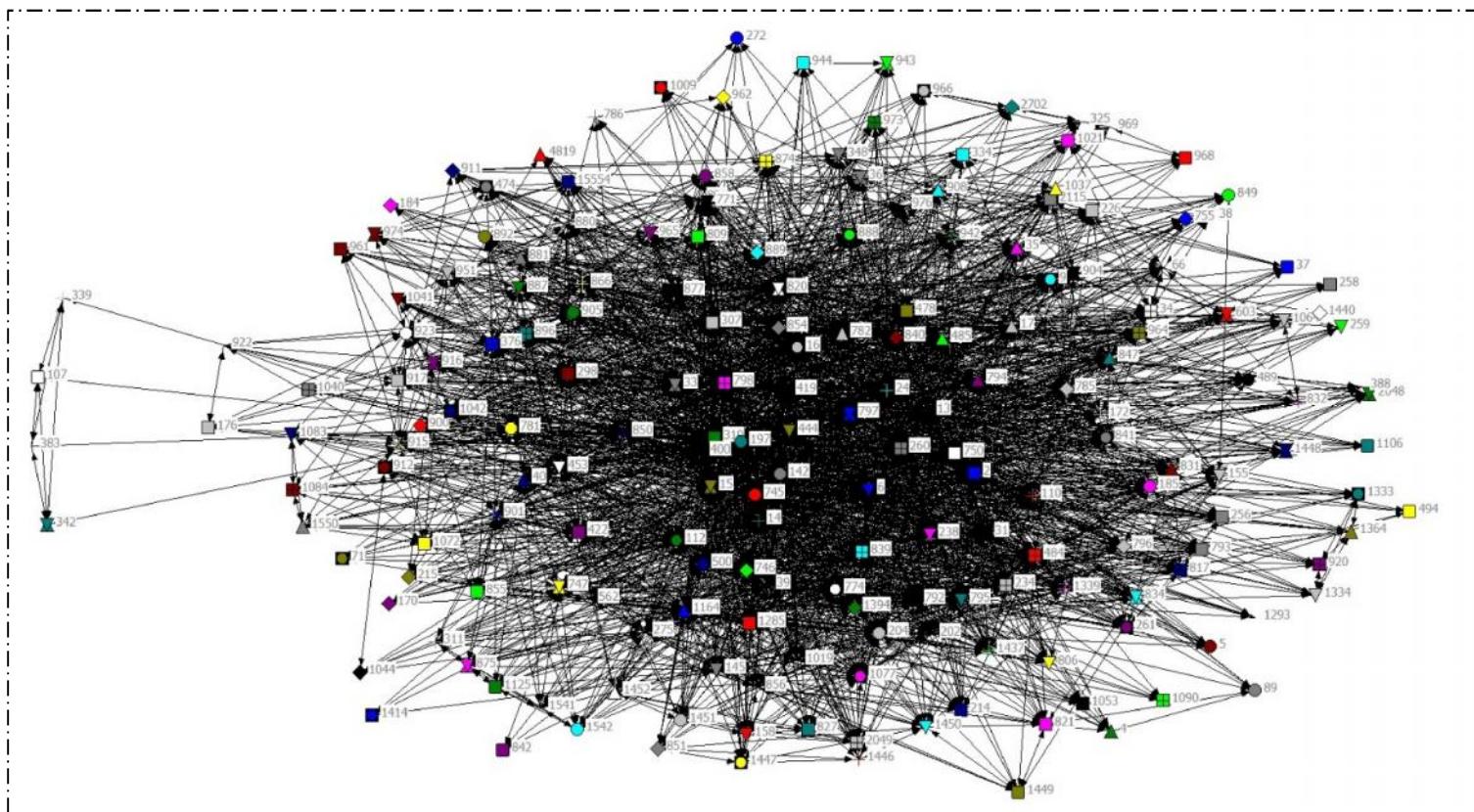


Figure 5.131. Gephi. William T2, all witnesses, close-up



Figure 5.132. Netdraw. William T2, more than 5 co-witnessing acts

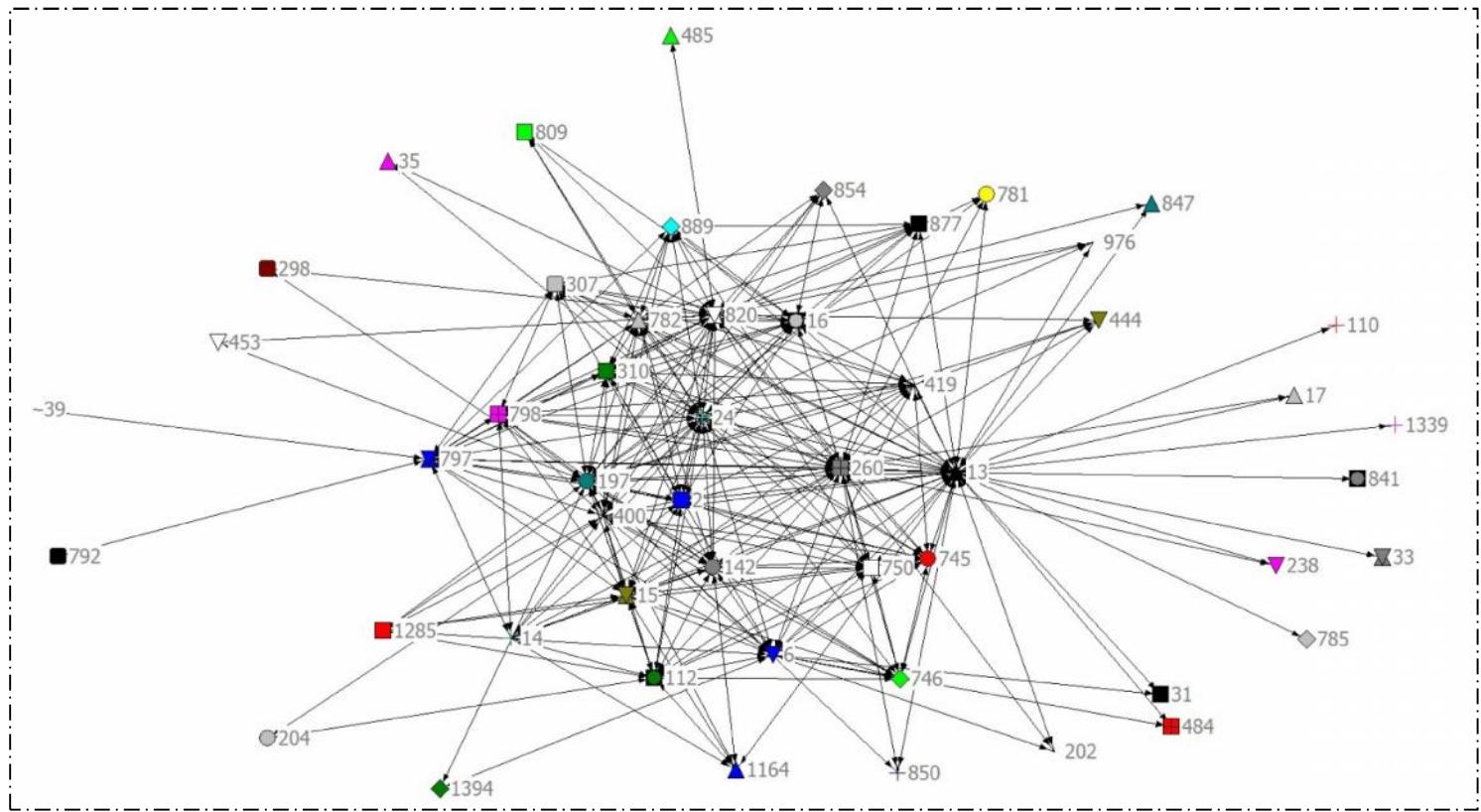


Figure 5.133. Gephi. William T2, more than 5 co-witnessing acts

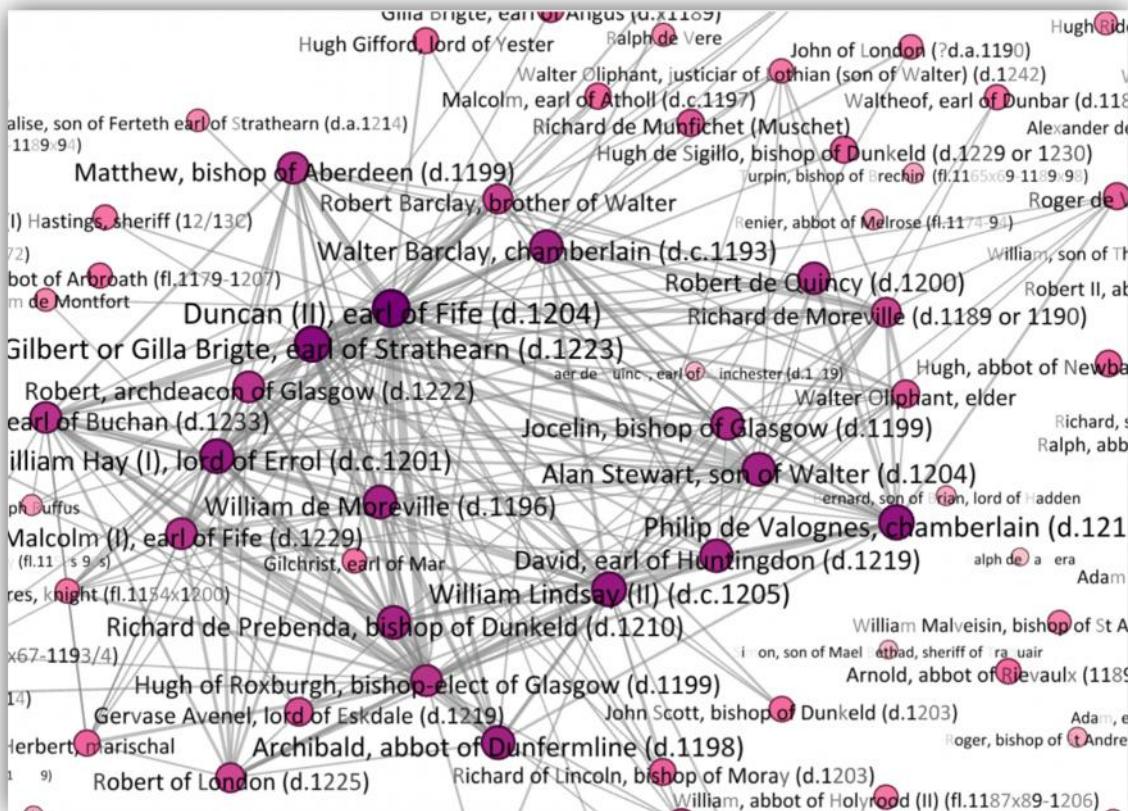


Figure 5.134. Gephi. William T2, Earl Duncan (II) of Fife connections at >5 level

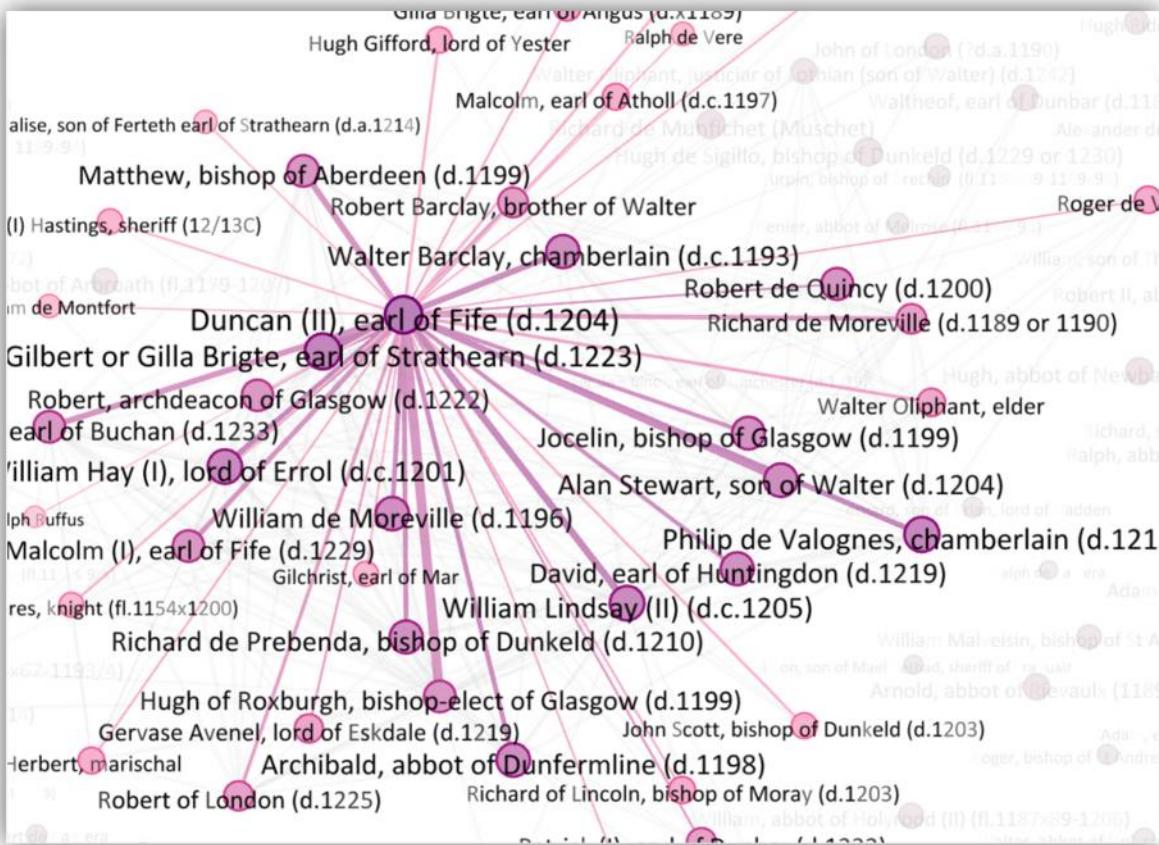


Figure 5.135. Netdraw. William T2, more than 10 co-witnessing acts

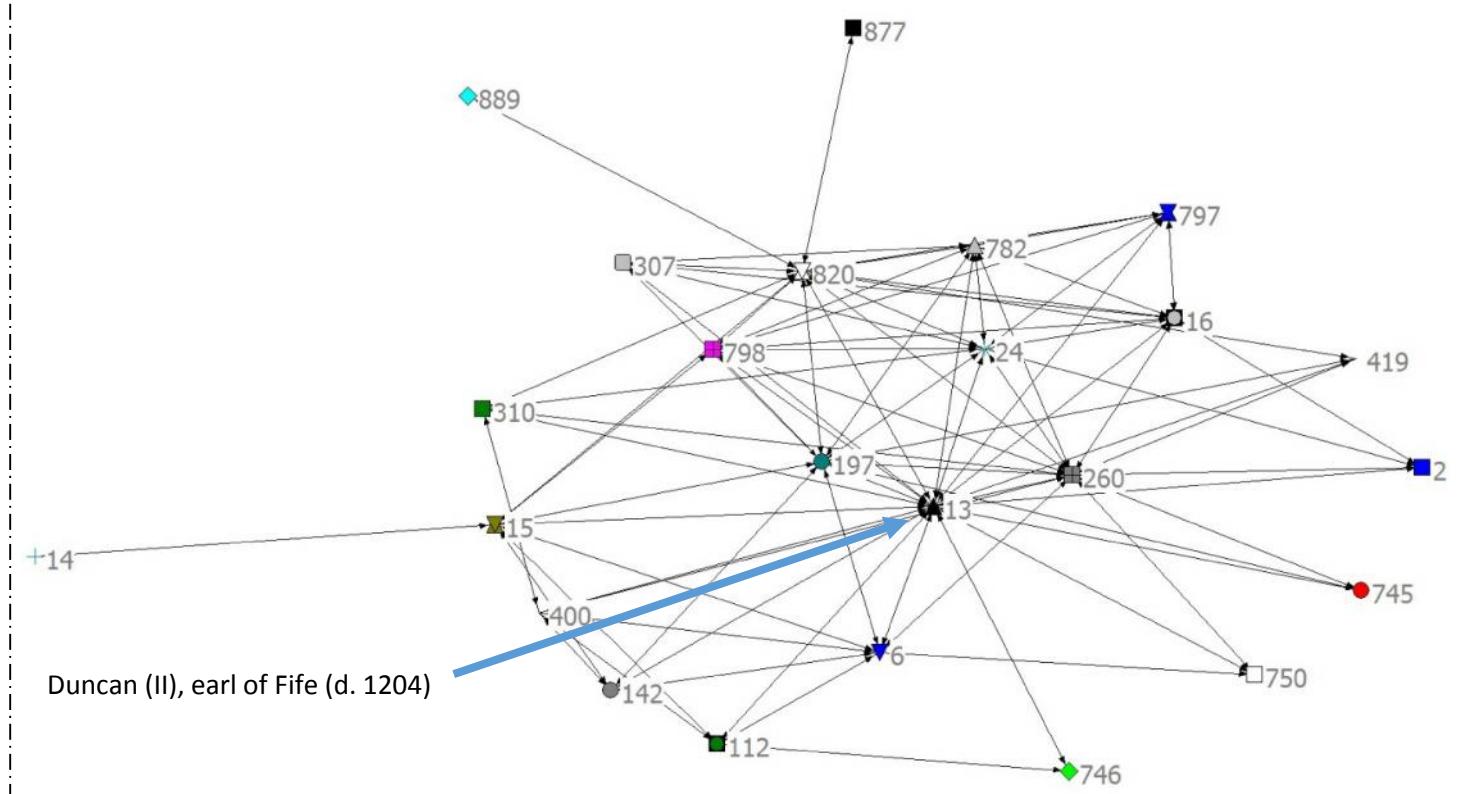


Figure 5.136. Gephi. William T2, more than 10 co-witnessing acts

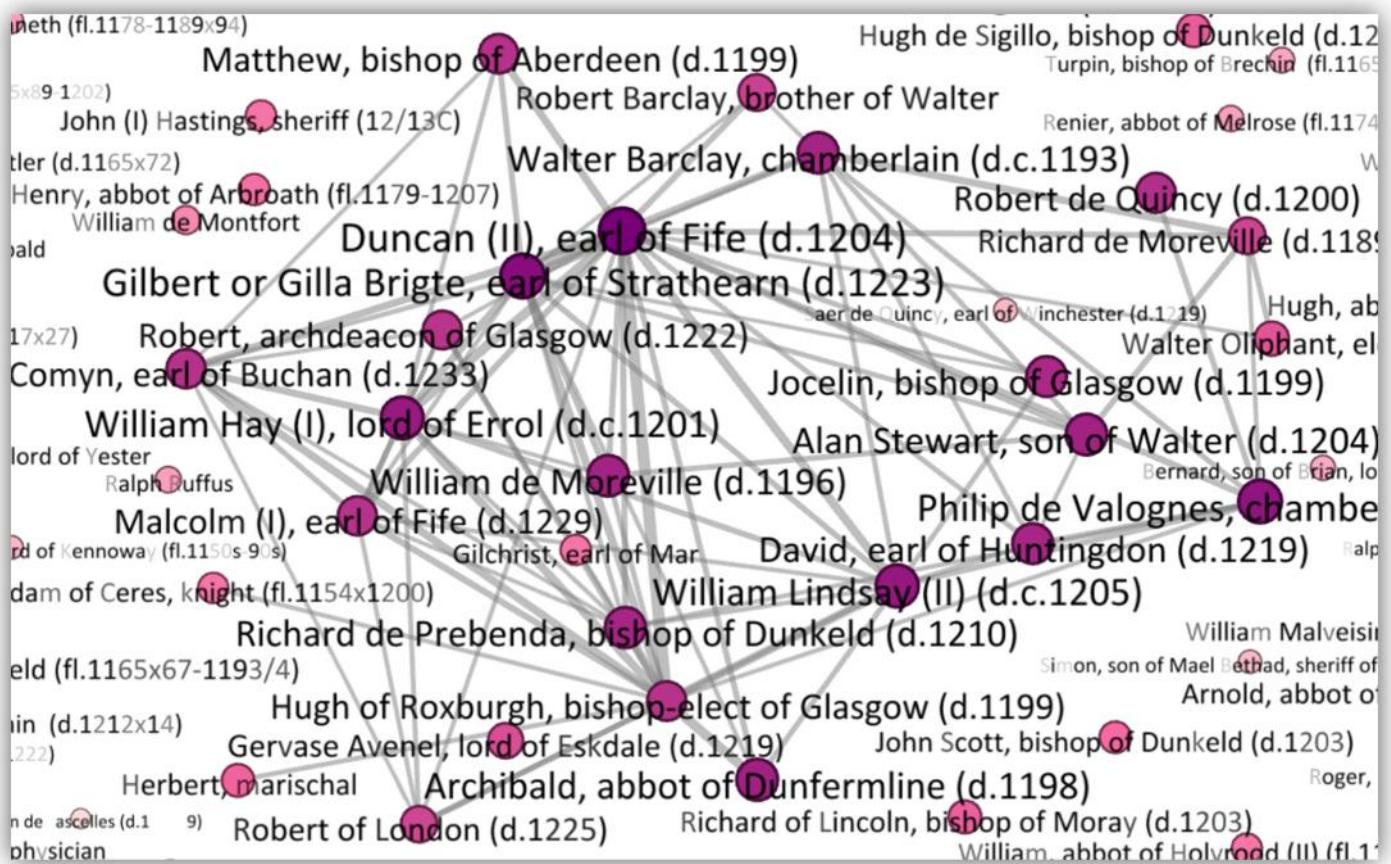


Figure 5.137. Netdraw. William T2, more than 15 co-witnessing acts

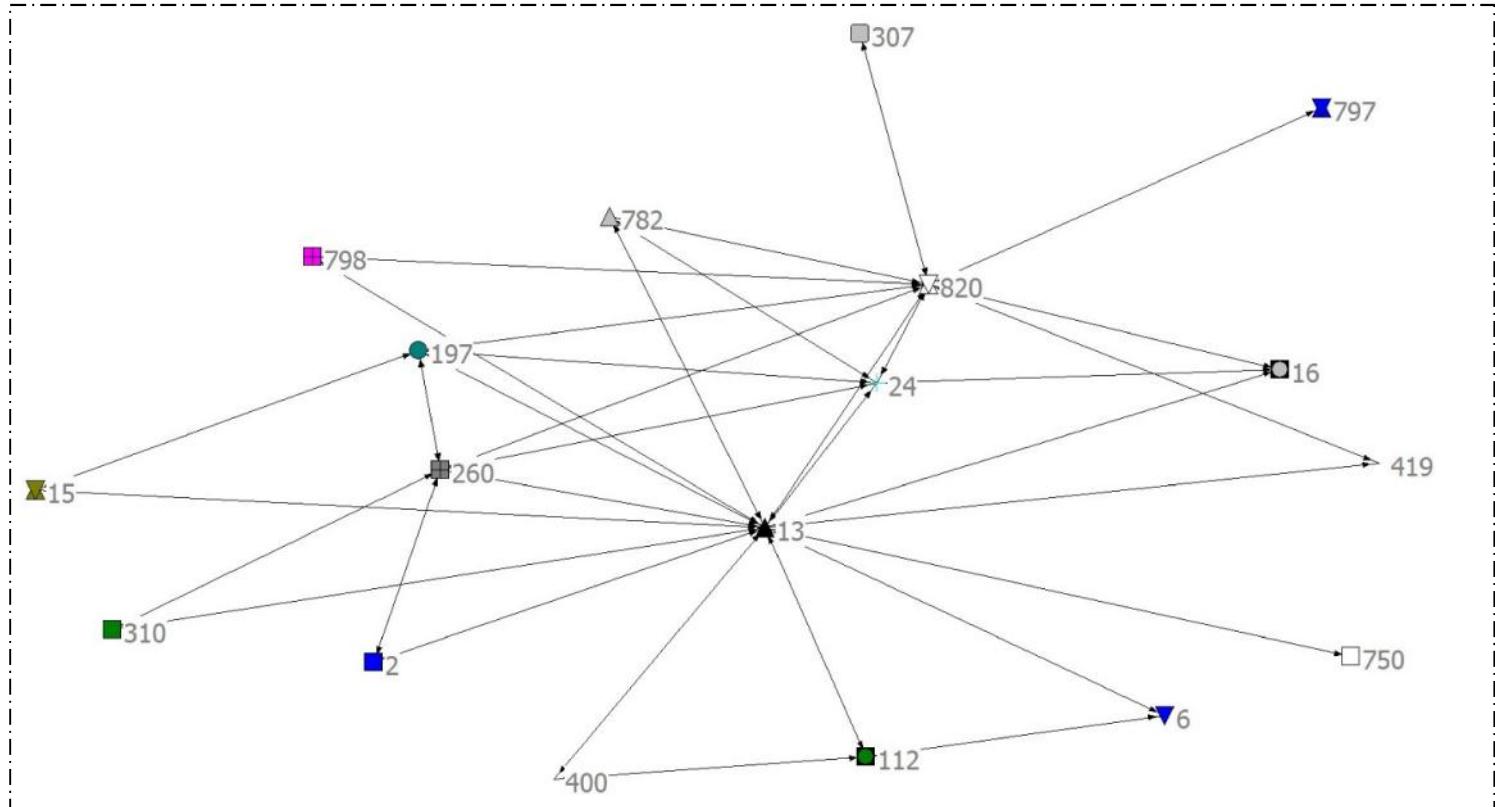


Figure 5.138. Netdraw. William T2, more than 20 co-witnessing acts

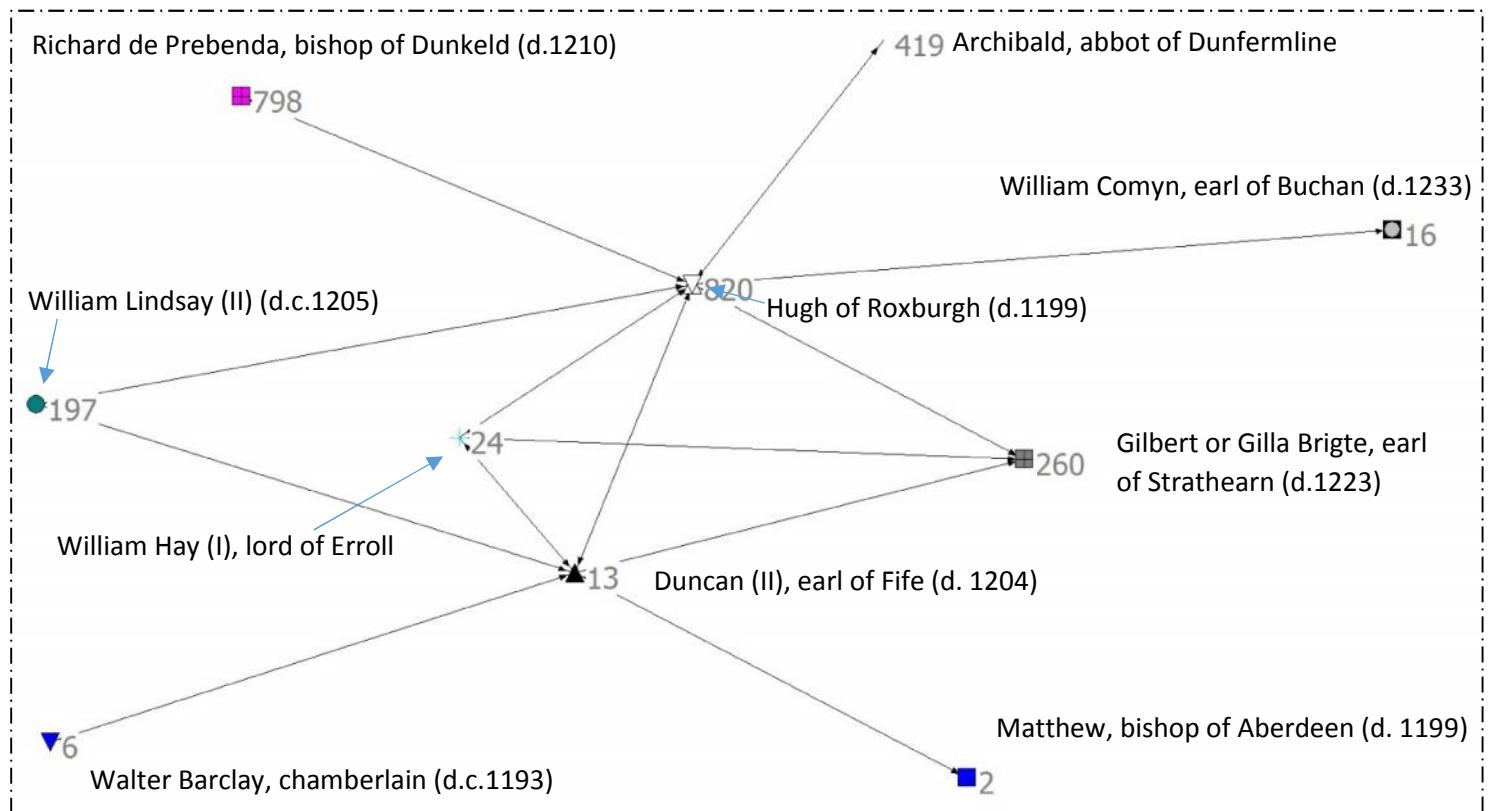


Figure 5.139. Netdraw. William T2, more than 20 co-witnessing acts, edges labelled

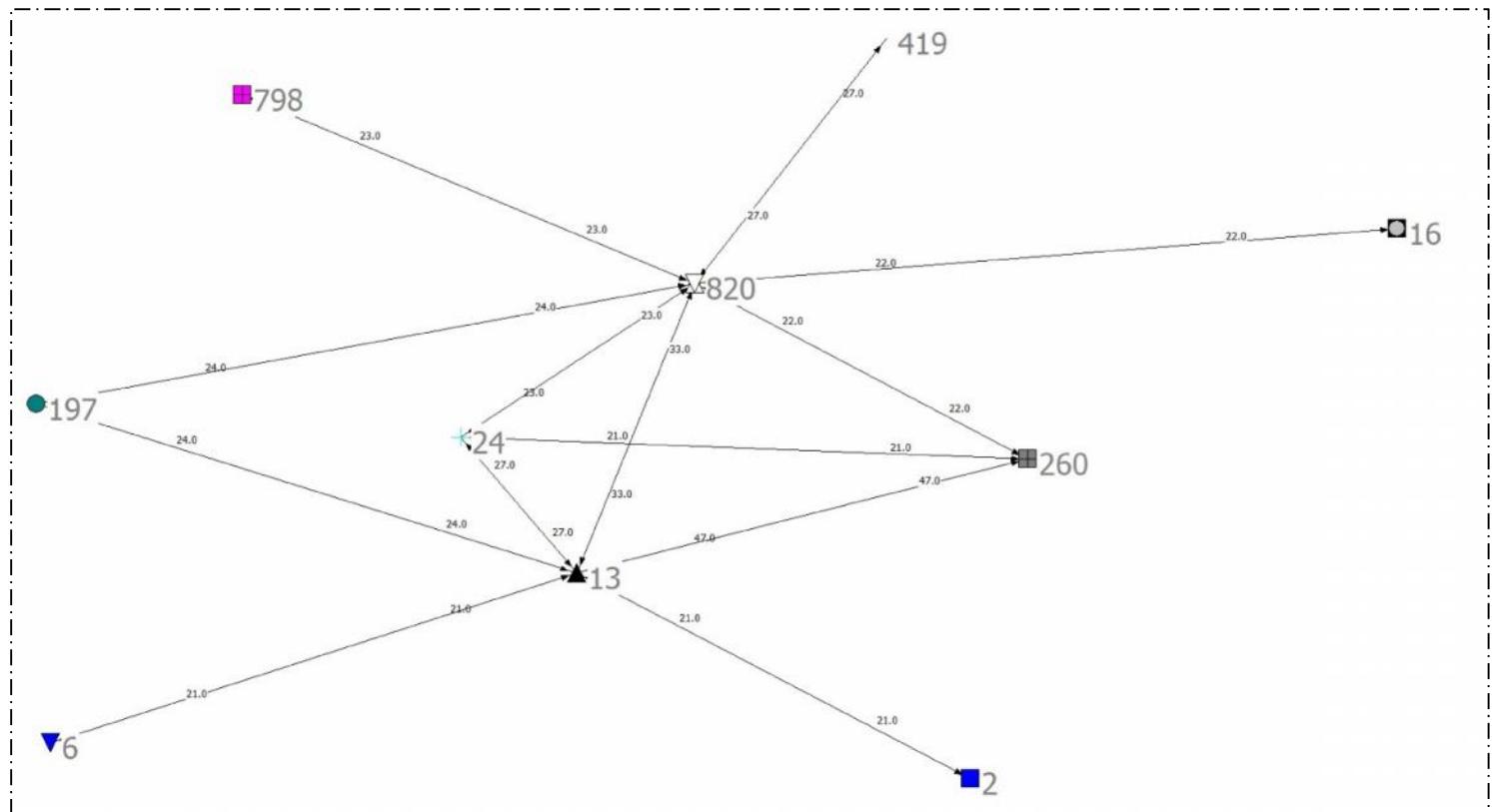


Figure 5.140. Gephi. William T2, more than 20 co-witnessing acts

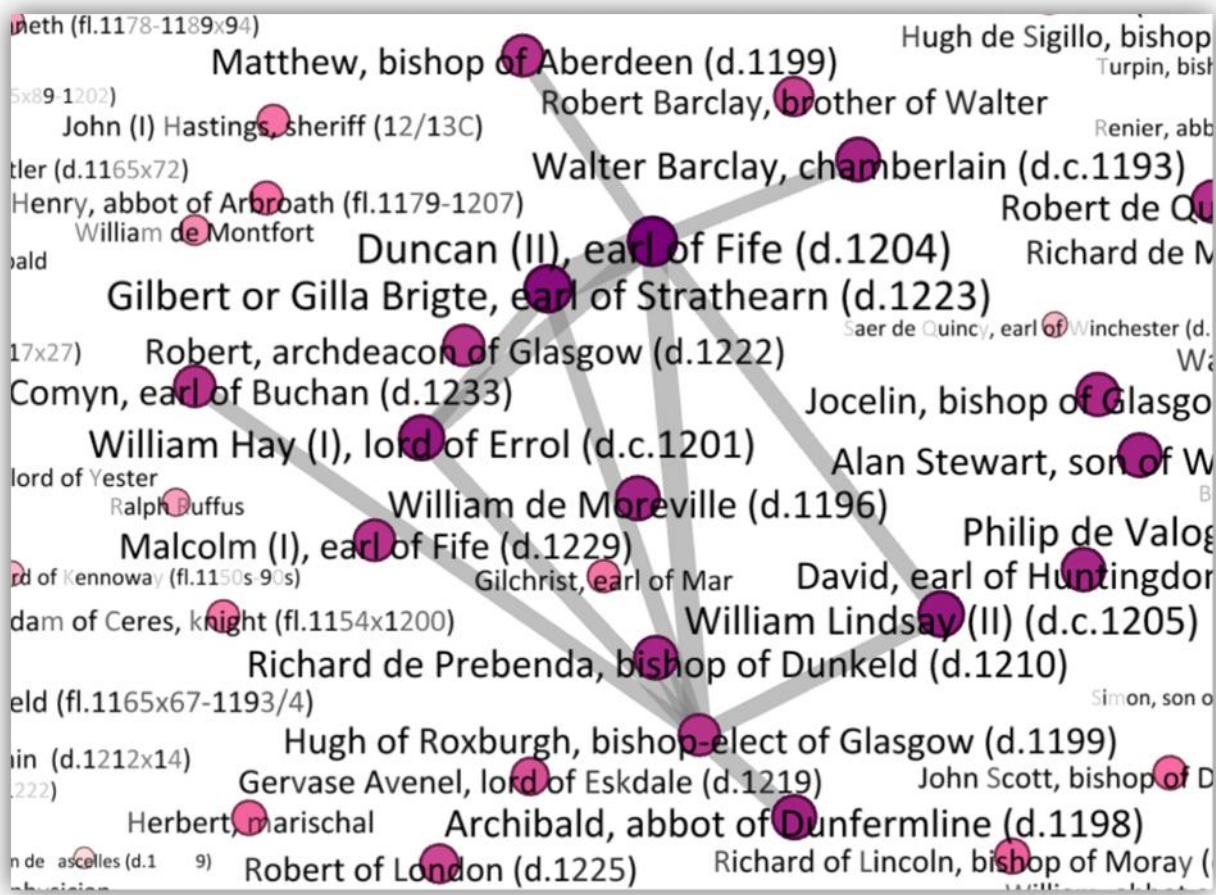


Figure 5.141. Gephi. Earl Duncan (II) connections, more than 20 co-witnessing acts

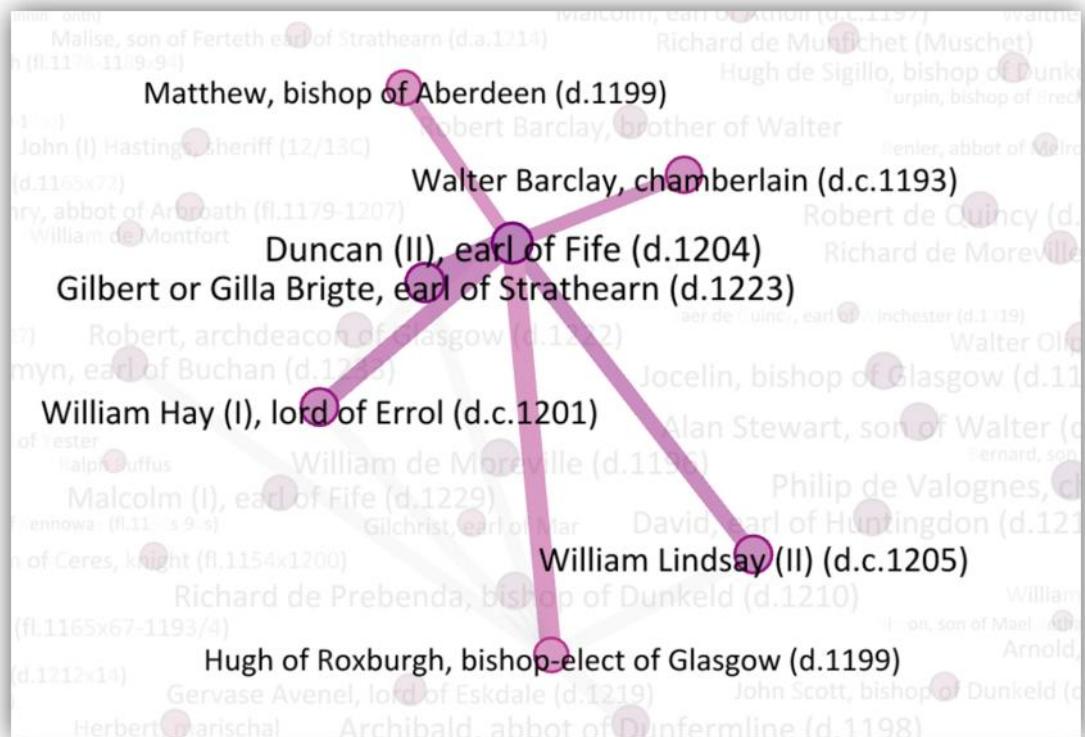


Figure 5.142. Netdraw. William T2, more than 25 co-witnessing acts, edges labelled

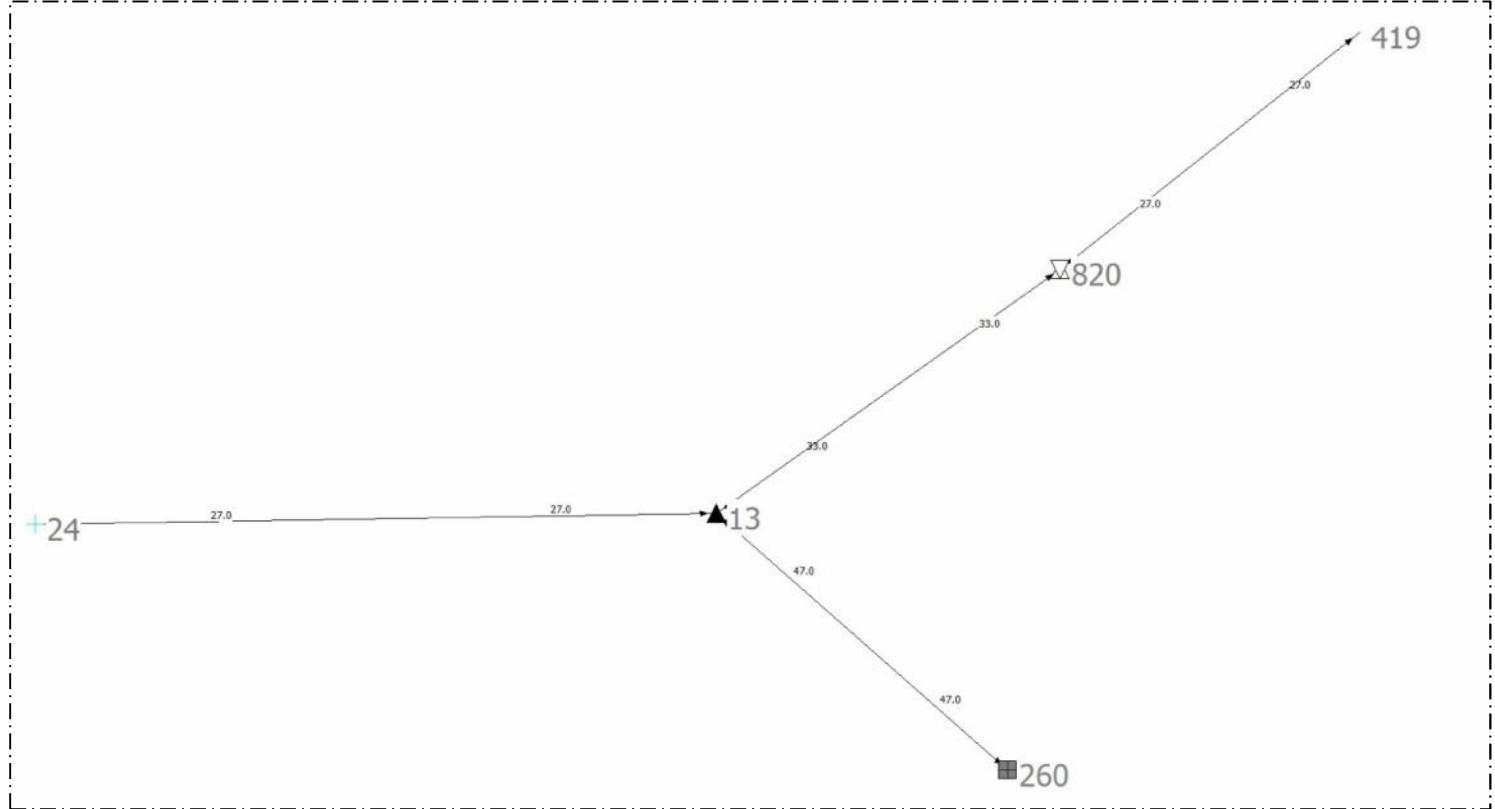
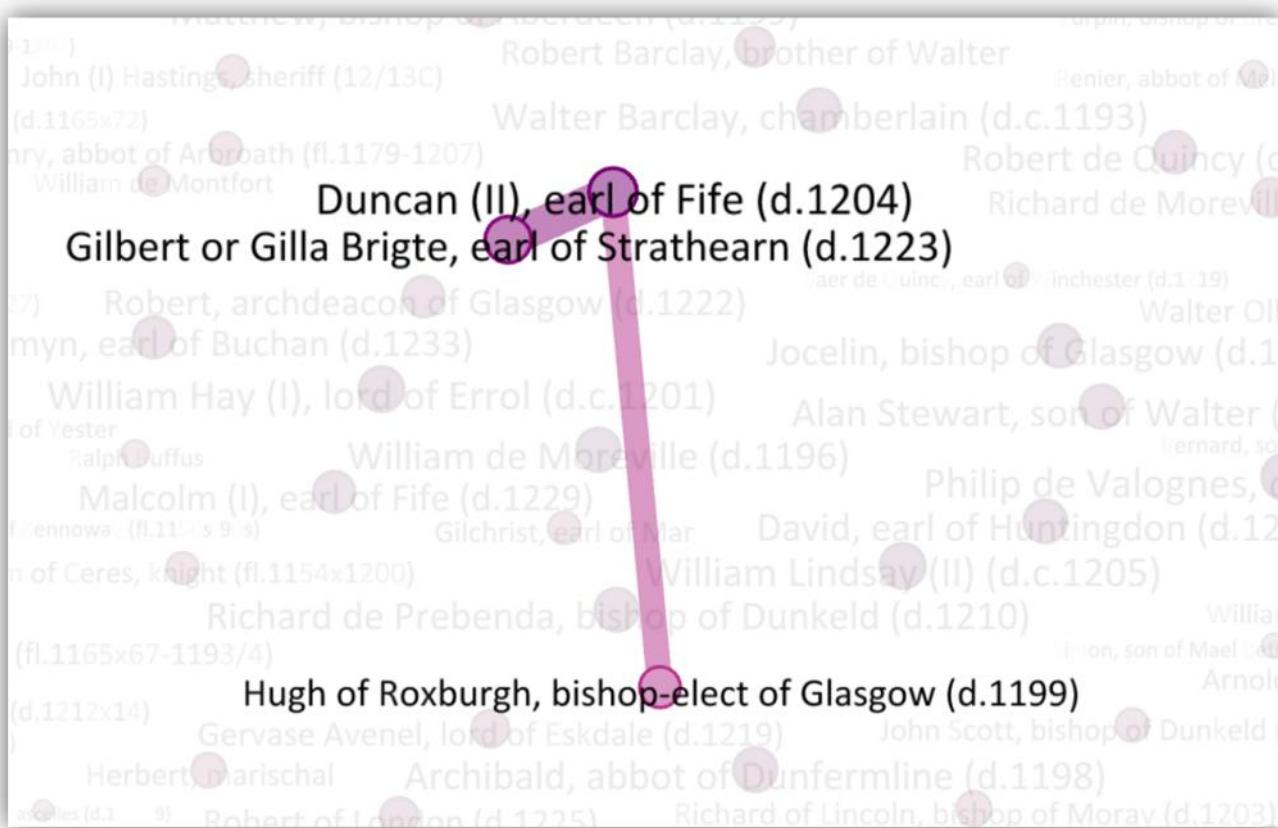


Figure 5.143. Gephi. William T2, more than 30 co-witnessing acts



## WILLIAM I, TIME SLICE 3 (1195-1214)

There are 134 documents in the 19-year time slice between the adoption of the date of time in royal acta in 1195 and William's death in 1214. There were 124 charters, 7 charter/briefs, two notifications and one settlement, out of a potential 149 documents. In other words, 15 SD documents from the period did not have witnesses. Of the 134 documents, 127 were definitely in the period and 7 were possibly in the period. There are 184 witnesses in the study, all men, with 2442 edges.

Table 5.46. Top 15 actors by degree (churchmen in italics)

PoMS ID	Name	Degree	Eigenvector	Betweenness
15	Philip de Valognes, chamberlain (d.1215)	132	1	2733.305
16	William Comyn, earl of Buchan (d.1233)	111	0.930442	1175.217
42	<i>William del Bois, chancellor (d.1232)</i>	100	0.683464	1615.848
307	Robert of London (d.1225)	92	0.810686	918.491
858	<i>Walter of St Albans, bishop of Glasgow (d.1232)</i>	82	0.791262	524.2654
916	Alexander, son of William, sheriff of Stirling	82	0.805202	452.2907
36	Philip of Lundin (13C)	77	0.792537	244.1939
167	<i>William, chaplain (II) of King William (c.1196-1214)</i>	77	0.743797	425.8101
17	John (I) Hastings, sheriff (12/13C)	75	0.737582	303.2948
444	Patrick (I), earl of Dunbar (d.1232)	75	0.740673	343.9586
13	Duncan (II), earl of Fife (d.1204)	74	0.685401	365.3307
887	Richard, son of Hugh de Camera	73	0.743365	424.1545
9	William Gifford, son of Hugh Gifford, lord of Yester	72	0.7175	287.6169
24	William Hay (I), lord of Errol (d.c.1201)	71	0.690863	264.1027
1106	Philip de Mowbray	71	0.701028	324.828

Table 5.47. Top 15 actors by eigenvector (churchmen in italics)

PoMS ID	Name	Degree	Eigenvector
15	Philip de Valognes, chamberlain (d.1215)	132	1
16	William Comyn, earl of Buchan (d.1233)	111	0.930442
307	Robert of London (d.1225)	92	0.810686
916	Alexander, son of William, sheriff of Stirling	82	0.805202
36	Philip of Lundin (13C)	77	0.792537
858	<i>Walter of St Albans, bishop of Glasgow (d.1232)</i>	82	0.791262
167	<i>William, chaplain (II) of King William (c.1196-1214)</i>	77	0.743797
887	Richard, son of Hugh de Camera	73	0.743365
444	Patrick (I), earl of Dunbar (d.1232)	75	0.740673

17	John (I) Hastings, sheriff (12/13C)	75	0.737582
9	William Gifford, son of Hugh Gifford, lord of Yester	72	0.7175
37	Walter Murdoch	69	0.712224
14	Robert de Quincy (d.1200)	68	0.709095
1106	Philip de Mowbray	71	0.701028
24	William Hay (I), lord of Errol (d.c.1201)	71	0.690863

The top role of [15] Philip de Valognes (d. 1215), who retook the chamberlainship from around 1193 until his death in 1215, provides a measure of continuity with the previous period. A number of the top actors from the last quarter of the twelfth century died between about 1199 and 1204, and their successors appear not to have been as central to the administration of the kingdom, at least as far as witnessing royal documents indicates. With the death of Abbot Archibald of Dunfermline, the chief religious advisor appears to have been the king's chaplain, [167] William. The king's clerk and chancellor, [42] William del Bois, and [858] Walter of St Albans, another royal chaplain who was raised to the see of Glasgow in 1207, are the only other clerics among the most central witnesses. While William did not become chancellor until 1210 or 1211, he had been running the king's chapel during the chancellorship of the king's relative Florence, bishop-elect of Glasgow. While William del Bois had a large group of 100 'contacts' (degree), and an important betweenness centrality, the eigenvector calculations reveal that most of his co-witnesses were minor figures. He comes in at the number 17 position with an eigenvector of 68% that of Philip de Valognes. Being a household officer seems to have mattered less than ever, with no steward, constable, butler or other honorific appearing in the top 15 by either degree or eigenvector. [16] William Comyn, earl of Buchan, who took over as sole royal justice in 1205, is the real partner to Philip de Valognes at the top of the pile. A glance at the sociogram of co-witnessing acts more than 5 times (Figure 5.146) shows Valognes and Comyn together at the centre of the graph. The graph of triangles (Figure 5.144) shows Valognes and Comyn both well above the trendline, and William del Bois well below it.

Gilbert or Gilla Brigte, earl of Strathearn, who occupied the number 2 slot in the William T2 period, has fallen to place number 30 by degree as well as eigenvector, despite the fact that he was alive through the whole period. Interestingly, Malcolm, earl of Fife, who figured relatively highly in the William T2 period, has actually fallen in the league tables during this T3 period which saw him take up the earldom in 1204. [782] Malcolm had a degree of 67 and an eigenvector score of 67.6%. Instead, we see sheriffs like Alexander of Stirling and John Hastings at the king's court, as well as barons and knights like Philip de Mowbray, Philip of Lundin, and William Giffard.

Table 5.48. Positions held by top actors (churchmen in italics)

Poms Id	Name	Position
15	Philip de Valognes, chamberlain (d.1215)	Chamberlain (ca 1193-1215)
16	William Comyn, earl of Buchan (d.1233)	Justice (ca 1205 – ca 1232)
42	<i>William del Bois, chancellor (d.1232)</i>	Clerk, Chancellor (1210×11-)
307	Robert of London (d.1225)	Son of king
858	<i>Walter of St Albans, bishop of Glasgow (d.1232)</i>	Chaplain (until 1207)
916	Alexander, son of William, sheriff of Stirling	Sheriff
36	Philip of Lundin (13C)	Knight/baron
167	<i>William, chaplain (II) of King William (c.1196-1214)</i>	Chaplain
17	John (I) Hastings, sheriff (12/13C)	Knight/baron/sheriff
444	Patrick (I), earl of Dunbar (d.1232)	Justice (until 1205)
13	Duncan (II), earl of Fife (d.1204)	Justice (until 1204)
887	Richard, son of Hugh de Camera	Chamber?
9	William Gifford, son of Hugh Gifford, lord of Yester	Knight/ baron
24	William Hay (I), lord of Errol (d.c.1201)	Knight/baron
1106	Philip de Mowbray	Knight/baron

Table 5.49. Documents witnessed by top actors (churchmen in italics)

ID	Person	#WT3 docs witnessed	% WT3 docs witnessed	Docs/ year (19 years)	Degree/ docs witnessed
15	Philip de Valognes, chamberlain (d.1215)	71	53%	3.74	1.86
16	William Comyn, earl of Buchan (d.1233)	63	47%	3.32	1.76
42	<i>William del Bois, chancellor (d.1232)</i>	50	37%	2.63	2
307	Robert of London (d.1225)	35	26%	1.84	2.63
858	<i>Walter of St Albans, bishop of Glasgow (d.1232)</i>	25	19%	1.32	3.28
916	Alexander, son of William, sheriff of Stirling	22	16%	1.16	3.73
167	<i>William, chaplain (II) of King William (c.1196-1214)</i>	27	20%	1.42	2.85
1106	Philip de Mowbray	21	16%	1.11	3.38
782	Malcolm (I), earl of Fife (d. 1229)	16	12%	0.84	4.19
13	Duncan (II), earl of Fife (d. 1204)	19	14%	1	3.89

Philip de Valognes witnessed more than half of all the royal documents in this period, and William Comyn witnessed 47%. These two witnessed over three documents a year on average, significantly more than even the king's clerks and chaplains. In stark contrast to his father's previous track record, Earl Malcolm of Fife witnessed less than one royal document per year. William Comyn had the lowest quotient of degree divided by documents witnessed. Looking at Table 5.50, it is remarkable that Richard Revel witnessed 24 documents but had a degree of only 55.

Table 5.50. Numbers of documents (SD) witnessed (16 or more)

PoMS ID	Name	Docs witnessed
15	Philip de Valognes, chamberlain (d.1215)	71
42	William del Bois, chancellor (d.1232)	63
16	William Comyn, earl of Buchan (d.1233)	50
307	Robert of London (d.1225)	32
24	William Hay (I), lord of Errol (d.c.1201)	29
167	William, chaplain (II) of King William (c.1196-1214)	27
858	Walter of St Albans, bishop of Glasgow (d.1232)	25
55	Richard Revel, lord of Coultra (d.1215x25)	24
39	Hugh de Sigillo, bishop of Dunkeld (d.1229 or 1230)	24
887	Richard, son of Hugh de Camera	22
916	Alexander, son of William, sheriff of Stirling	22
881	Herbert de Camera	21
1106	Philip de Mowbray	21
14	Robert de Quincy (d.1200)	21
36	Philip of Lundin (13C)	20
820	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	20
13	Duncan (II), earl of Fife (d.1204)	19
17	John (I) Hastings, sheriff (12/13C)	18
1277	Oliver, king's chaplain (fl.c.1208-c.1214)	18
9	William Gifford, son of Hugh Gifford, lord of Yester	17
782	Malcolm (I), earl of Fife (d.1229)	16
798	Richard de Prebenda, bishop of Dunkeld (d.1210)	16

Philip de Valognes, William Comyn, and William del Bois all rank highly in the most productive co-witnessing pairs. Philip occupies three of the top five, and eight of the top 19 slots. William del Bois was involved in three of the top five and 9 of the top 19 slots, while William Comyn was part of 2 of the most productive pairs. It is noteworthy that William Hay managed to witness 29 documents in total, including 21 alongside Philip de Valognes, when he died only six years into the period.

Table 5.51. Pairs who witnessed together 13 or more times

Person 1	Person 2	#docs
Philip de Valognes, chamberlain (d.1215)	William Comyn, earl of Buchan (d.1233)	33
Philip de Valognes, chamberlain (d.1215)	William del Bois, chancellor (d.1232)	27
Hugh de Sigillo, bishop of Dunkeld (d.1229 or 1230)	William del Bois, chancellor (d.1232)	21
Philip de Valognes, chamberlain (d.1215)	William Hay (I), lord of Errol (d.c.1201)	20
William Comyn, earl of Buchan (d.1233)	William del Bois, chancellor (d.1232)	20

William del Bois, chancellor (d.1232)	Richard Revel, lord of Coultra (d.1215x25)	19
William del Bois, chancellor (d.1232)	Oliver, king's chaplain (fl.c.1208-c.1214)	18
William, chaplain (II) of King William (c.1196-1214)	William del Bois, chancellor (d.1232)	17
Herbert de Camera	William del Bois, chancellor (d.1232)	16
Robert de Quincy (d.1200)	William Hay (I), lord of Errol (d.c.1201)	15
Philip de Valognes, chamberlain (d.1215)	Walter of St Albans, bishop of Glasgow (d.1232)	15
Richard, son of Hugh de Camera	William del Bois, chancellor (d.1232)	15
Philip de Valognes, chamberlain (d.1215)	Philip of Lundin (13C)	14
Philip de Valognes, chamberlain (d.1215)	Hugh of Roxburgh, bp-elect of Glasgow (d.1199)	14
Philip de Valognes, chamberlain (d.1215)	Robert of London (d.1225)	14
William Hay (I), lord of Errol (d.c.1201)	Hugh of Roxburgh, bp-elect of Glasgow (d.1199)	14
Walter of St Albans, bishop of Glasgow (d.1232)	William del Bois, chancellor (d.1232)	14
Duncan (II), earl of Fife (d.1204)	William Hay (I), lord of Errol (d.c.1201)	13
Philip de Valognes, chamberlain (d.1215)	William, chaplain (II) of K. William (c.1196-1214)	13

Figure 5.144. Top 15 by degree, number of triangles

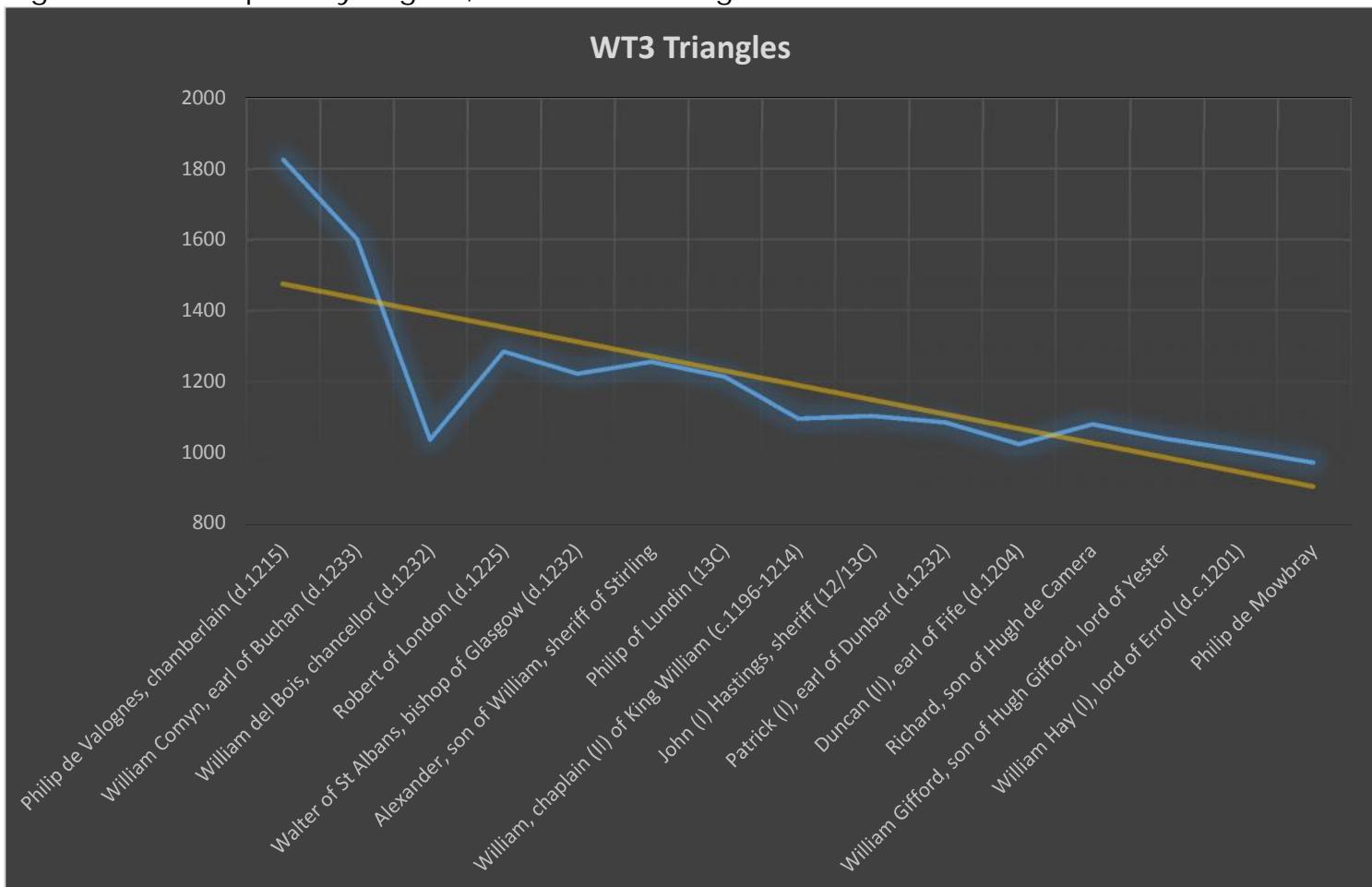


Figure 5.144A. Top 15 by eigenvector, number of triangles

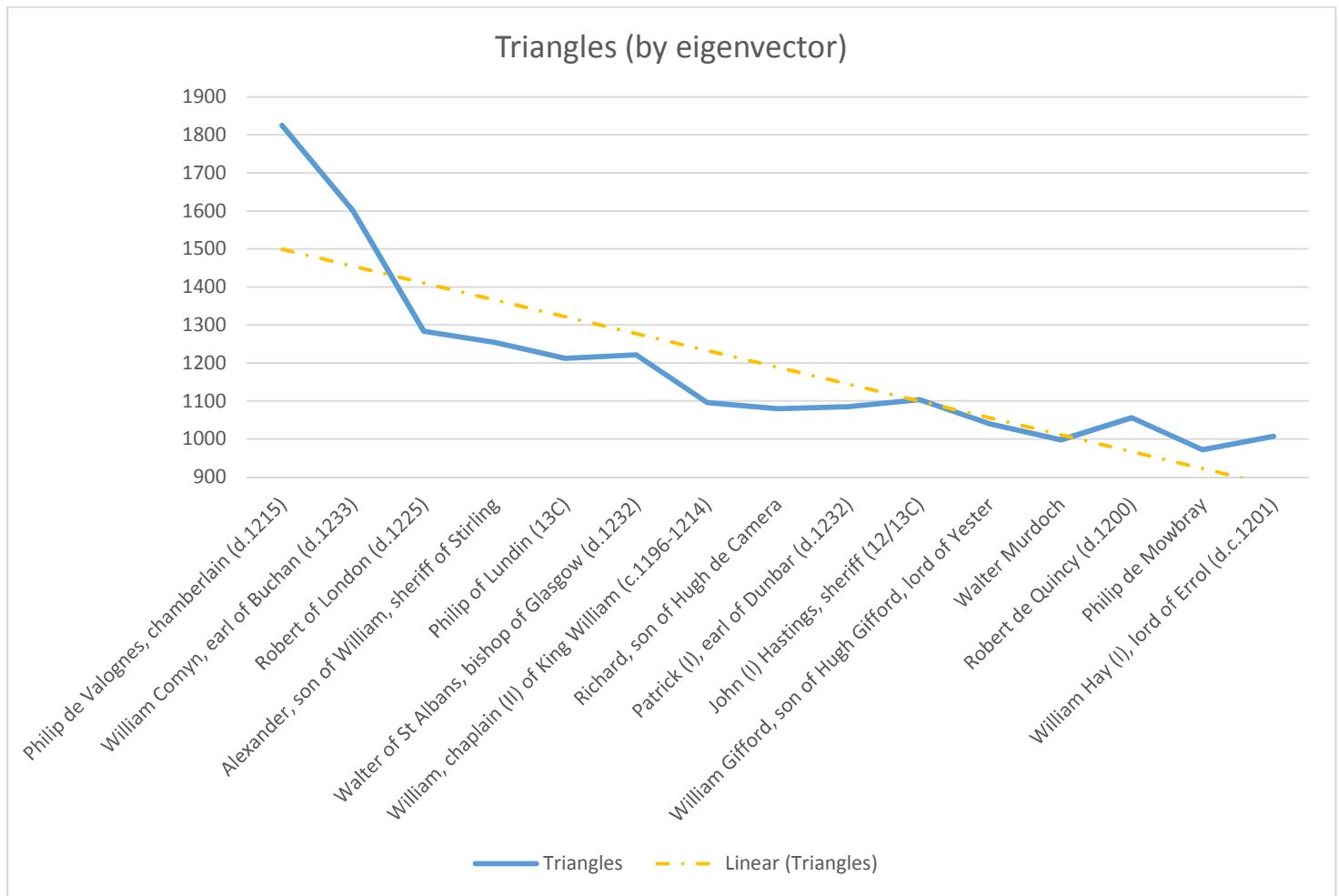


Figure 5.145. Netdraw. William T3, all witnesses

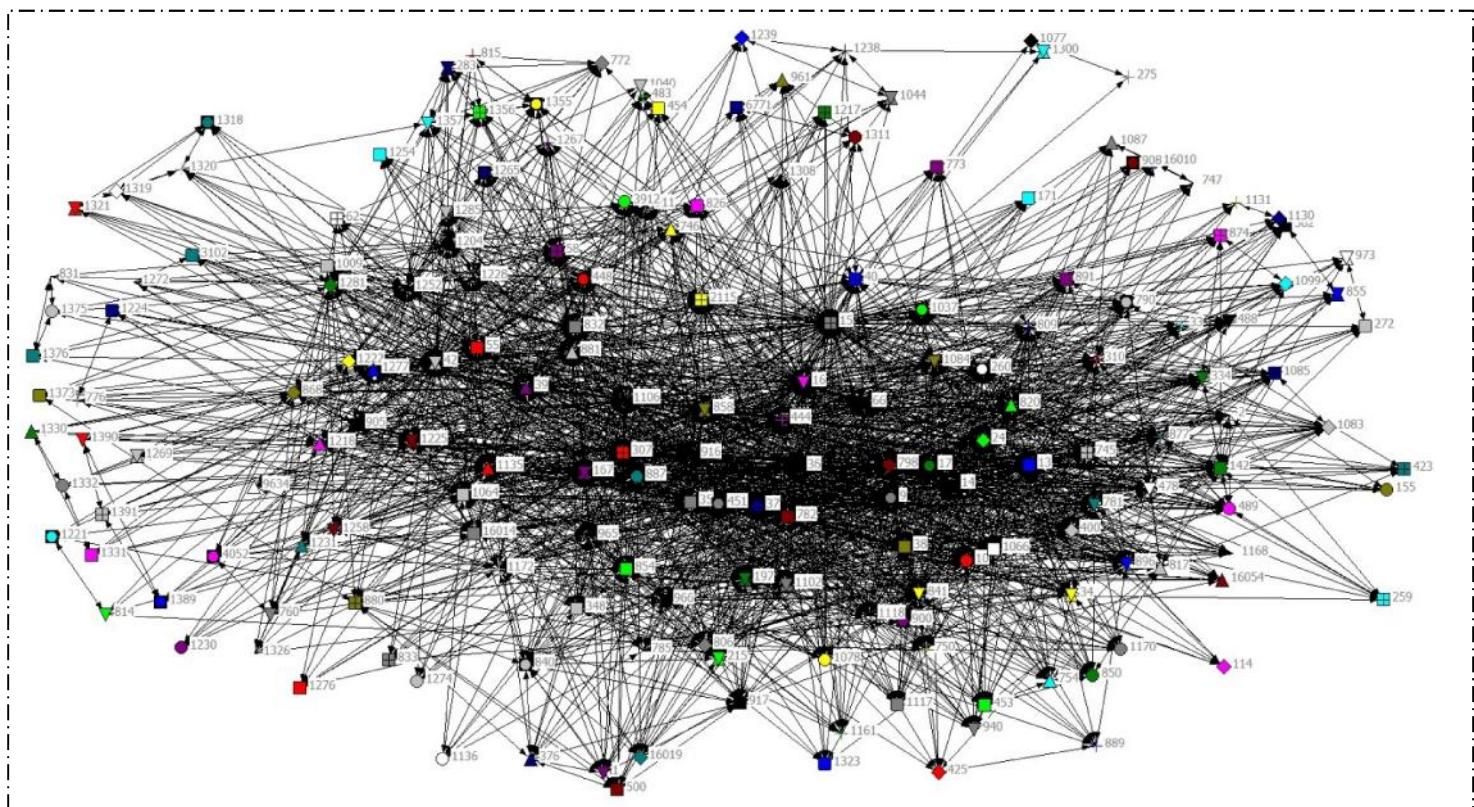


Figure 5.146. Netdraw. William T3, more than 5 witnesses

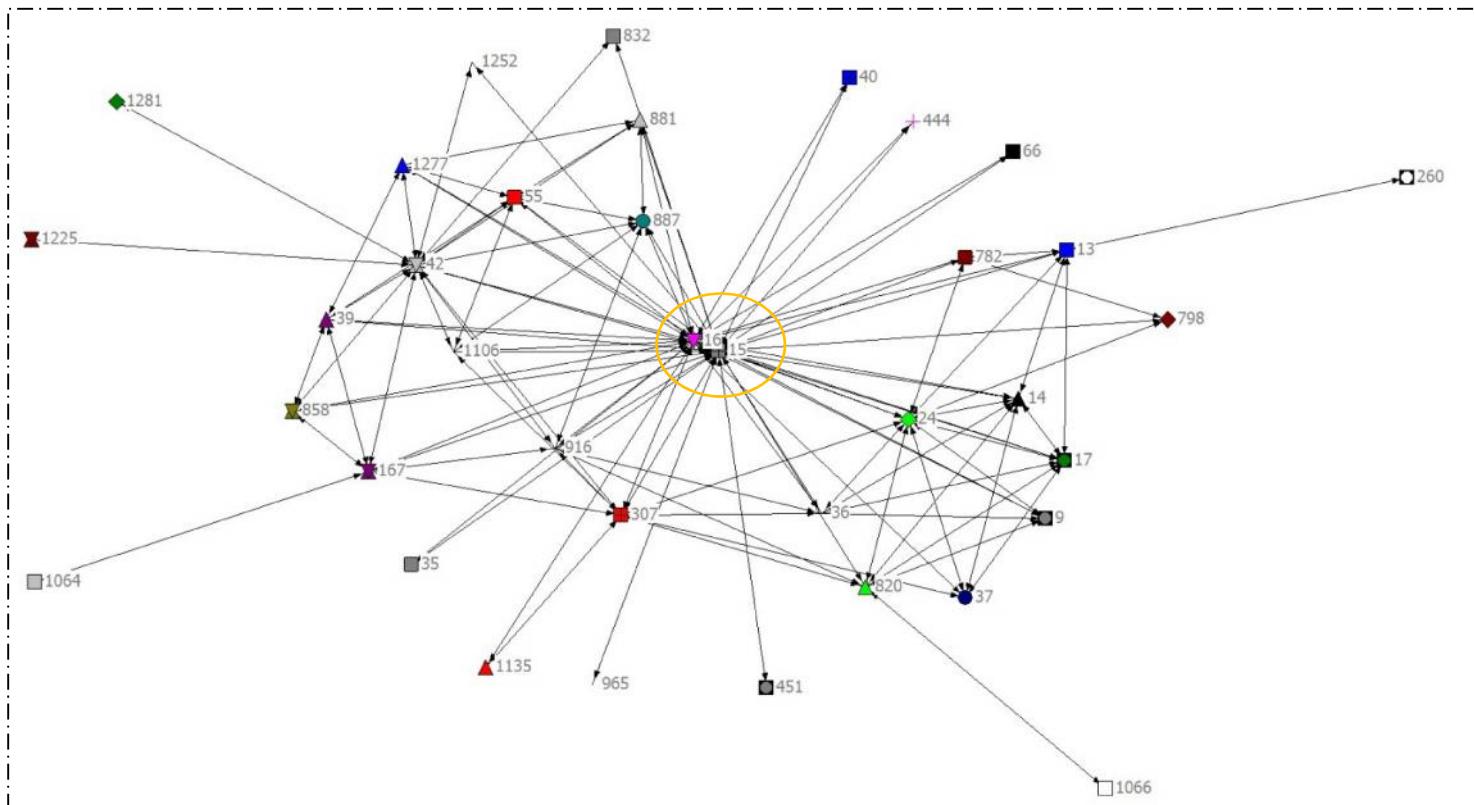


Figure 5.147 shows the network of individuals who co-witness more than 10 times. The central roles of [15] Philip de Valognes and [16] William Comyn are clear. The earlier generation appears on the right, and the death dates of some individuals are shown. [14] Robert de Quincy died in 1200, [24] William Hay died about a year later, and [13] Earl Duncan died in 1204. [820] Hugh of Roxburgh died in 1199. This sociogram represents a kind of handing off the baton to the next generation, especially [16] William Comyn (d. 1233), [42] William del Bois (d. 1232), [39] Hugh de Sigillo (d. 1229/30), and the king's son [307] Robert of London (d. 1225).

Figure 5.147. Netdraw. William T3, more than 10 witnesses, with death dates

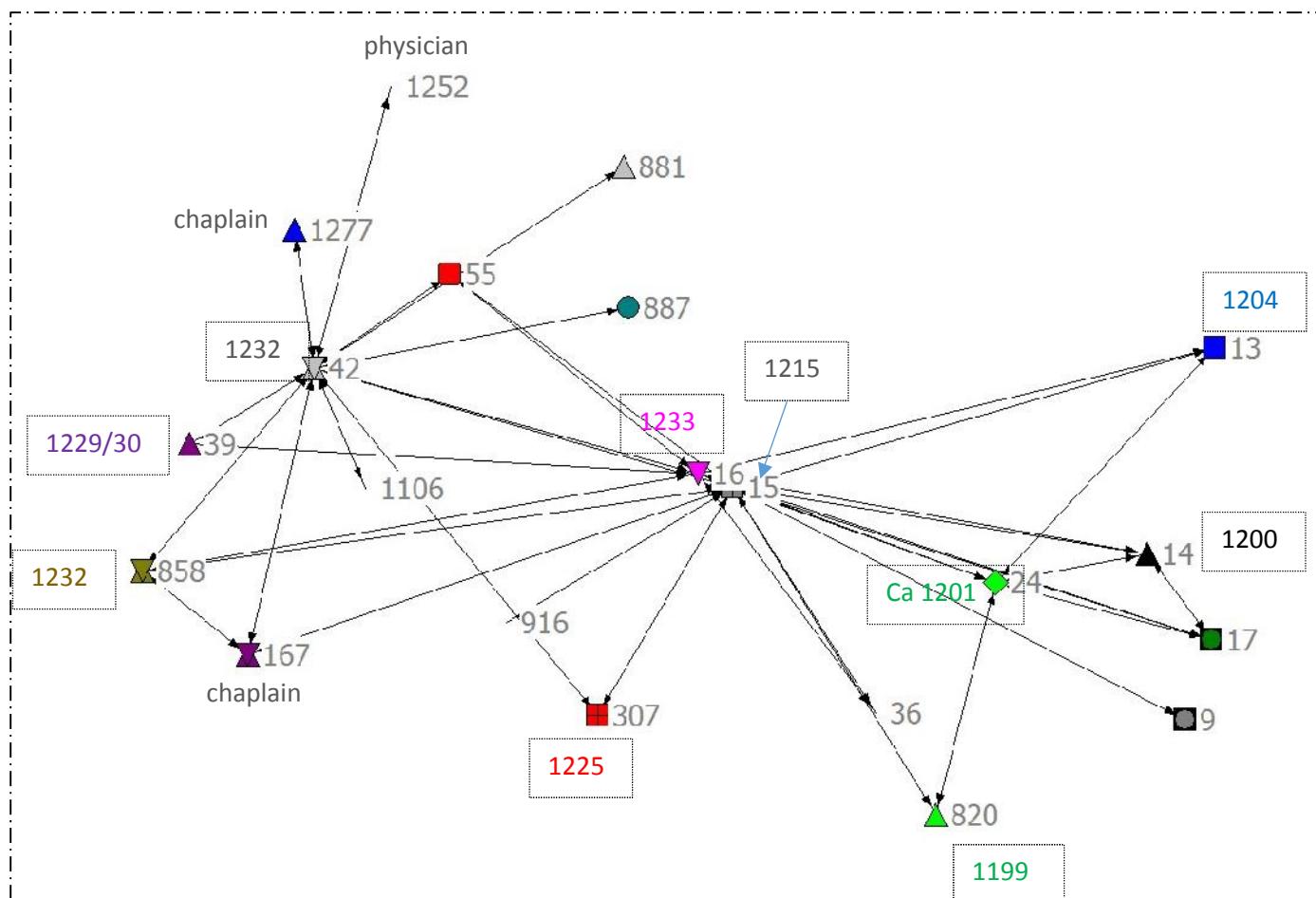


Figure 5.148. Gephi. William T3, more than 10 witnesses

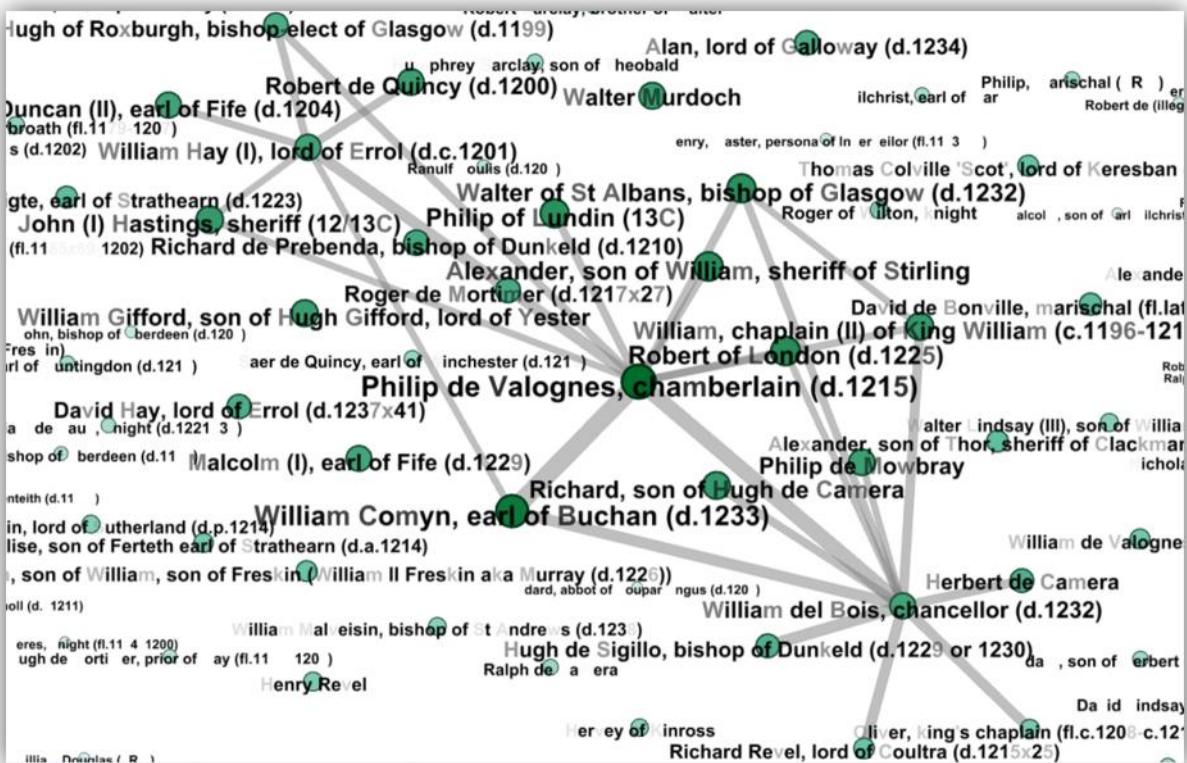


Figure 5.149. Netdraw. William T3, more than 15 witnesses, with edge weights

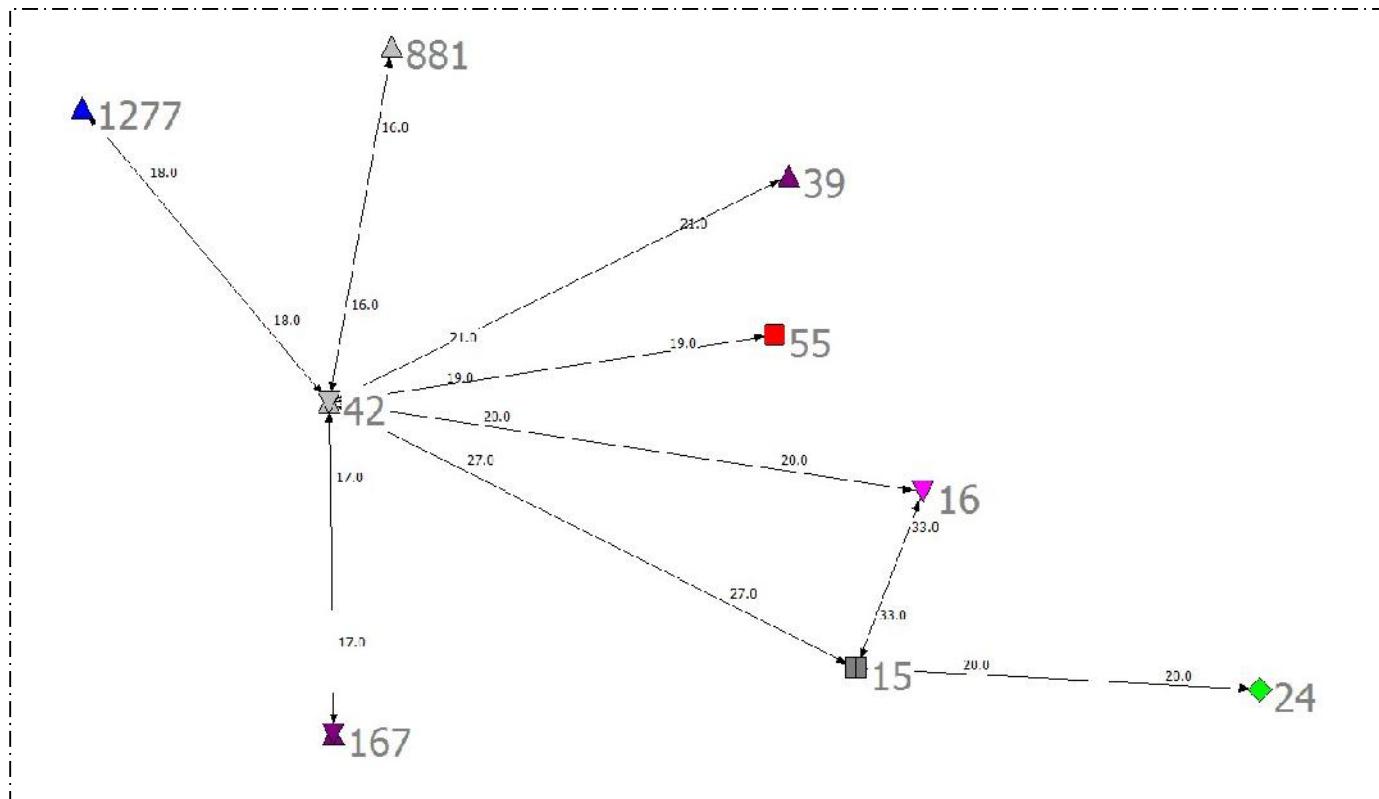


Figure 5.150. Netdraw. William T3, more than 20 witnesses, with edge weights

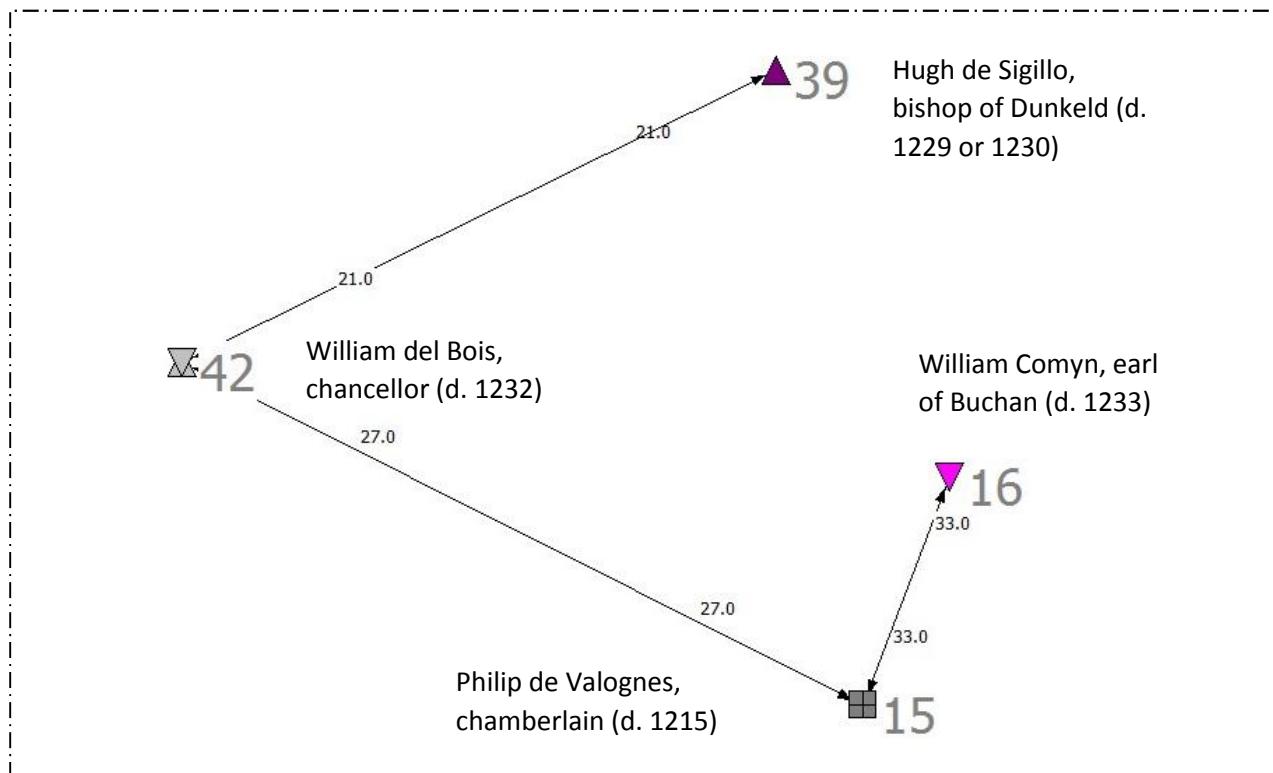


Figure 5.151. Connections of William Comyn, earl of Buchan, > 5 level

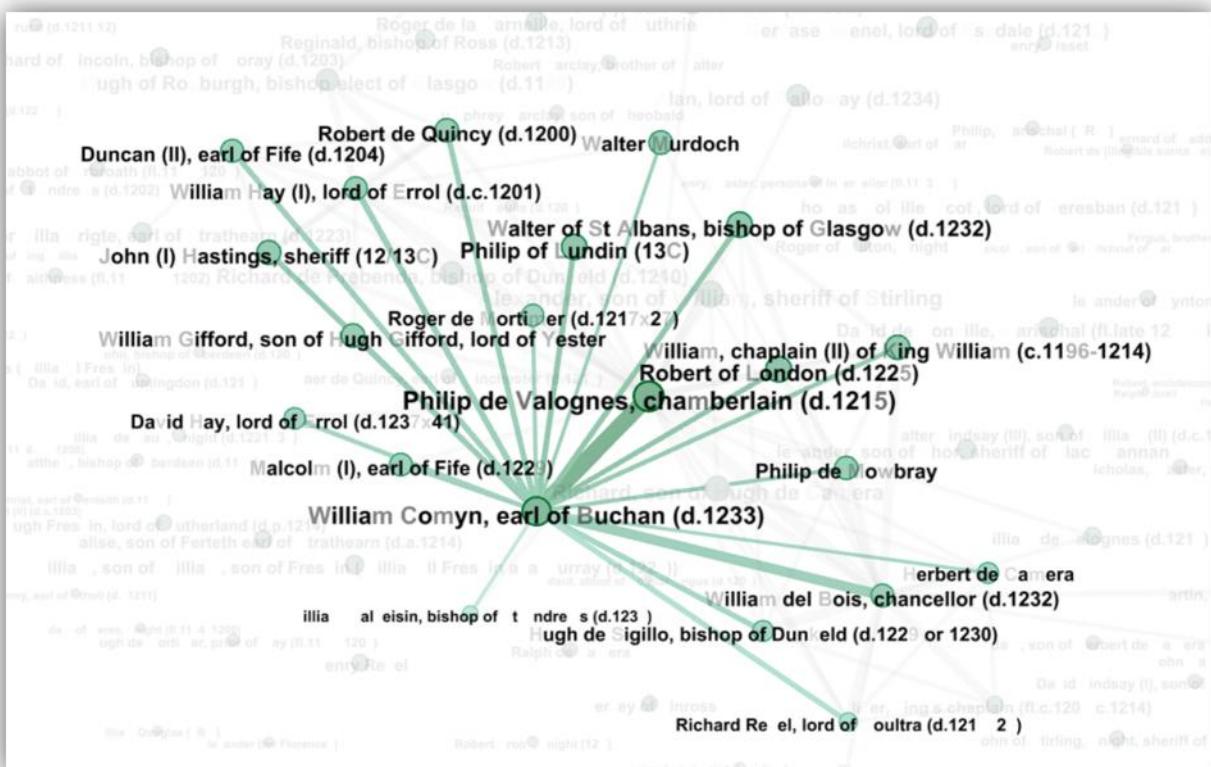


Figure 5.152. Connections of Philip de Valognes, > 5 level

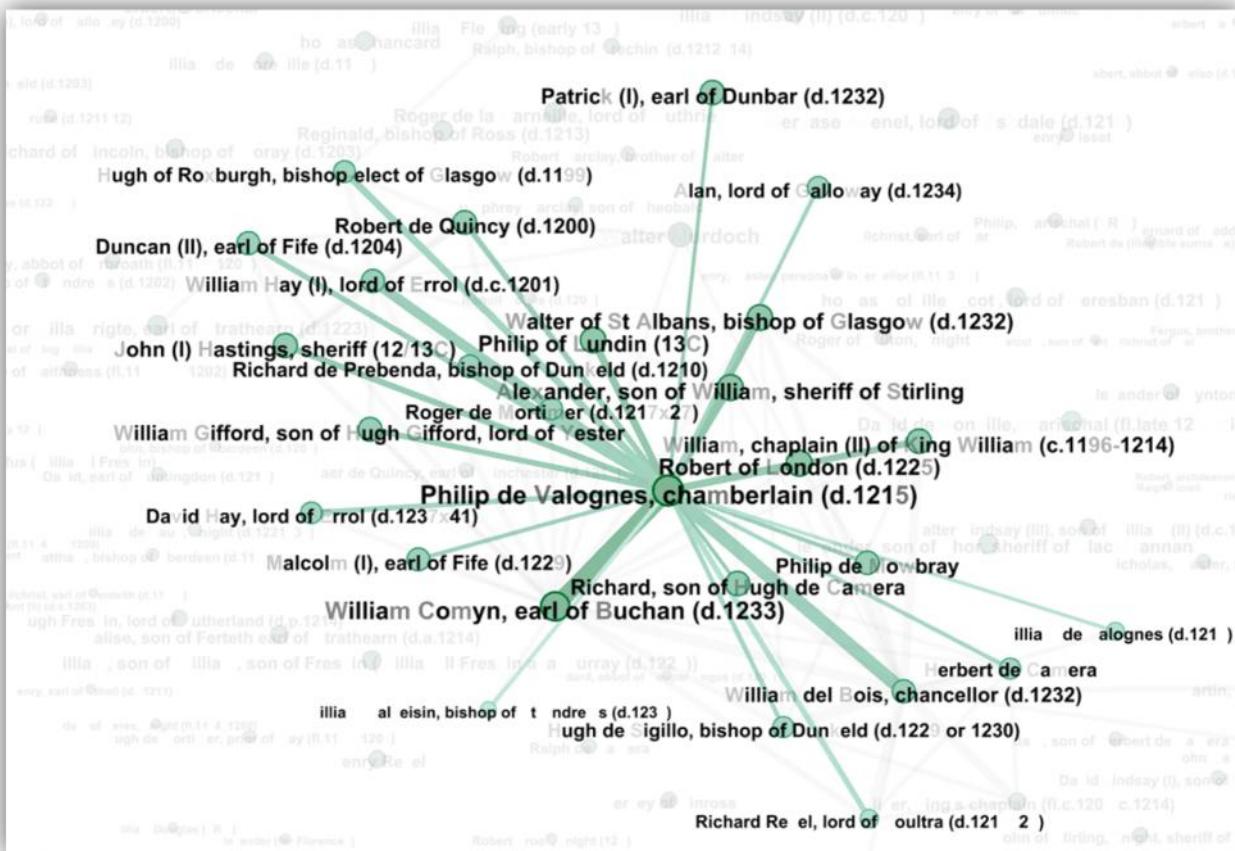
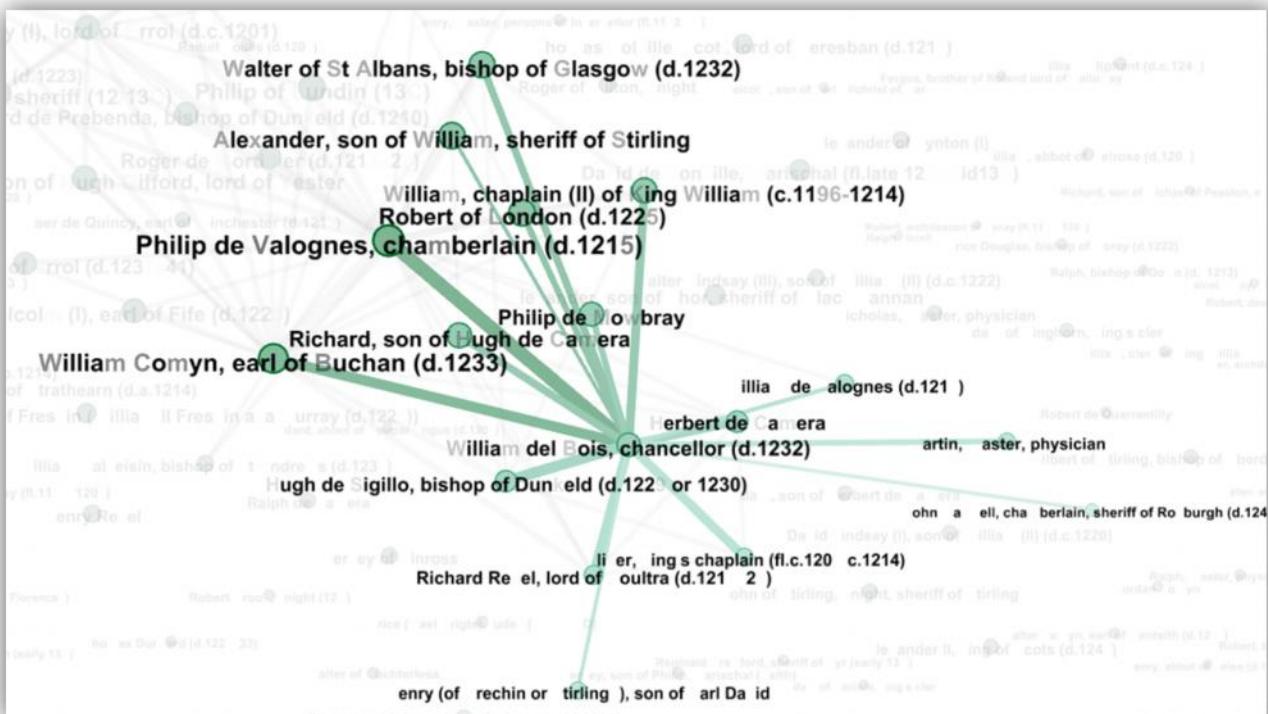


Figure 5.153. Connections of William del Bois, > 5 level



## ALEXANDER II, TIME SLICE 1 (1214-1225)

There were 94 documents in the period of a potential 106, 93 of these charters and one notification. 89 documents were definitely in the period and 5 were possibly in the period. There were 122 witnesses, all of them men. There were 122 witnesses in the study, all men, with 1250 edges between them.

Table 5.52. Top 15 actors by degree (churchmen in italics)

Poms ID	Name	Degree	Eigenvector	Betweeness
42	<i>William del Bois, chancellor (d.1232)</i>	88	1	984.6604
52	<i>Thomas of Stirling, clerk, archdeacon of Glasgow (d.1227)</i>	83	0.930462	1020.615
1281	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	79	0.949075	664.2043
3998	<i>Robert, king's chaplain (TRA2)</i>	63	0.860658	304.0031
1357	Walter Comyn, earl of Menteith (d.1258)	57	0.784616	264.6533
1389	John Hay (I), lord of Naughton (d.xOct.1266)	57	0.809845	188.7978
16	William Comyn, earl of Buchan (d.1233)	56	0.744063	236.8733
1106	Philip de Mowbray	55	0.73288	283.9199
782	Malcolm (I), earl of Fife (d.1229)	54	0.787715	148.7102
171	Thomas Durward (d.1228x33)	51	0.710562	289.7862
1420	Henry Balliol (d.1246)	51	0.650284	233.6262
1285	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	50	0.696049	173.451
1135	David de Bonville, marischal (fl.late 12C-mid13C)	48	0.68367	163.6992
62	Ingram Balliol (d.1239x44)	43	0.606318	114.8845
815	<i>Robert, bishop of Ross (d.1249)</i>	43	0.638059	207.7399
2115	Walter Lindsay (III), son of William (II) (d.c.1222)	43	0.683829	66.52758

Table 5.53. Top 15 actors by eigenvector (churchmen in italics)

Poms ID	Name	Degree	Eigenvector
42	<i>William del Bois, chancellor (d.1232)</i>	88	1
1281	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	79	0.949075
52	<i>Thomas of Stirling, clerk, archdeacon of Glasgow (d.1227)</i>	83	0.930462
3998	<i>Robert, king's chaplain (TRA2)</i>	63	0.860658
1389	John Hay (I), lord of Naughton (d.xOct.1266)	57	0.809845
782	Malcolm (I), earl of Fife (d.1229)	54	0.787715
1357	Walter Comyn, earl of Menteith (d.1258)	57	0.784616

<b>16</b>	William Comyn, earl of Buchan (d.1233)	56	0.744063
<b>1106</b>	Philip de Mowbray	55	0.73288
<b>171</b>	Thomas Durward (d.1228x33)	51	0.710562
<b>1285</b>	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	50	0.696049
<b>2115</b>	Walter Lindsay (III), son of William (II) (d.c.1222)	43	0.683829
<b>1135</b>	David de Bonville, marischal (fl.late 12C-mid13C)	48	0.68367
<b>1420</b>	Henry Balliol (d.1246)	51	0.650284
<b>815</b>	<i>Robert, bishop of Ross (d.1249)</i>	43	0.638059

The chancellor William del Bois is unequivocally the most central person in the first decade of Alexander II's reign, followed (in degree) by his clerk and successor Thomas of Stirling. The royal chaplain Robert was also in the top five most central persons by degree and eigenvector. The dominance of household clerics in witness lists marks something of a step change from the late period of King William's reign. William del Bois also witnessed far more documents than his contemporaries, over 20 more than the most central laymen. The importance of sheriffs continued to increase, as John Maxwell was the most central layman. He would become chamberlain later in Alexander's reign, but in this period he was alternately sheriff of Roxburgh and Berwick. John Maxwell's eigenvector was about 95%. The importance of Maxwell, given that he held no household office and was not the son of anyone particularly important, is remarkable – his rise must be down to his personal characteristics and/or relationship with the king or other top actors. It is perhaps not surprising that he was soon to be given the coveted office of chamberlain. It also marks a shift to the border region of the kingdom as a centre of gravity southwards from the Edinburgh-Stirling-Perth triangle, where it rested before. That said, John Hay, lord of Naughton in Fife, who was at times sheriff of Fife and of Perth, was also high in the league tables. Malcolm (I) earl of Fife (d.1229) seems to rise to a higher position of prominence under Alexander II, with an eigenvector of 79%. Both John Hay (I) and Earl Malcolm were sons of two of the most central players in the second time slice of William's reign, [24] William Hay (I) and [13] Earl Duncan (II). Surprisingly, William Comyn, earl of Buchan (d. 1233), who was justice or justiciar during this period, has fallen to a middling position, even behind his own son, Walter Comyn, who was yet to marry into the earldom of Menteith. The baron Philip de Mowbray had an important role in this period. There is still no sign of the formerly key roles of steward and constable, but two new household officers rise to prominence in this period, the doorward and the marischal. Walter Oliphant, who became justiciar of Lothian about halfway through this period, shows up relatively low. It could be that, as royal justices, Comyn and Oliphant were spending more time away from the king than had justices in the twelfth century.

Table 5.54. Positions held by top actors (churchmen in italics)

Poms ID	Name	Position
<b>42</b>	<i>William del Bois, chancellor (d.1232)</i>	Chancellor (ca 1210 – ca 1225)
<b>52</b>	<i>Thomas of Stirling, clerk, archdeacon of Glasgow (d.1227)</i>	King's clerk; archdeacon of Glasgow
<b>1281</b>	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	Sheriff of Roxburgh; sheriff of Berwick
<b>3998</b>	<i>Robert, king's chaplain (TRA2)</i>	King's chaplain
<b>1357</b>	Walter Comyn, earl of Menteith (d.1258)	Son of William Comyn, earl of Buchan
<b>1389</b>	John Hay (I), lord of Naughton (d.xOct.1266)	Sheriff of Fife, Sheriff of Perth
<b>16</b>	William Comyn, earl of Buchan (d.1233)	Justiciar (ca 1205 – ca 1232)
<b>1106</b>	Philip de Mowbray	Baron
<b>782</b>	<i>Malcolm (I), earl of Fife (d.1229)</i>	Earl of Fife
<b>171</b>	Thomas Durward (d.1228x33)	Doorward/ usher
<b>1420</b>	Henry Balliol (d.1246)	Chamberlain (ca 1223 – 1231)
<b>1285</b>	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	Justiciar of Lothian (1220-42)
<b>1135</b>	David de Bonville, marischal (fl.late 12C-mid13C)	King's marischal
<b>62</b>	Ingram Balliol (d.1239x44)	Sheriff of Berwick
<b>815</b>	<i>Robert, bishop of Ross (d.1249)</i>	Bishop of Ross
<b>2115</b>	Walter Lindsay (III), son of William (II) (d.c.1222)	Sheriff/ constable of Berwick

Table 5.55. Documents witnessed by top actors (churchmen in italics)

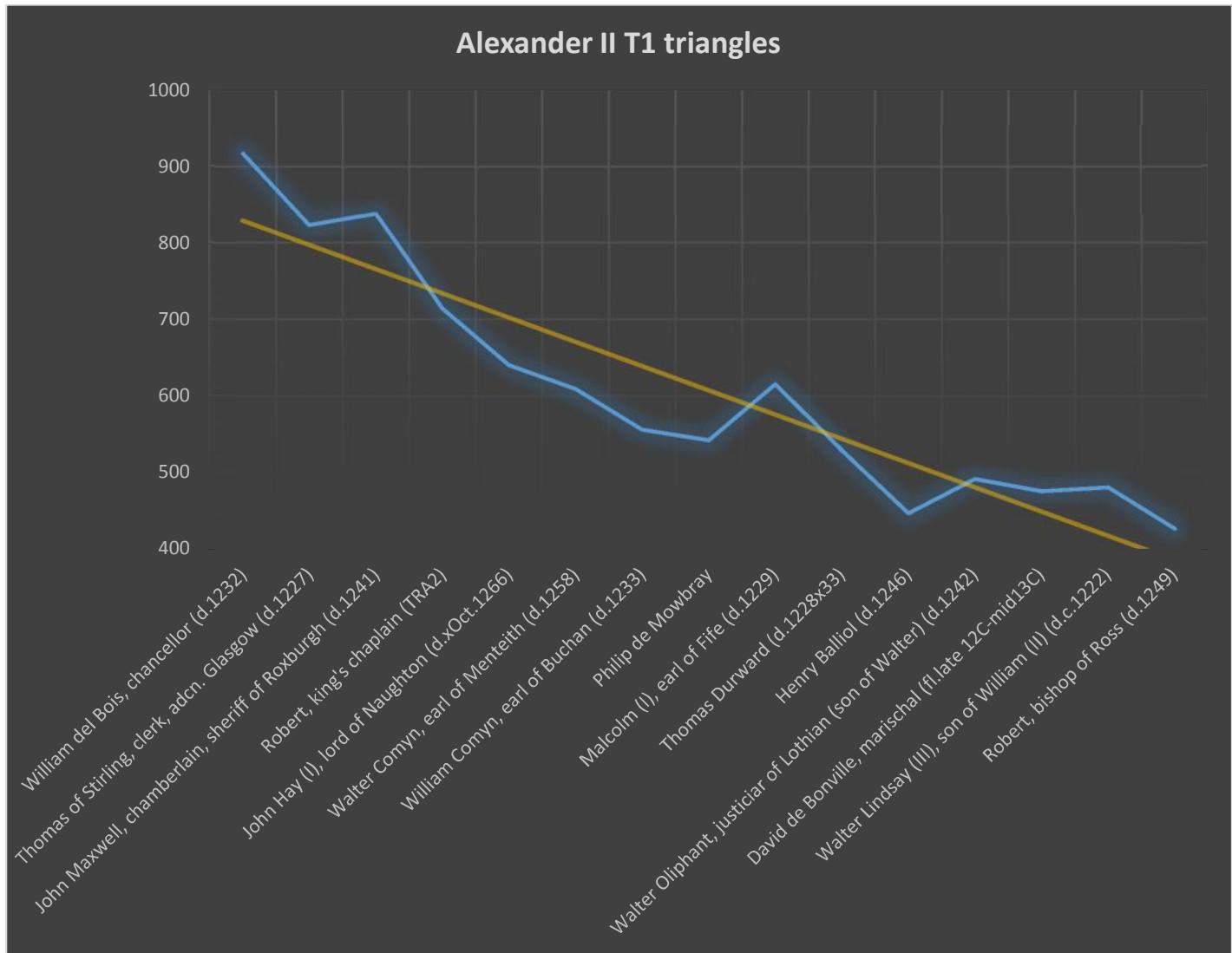
ID	Person	#AT1 docs witnessed	% AT1 docs witnessed	Docs/ year (11 years)	Degree/ docs witnessed
<b>42</b>	<i>William del Bois, chancellor (d.1232)</i>	58	61.7%	5.27	1.52
<b>52</b>	<i>Thomas of Stirling, clerk, archdeacon of Glasgow (d.1227)</i>	30	31.9%	2.73	2.77
<b>1281</b>	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	34	36.2%	3.09	2.33
<b>3998</b>	<i>Robert, king's chaplain (TRA2)</i>	20	21.3%	1.82	3.15
<b>1357</b>	Walter Comyn, earl of Menteith (d.1258)	19	20.2%	1.73	3
<b>1389</b>	John Hay (I), lord of Naughton (d.xOct.1266)	16	17%	1.45	3.56
<b>16</b>	William Comyn, earl of Buchan (d.1233)	33	35.1%	3	1.7
<b>1106</b>	Philip de Mowbray	14	14.9%	1.27	3.93
<b>782</b>	<i>Malcolm (I), earl of Fife (d.1229)</i>	23	24.5%	2.09	2.35
<b>171</b>	Thomas Durward (d.1228x33)	14	14.9%	1.27	3.64
<b>1420</b>	Henry Balliol (d.1246)	22	23.4%	2	2.32
<b>1285</b>	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	19	20.2%	1.73	2.63
<b>1135</b>	David de Bonville, marischal (fl.late 12C-mid13C)	15	16%	1.36	3.2

William del Bois, the chancellor, had a very low quotient of degree divided by number of documents witnessed, having witnessed a remarkable 61.7 percent of royal documents in this period. William Comyn, earl of Buchan also had a very low quotient, 1.7, showing he was very well connected despite witnessing relatively few charters. The relatively low quotients of Henry Balliol and Walter Oliphant could suggest that they were more significant than they otherwise appear. Looking at the table of documents witnessed, it is noteworthy that William de Valognes, the son of Philip de Valognes, who followed him as chamberlain, witnessed only 11 documents. However, this is partially due to his dying before June 1219.

Table 5.56. Numbers of documents (SD) witnessed (11 or more)

PoMS ID	Name	Docs witnessed
<b>42</b>	William del Bois, chancellor (d.1232)	58
<b>1281</b>	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	34
<b>16</b>	William Comyn, earl of Buchan (d.1233)	33
<b>52</b>	Thomas of Stirling, clerk, archdeacon of Glasgow (d.1227)	30
<b>782</b>	Malcolm (I), earl of Fife (d.1229)	23
<b>1420</b>	Henry Balliol (d.1246)	22
<b>3998</b>	Robert, king's chaplain (TRA2)	20
<b>1357</b>	Walter Comyn, earl of Menteith (d.1258)	19
<b>1285</b>	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	19
<b>1389</b>	John Hay (I), lord of Naughton (d.xOct.1266)	16
<b>1135</b>	David de Bonville, marischal (fl.late 12C-mid13C)	15
<b>62</b>	Ingram Balliol (d.1239x44)	15
<b>2115</b>	Walter Lindsay (III), son of William (II) (d.c.1222)	15
<b>1106</b>	Philip de Mowbray	14
<b>171</b>	Thomas Durward (d.1228x33)	14
<b>916</b>	Alexander, son of William, sheriff of Stirling	13
<b>64</b>	Henry of Stirling, son of Earl David	12
<b>832</b>	William de Valognes (d.1219)	11
<b>9634</b>	Hervey, son of Philip, marischal (Keith)	11
<b>40</b>	William Malveisin, bishop of St Andrews (d.1238)	11

Figure 5.154. Top 15 by degree, number of triangles



Looking at the numbers of triangles (Figure 5.154), we see that William del Bois and John Maxwell have more triangles than the trendline would predict, as is Malcolm (I), earl of Fife. John Hay, Walter Comyn, William Comyn, and Henry Balliol all fall significantly below the trendline.

Table 5.57 shows the pairs who witnessed most together. The chancellor William del Bois dominates the list, as part of 4 of the top 5 relationships, and 12 of the top 20. Perhaps surprisingly, he witnessed more often with William Comyn than with John Maxwell, the other most central person. Malcolm, earl of Fife, Walter Lindsay (III), and Walter Oliphant all appear rather higher here than they did in the centrality league tables. Despite witnessing 23 documents with the chancellor, William Comyn, earl of Buchan, is involved in none of the other top witnessing pairs.

Table 5.57. Pairs who witnessed together 10 or more times

Person 1	Person 2	#docs
William del Bois, chancellor (d.1232)	William Comyn, earl of Buchan (d.1233)	23
William del Bois, chancellor (d.1232)	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	20
William del Bois, chancellor (d.1232)	Malcolm (I), earl of Fife (d.1229)	18
William del Bois, chancellor (d.1232)	Walter Lindsay (III), son of William (II) (d.c.1222)	14
John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	14
William del Bois, chancellor (d.1232)	Robert, king's chaplain (TRA2)	13
William del Bois, chancellor (d.1232)	John Hay (I), lord of Naughton (d.xOct.1266)	12
William del Bois, chancellor (d.1232)	Thomas of Stirling, clerk, archdeacon of Glasgow (d.1227)	12
William del Bois, chancellor (d.1232)	Philip de Mowbray	12
William del Bois, chancellor (d.1232)	Alexander, son of William, sheriff of Stirling	12
Malcolm (I), earl of Fife (d.1229)	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	12
John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	Henry Balliol (d.1246)	12
William del Bois, chancellor (d.1232)	Walter Comyn, earl of Menteith (d.1258)	11
Malcolm (I), earl of Fife (d.1229)	William Comyn, earl of Buchan (d.1233)	11
Robert, king's chaplain (TRA2)	Thomas of Stirling, clerk, archdeacon of Glasgow (d.1227)	11
John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	Thomas of Stirling, clerk, archdeacon of Glasgow (d.1227)	11
William del Bois, chancellor (d.1232)	William de Valognes (d.1219)	10
William del Bois, chancellor (d.1232)	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	10
Ingram Balliol (d.1239x44)	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	10
Henry Balliol (d.1246)	Henry of Stirling, son of Earl David	10

Figure 5.155. Netdraw. Witnesses to Alexander II, Time Slice I (1214-1225)

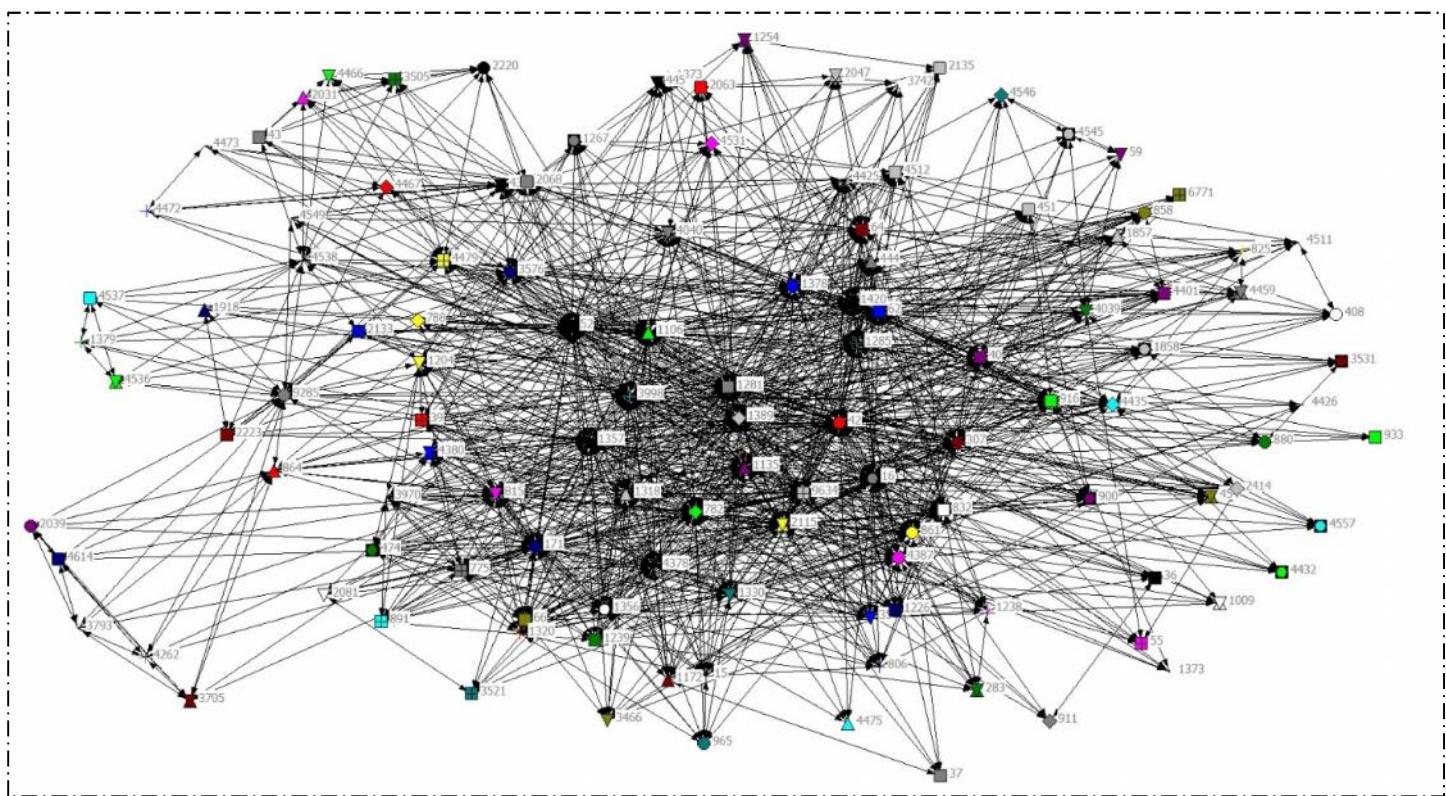


Figure 5.156. Netdraw. Alexander II T1 witnesses, more than 5 co-witnessing acts

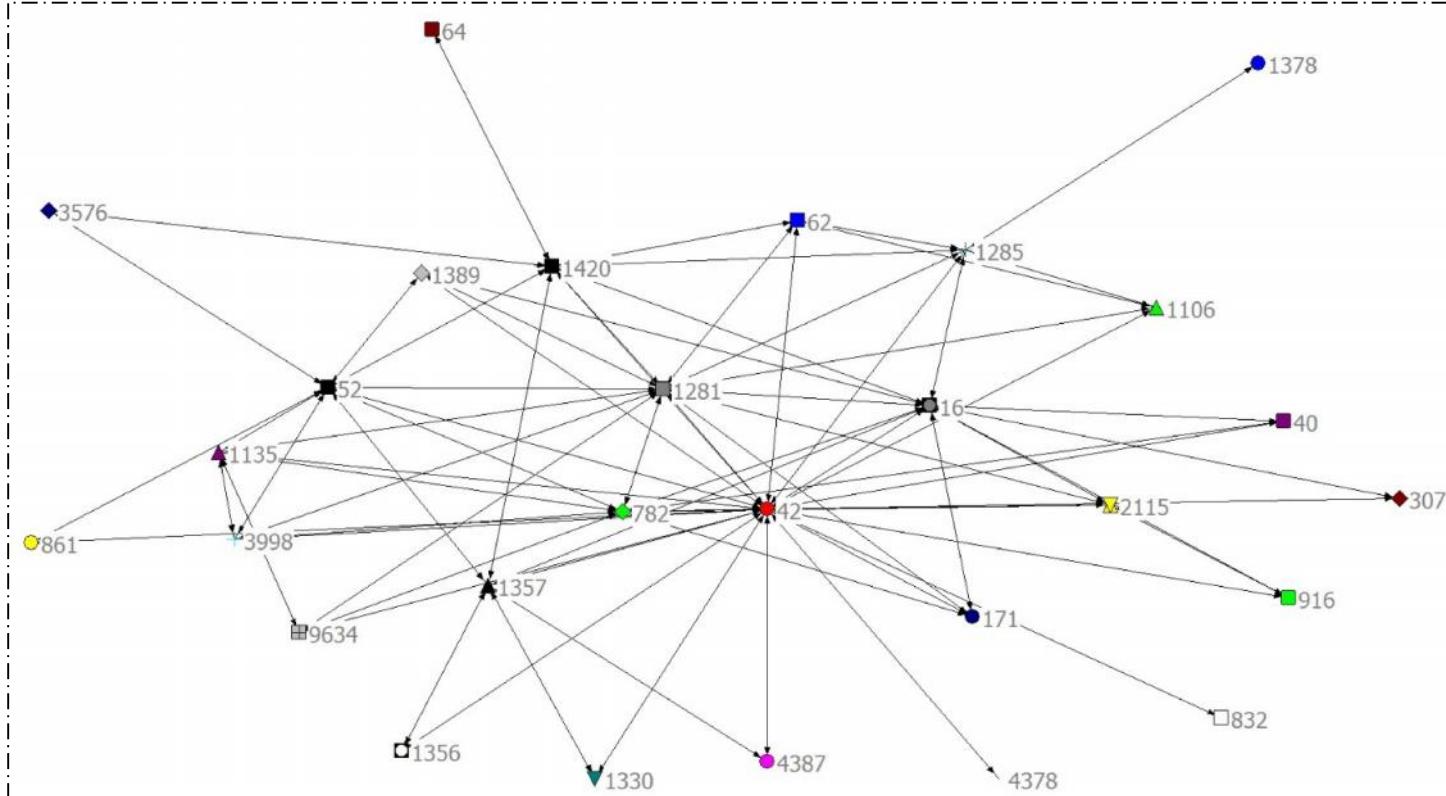


Figure 5.157. Gephi. Alexander II T1 witnesses, more than 5 co-witnessing acts

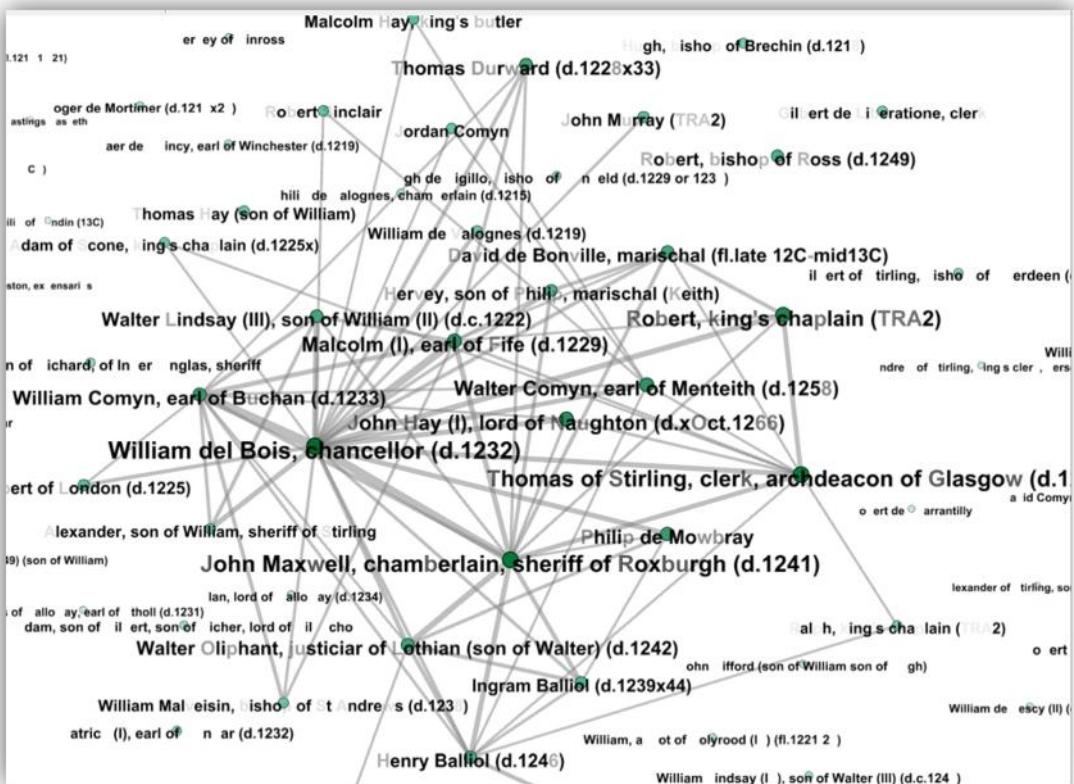


Figure 5.158. Gephi. Connections of William del Bois, chancellor, more than 5 acts

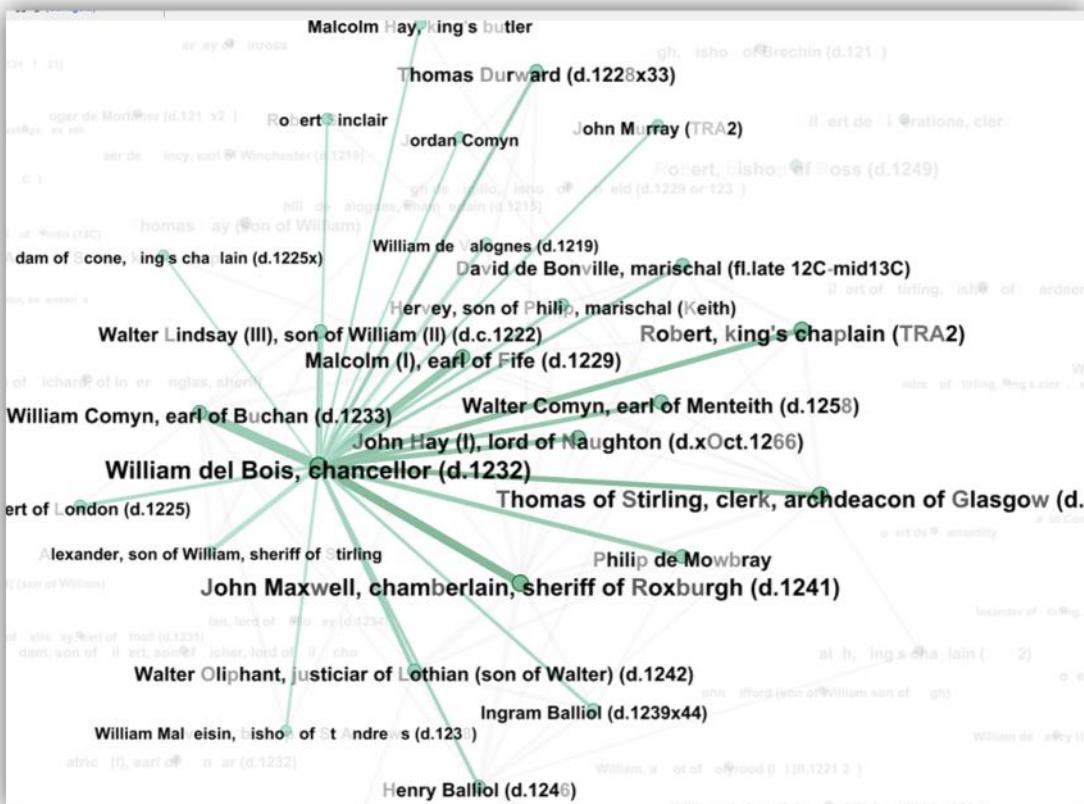


Figure 5.159. Gephi. Connections of William Comyn, earl of Buchan, more than 5 acts

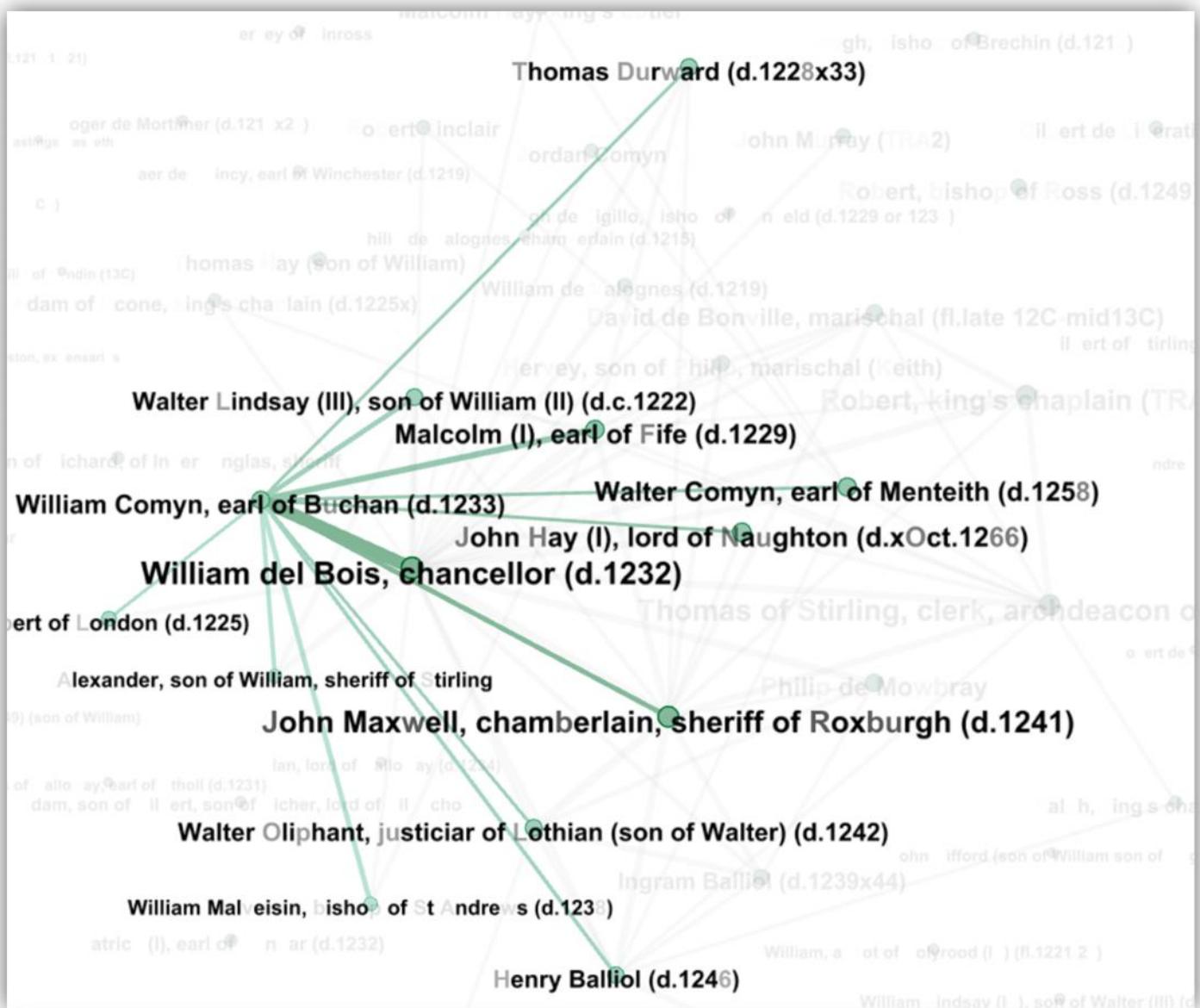
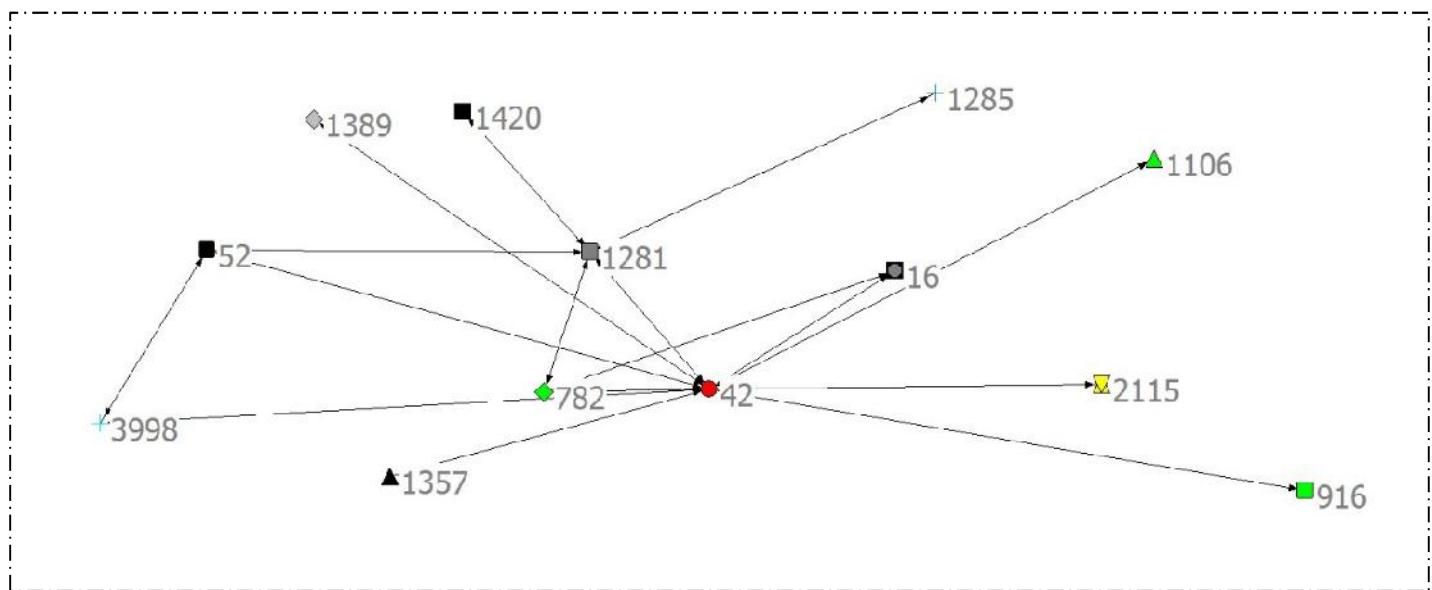


Figure 5.160. Netdraw. Alexander II T1 witnesses, more than 10 co-witnessing acts



KEY:

<b>42</b>	<i>William del Bois, chancellor (d.1232)</i>
<b>52</b>	<i>Thomas of Stirling, clerk, archdeacon of Glasgow (d.1227)</i>
<b>1281</b>	<i>John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)</i>
<b>3998</b>	<i>Robert, king's chaplain (TRA2)</i>
<b>1357</b>	<i>Walter Comyn, earl of Menteith (d.1258)</i>
<b>1389</b>	<i>John Hay (I), lord of Naughton (d.xOct.1266)</i>
<b>16</b>	<i>William Comyn, earl of Buchan (d.1233)</i>
<b>1106</b>	<i>Philip de Mowbray</i>
<b>782</b>	<i>Malcolm (I), earl of Fife (d.1229)</i>
<b>1420</b>	<i>Henry Balliol (d.1246)</i>
<b>1285</b>	<i>Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)</i>
<b>916</b>	<i>Alexander, son of William, sheriff of Stirling</i>
<b>2115</b>	<i>Walter Lindsay (III), son of William (II) (d.c.1222)</i>

Figure 5.160 shows the central role of [42] William del Bois in this period. He is the sole connector at the level of more than 10 co-witnessing acts for other key actors, like [1357] Walter Comyn, [2115] Walter Lindsay, and [1106] Philip de Mowbray. This is not a very highly interconnected sociogram. There are only four cliques, all triads, and all including William del Bois: 42-3998-52; 42-52-1281; 42-782-1281; 42-782-16. Figure 5.162 shows the co-witnessing relationships at more than 15 acts. This shows that Malcolm earl of Fife and William Comyn earl of Buchan continued to be important in terms of links with the two most central actors, William del Bois and John Maxwell.

Figure 5.161. Gephi. Alexander II T1 witnesses, more than 10 co-witnessing acts

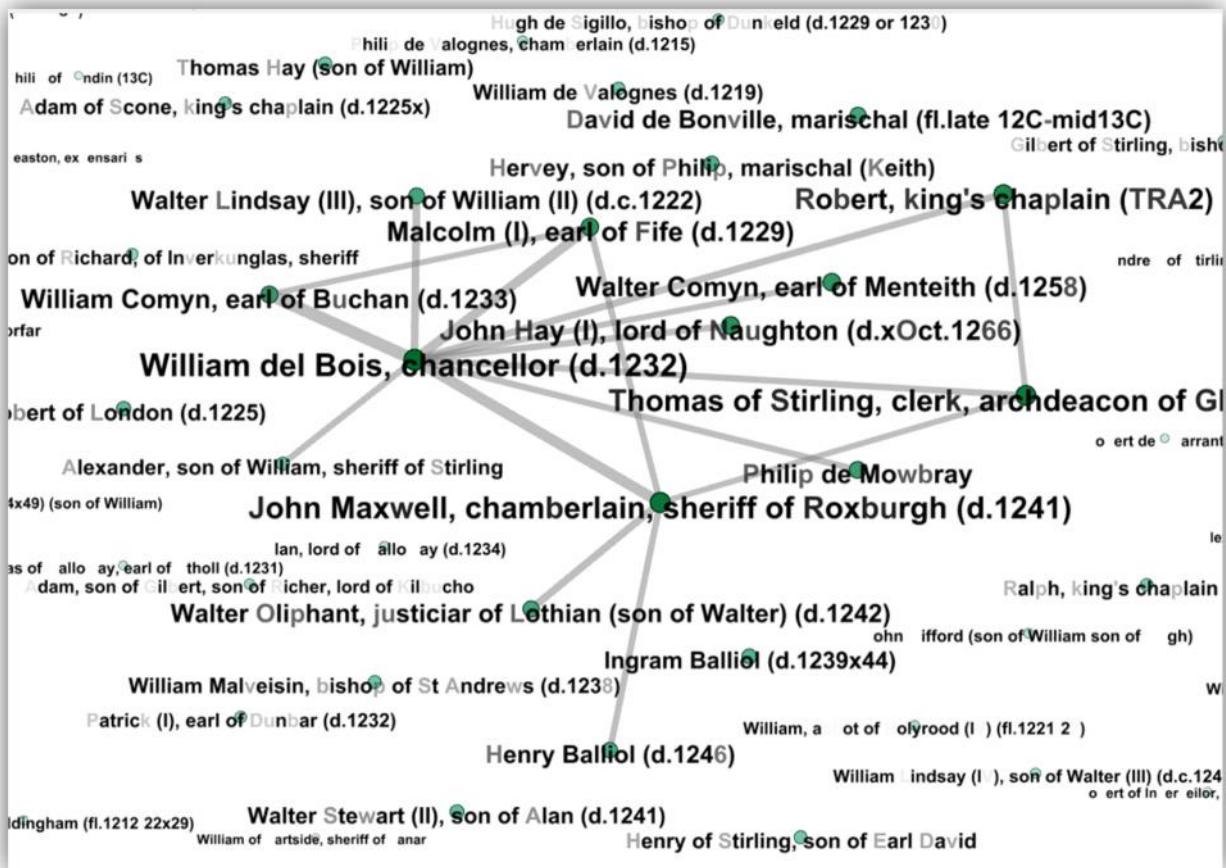


Figure 5.162. Netdraw. Alexander II T1 witnesses, more than 15 co-witnessing acts

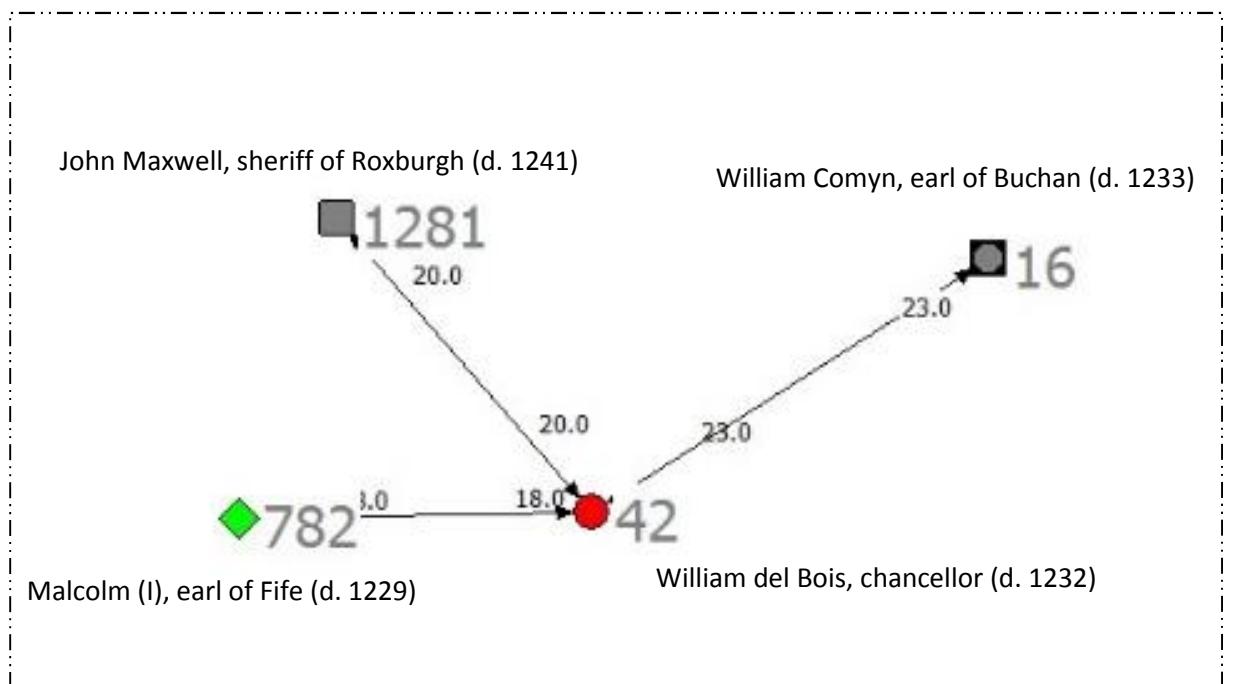
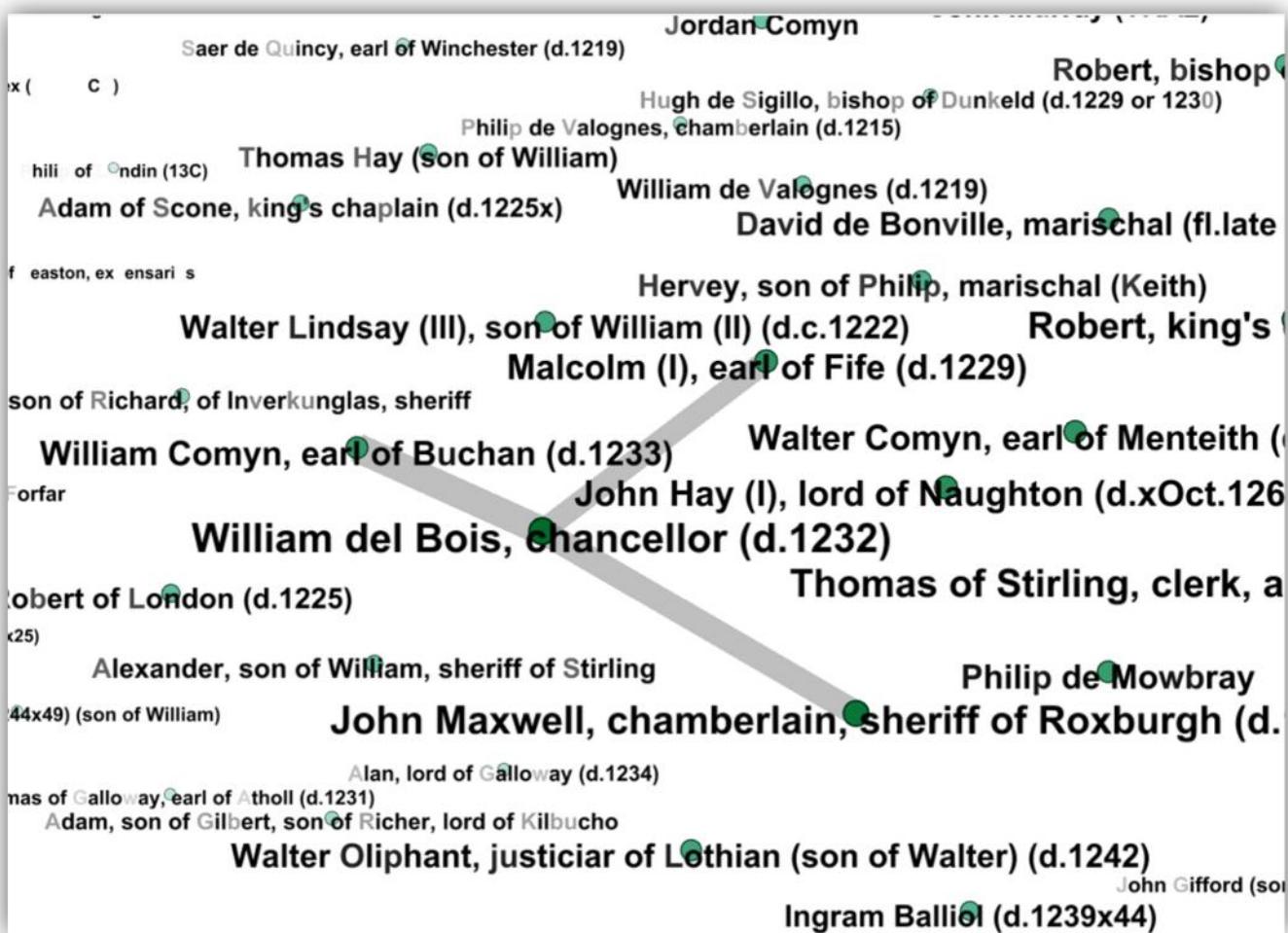


Figure 5.163. Gephi. Alexander II T1 witnesses, more than 15 co-witnessing acts



## ALEXANDER II, TIME SLICE 2 (1225-36)

The second time slice of Alexander II's reign lasted for 11 years from 1225 to 1236. The king's chapel adopted the date by regnal year in 1222, allowing for more precise dating of royal charters. There are 123 documents out of a potential 144. Of these, 119 were charters strictly speaking, three were charter/briefes, and one was a notification. Of these 123 documents, 117 were definitely in the period and six were possibly in the period. There were 170 witnesses in the study, with 1824 edges.

Table 5.58. Top 15 actors by degree (churchmen in italics)

Poms ID	Name	Degree	Eigenvector	Betweenness
<b>1357</b>	Walter Comyn, earl of Menteith (d.1258)	99	1	1203.962
<b>435</b>	<i>William of Bondington, bishop of Glasgow (d.1258)</i>	94	0.905546	1475.282
<b>1285</b>	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	92	0.933715	1116.41
<b>2068</b>	Walter Bisset (13C)	91	0.922741	1028.63
<b>1378</b>	Walter Stewart (II), son of Alan (d.1241)	90	0.925127	1029.103
<b>1420</b>	Henry Balliol (d.1246)	79	0.850971	743.6976
<b>1135</b>	David de Bonville, marischal (fl.late 12C-mid13C)	71	0.833119	448.3149
<b>864</b>	<i>Matthew Scott, bishop-elect of Dunkeld (d.1230)</i>	70	0.771487	536.6571
<b>62</b>	Ingram Balliol (d.1239x44)	66	0.823686	300.8966
<b>4302</b>	<i>Thomas, son of Ranulf (d. 1262)</i>	66	0.819518	292.9246
<b>1389</b>	John Hay (I), lord of Naughton (d.xOct.1266)	61	0.739741	308.8688
<b>1281</b>	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	58	0.714893	332.1303
<b>4549</b>	Alexander of Stirling, son of Patrick	57	0.712295	278.713
<b>445</b>	Patrick (II), earl of Dunbar (d.1248)	56	0.710235	196.5921
<b>16</b>	William Comyn, earl of Buchan (d.1233)	56	0.678684	196.021

Table 5.59. Top 15 actors by eigenvector (churchmen in italics)

Poms ID	Name	Degree	Eigenvector
<b>1357</b>	Walter Comyn, earl of Menteith (d.1258)	99	1
<b>1285</b>	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	92	0.933715
<b>1378</b>	Walter Stewart (II), son of Alan (d.1241)	90	0.925127
<b>2068</b>	Walter Bisset (13C)	91	0.922741
<b>435</b>	<i>William of Bondington, bishop of Glasgow (d.1258)</i>	94	0.905546
<b>1420</b>	Henry Balliol (d.1246)	79	0.850971
<b>1135</b>	David de Bonville, marischal (fl.late 12C-mid13C)	71	0.833119
<b>62</b>	Ingram Balliol (d.1239x44)	66	0.823686
<b>4302</b>	<i>Thomas, son of Ranulf (d. 1262)</i>	66	0.819518
<b>864</b>	<i>Matthew Scott, bishop-elect of Dunkeld (d.1230)</i>	70	0.771487
<b>1389</b>	John Hay (I), lord of Naughton (d.xOct.1266)	61	0.739741

<b>1281</b>	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	58	0.714893
<b>4549</b>	Alexander of Stirling, son of Patrick	57	0.712295
<b>445</b>	Patrick (II), earl of Dunbar (d.1248)	56	0.710235
<b>4284</b>	David Lindsay (II), son of David (I), lord of Luffness (d.1241)	55	0.704588

Walter Comyn, earl of Menteith (d. 1258), holds the dominant position in this 1225 to 1236 period. This is remarkable given that he held no household office and was not a justiciar. His position as de uxore earl of Menteith also had little to do with his dominance, given that no earls of Menteith have previously appeared in centrality league tables. Instead, his power, which was already on the rise in the period 1214-25, seems to rest in his having inherited the strategic network and power structures built up by his father, William Comyn, earl of Buchan (d. 1233). The two justiciars, Walter Oliphant (Lothian) and Walter Stewart (II) (Scotia), however, also held very central positions, with eigenvectors around 93% that of Walter Comyn. This also marks the return of the steward to a central position in the kingdom. The baron Walter Bisset (this was a real 'age of Walters') also held a key position in Alexander's household. Ecclesiastics are less important than ever in terms of the king's witnesses, with the only top actors being royal clerks or chancellors. The only other earl to appear is Patrick (II), earl of Dunbar, who took over on his father's death in 1232. Despite succeeding to the earldom of Fife after Malcolm (I)'s death in 1229, Malcolm (II) earl of Fife appears very low indeed in the rankings, with an eigenvector score of only 35%.

Table 5.60. Positions held by top actors (churchmen in italics)

Poms ID	Name	Position
<b>1357</b>	Walter Comyn, earl of Menteith (d.1258)	Earl of Menteith, ca 1233 - 1258
<b>435</b>	William of Bondington, bishop of Glasgow (d.1258)	Chancellor, ca 1231 – ca 1247
<b>1285</b>	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	Justiciar of Lothian (-1241)
<b>2068</b>	Walter Bisset (13C)	Baron
<b>1378</b>	Walter Stewart (II), son of Alan (d.1241)	Justiciar of Scotia, 1232 -1241
<b>1420</b>	Henry Balliol (d.1246)	Chamberlain, 1219x23 – ca 1230
<b>1135</b>	David de Bonville, marischal (fl.late 12C-mid13C)	King's marischal
<b>864</b>	Matthew Scott, bishop-elect of Dunkeld (d.1230)	Chancellor, ca 1227 – ca 1230
<b>62</b>	Ingram Balliol (d.1239x44)	Baron
<b>4302</b>	Thomas, son of Ranulf (d. 1262)	King's clerk
<b>1389</b>	John Hay (I), lord of Naughton (d.xOct.1266)	Sheriff of Perth, Sheriff of Fife
<b>1281</b>	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	Chamberlain, ca 1231 – 1233x35
<b>4549</b>	Alexander of Stirling, son of Patrick	Man of Walter Comyn, e. Menteith
<b>445</b>	Patrick (II), earl of Dunbar (d.1248)	Earl of Dunbar (1232-48)
<b>16</b>	William Comyn, earl of Buchan (d.1233)	Justiciar of Scotia (- 1232)

Table 5.61. Documents witnessed by top actors

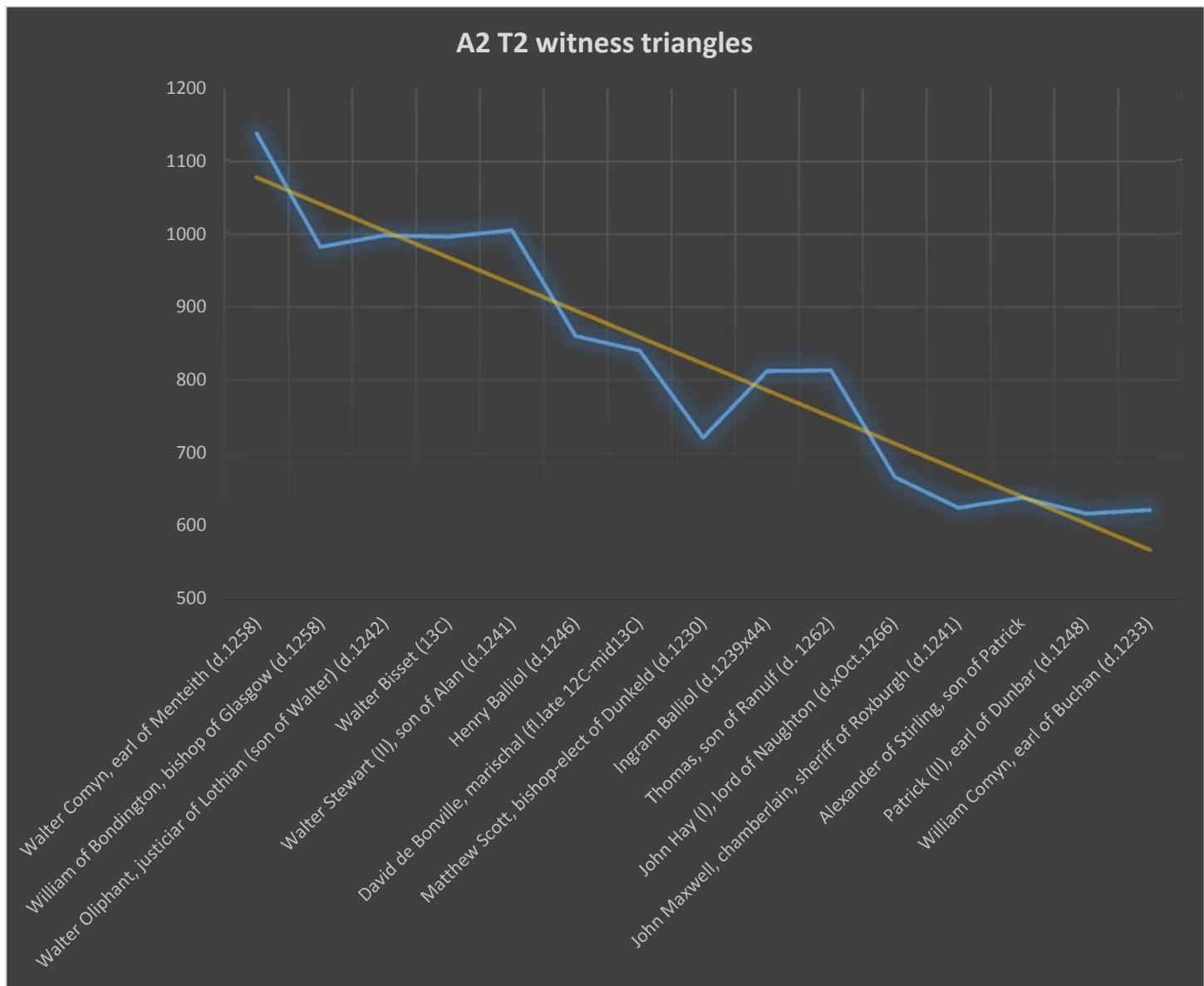
ID	Person	#AT2 docs witnessed	% AT2 docs witnessed	Docs/ year (11 years)	Degree/ docs witnessed
<b>1357</b>	Walter Comyn, earl of Menteith (d.1258)	36	29.3%	3.27	2.75
<b>435</b>	William of Bondington, bishop of Glasgow (d.1258)	41	33.3%	3.73	2.29
<b>1285</b>	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	46	37.4%	4.18	2
<b>2068</b>	Walter Bisset (13C)	28	22.8%	2.55	3.25
<b>1378</b>	Walter Stewart (II), son of Alan (d.1241)	51	41.4%	4.64	1.76
<b>1420</b>	Henry Balliol (d.1246)	28	22.8%	2.55	2.82
<b>1135</b>	David de Bonville, marischal (fl.late 12C-mid13C)	26	21.1%	2.36	2.73
<b>864</b>	Matthew Scott, bishop-elect of Dunkeld (d.1230)	23	18.7%	2.09	3.04
<b>62</b>	Ingram Balliol (d.1239x44)	14	11.4%	1.27	4.71
<b>4302</b>	Thomas, son of Ranulf (d. 1262)	17	13.8%	1.55	3.88

Walter Stewart (II), justiciar of Scotia, witnessed the most documents in this period, about 41%. We seem to be seeing a trend where the top players witness smaller percentages of the total documents than in earlier periods. Only Stewart and Walter Oliphant, justiciar of Lothian, witnessed more than a third of the documents, and most of the top players witnessed less than a quarter. As is common with chancellors, William of Bondington witnessed relatively many documents, for this dataset, but had a significantly lower eigenvector than degree ranking. Walter Stewart also had the lowest quotient of degree divided by documents witnessed.

Table 5.62. Numbers of documents (SD) witnessed (11 or more)

PoMS ID	Name	Docs witnessed
<b>1378</b>	Walter Stewart (II), son of Alan (d.1241)	51
<b>1285</b>	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	46
<b>435</b>	William of Bondington, bishop of Glasgow (d.1258)	41
<b>1357</b>	Walter Comyn, earl of Menteith (d.1258)	36
<b>2068</b>	Walter Bisset (13C)	28
<b>1420</b>	Henry Balliol (d.1246)	28
<b>1135</b>	David de Bonville, marischal (fl.late 12C-mid13C)	26
<b>864</b>	Matthew Scott, bishop-elect of Dunkeld (d.1230)	23
<b>1281</b>	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	23
<b>1389</b>	John Hay (I), lord of Naughton (d.xOct.1266)	19
<b>445</b>	Patrick (II), earl of Dunbar (d.1248)	18
<b>2223</b>	Roger Avenel, sheriff (d.1243)	17
<b>4302</b>	Thomas, son of Ranulf (d. 1262)	17
<b>4549</b>	Alexander of Stirling, son of Patrick	16
<b>4425</b>	William Lindsay (IV), son of Walter (III) (d.c.1247)	16
<b>16</b>	William Comyn, earl of Buchan (d.1233)	15
<b>52</b>	Thomas of Stirling, clerk, archdeacon of Glasgow (d.1227)	15
<b>62</b>	Ingram Balliol (d.1239x44)	14
<b>2302</b>	Bernard Fraser, sheriff of Stirling	14
<b>788</b>	Andrew Murray, bishop of Moray (d.1242)	13
<b>64</b>	Henry of Stirling, son of Earl David	13
<b>4284</b>	David Lindsay (II), son of David (I), lord of Luffness (d.1241)	12
<b>4660</b>	Roger, son of Glay	12
<b>1971</b>	Alan Durward (d.1275)	11
<b>3793</b>	Ralph de Campania (Champagne)	11
<b>1318</b>	Thomas Hay (son of William)	11

Figure 5.164. Top 15 by degree, number of triangles



As far as triangles for the top 15 actors by degree, we see that Walter Comyn, earl of Menteith, is overperforming the trendline while William of Bondington, the chancellor, is underperforming. This is not surprising, as the lead lay figure generally has significantly more triangles than the other key figures, while the chancellor tends to have a less interconnected group of contacts. Walter Stewart (II) also has more triangles than the trendline would suggest, while the other chancellor, Matthew Scot, also underperforms.

Table 5.63 shows the pairs who have witnessed together 10 or more times. The justiciars Walter Stewart and Walter Oliphant appear more prominently here than the eigenvector leader, Walter Comyn. Stewart is part of seven of the top 12 relationships, and Oliphant is part of 5 of the top 12. Comyn was only part of 3 of the top 12 relationships.

Table 5.63. Pairs who witnessed together 10 or more times

Person 1	Person 2	#docs
Walter Stewart (II), son of Alan (d.1241)	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	27
Walter Stewart (II), son of Alan (d.1241)	William of Bondington, bishop of Glasgow (d.1258)	21
Walter Comyn, earl of Menteith (d.1258)	Walter Stewart (II), son of Alan (d.1241)	19
Walter Stewart (II), son of Alan (d.1241)	Walter Bisset (13C)	15
Walter Comyn, earl of Menteith (d.1258)	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	14
Walter Stewart (II), son of Alan (d.1241)	David de Bonville, marischal (fl. late 12C-mid13C)	14
Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	Patrick (II), earl of Dunbar (d.1248)	14
Walter Comyn, earl of Menteith (d.1258)	Henry Balliol (d.1246)	13
Henry Balliol (d.1246)	Walter Stewart (II), son of Alan (d.1241)	13
Walter Stewart (II), son of Alan (d.1241)	Patrick (II), earl of Dunbar (d.1248)	13
Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	David de Bonville, marischal (fl. late 12C-mid13C)	13
Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	William of Bondington, bishop of Glasgow (d.1258)	13
William Comyn, earl of Buchan (d.1233)	Matthew Scott, bishop-elect of Dunkeld (d.1230)	12
Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	12
Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	Matthew Scott, bishop-elect of Dunkeld (d.1230)	12
Walter Comyn, earl of Menteith (d.1258)	John Hay (I), lord of Naughton (d.xOct.1266)	11
Walter Comyn, earl of Menteith (d.1258)	Matthew Scott, bishop-elect of Dunkeld (d.1230)	11
Roger Avenel, sheriff (d.1243)	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	11
Henry Balliol (d.1246)	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	11
Henry Balliol (d.1246)	Walter Bisset (13C)	11
Walter Stewart (II), son of Alan (d.1241)	Alan Durward (d.1275)	11
Walter Bisset (13C)	William of Bondington, bishop of Glasgow (d.1258)	11
Walter Comyn, earl of Menteith (d.1258)	Walter Bisset (13C)	10
Walter Stewart (II), son of Alan (d.1241)	John Hay (I), lord of Naughton (d.xOct.1266)	10

Figure 5.165. Netdraw. Witnesses to Alexander II Time Slice 2

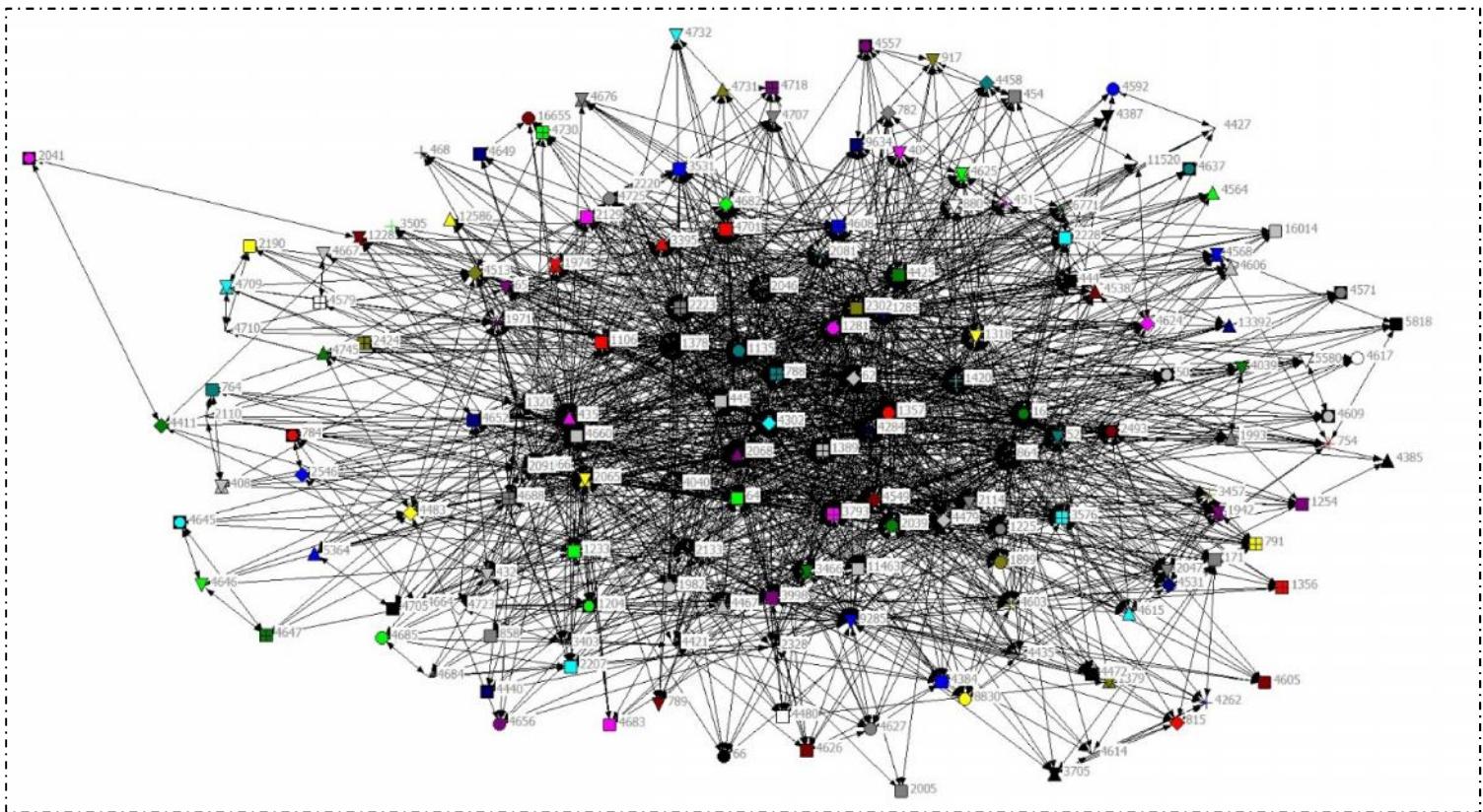


Figure 5.166. Gephi. Witnesses to Alexander II time slice 2

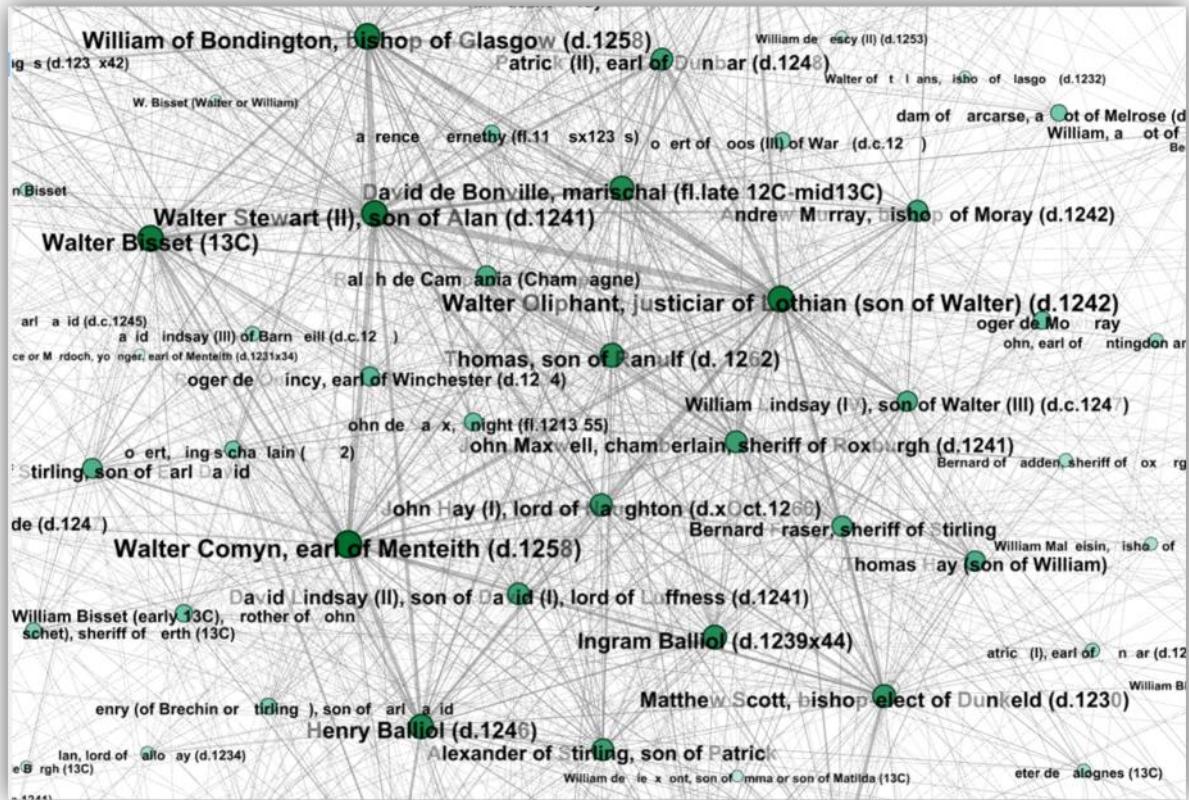


Figure 5.167. Netdraw. Alexander II, time slice 2, more than 5 co-witnessing acts

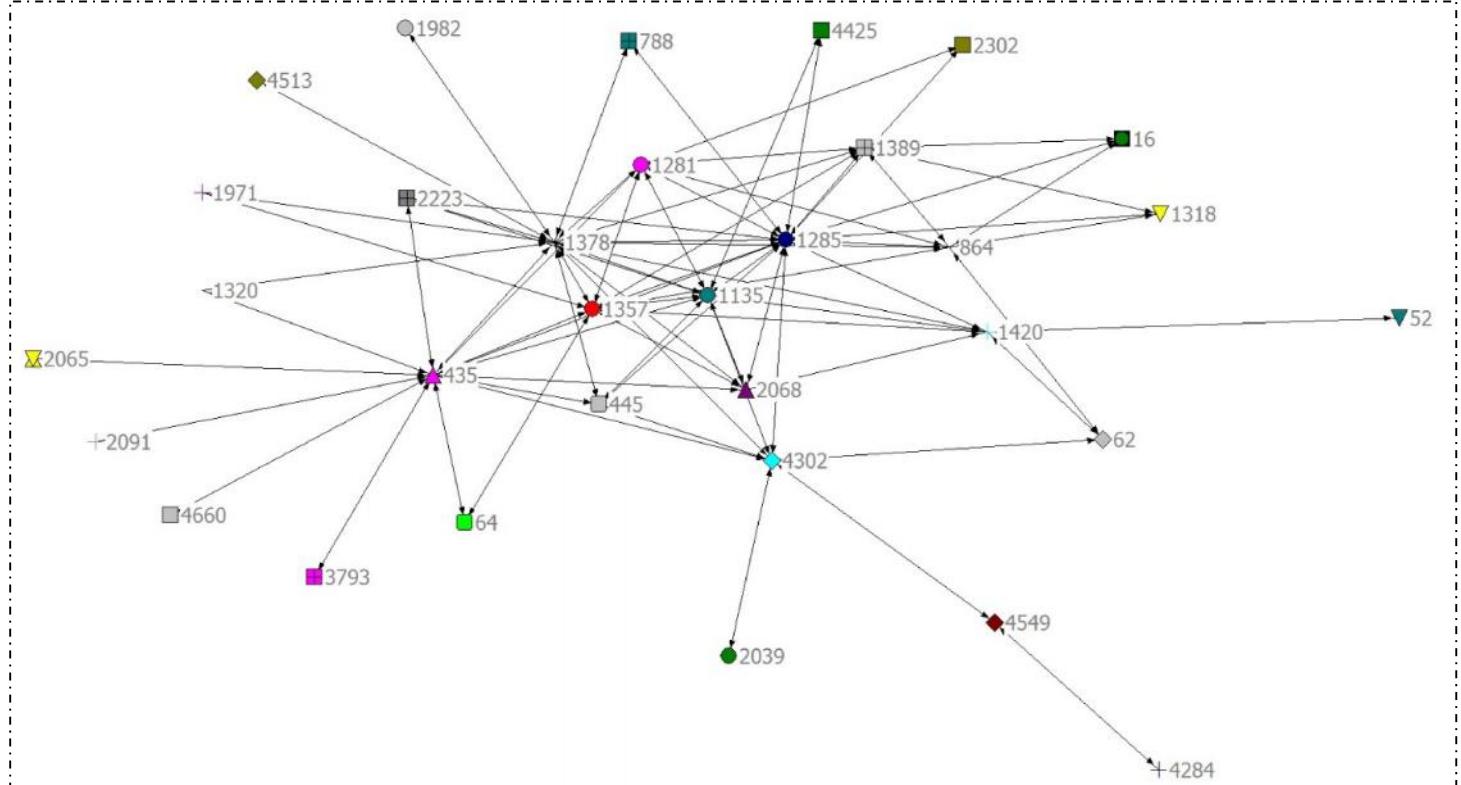


Figure 5.168. Gephi. Alexander II, time slice 2, more than 5 co-witnessing acts

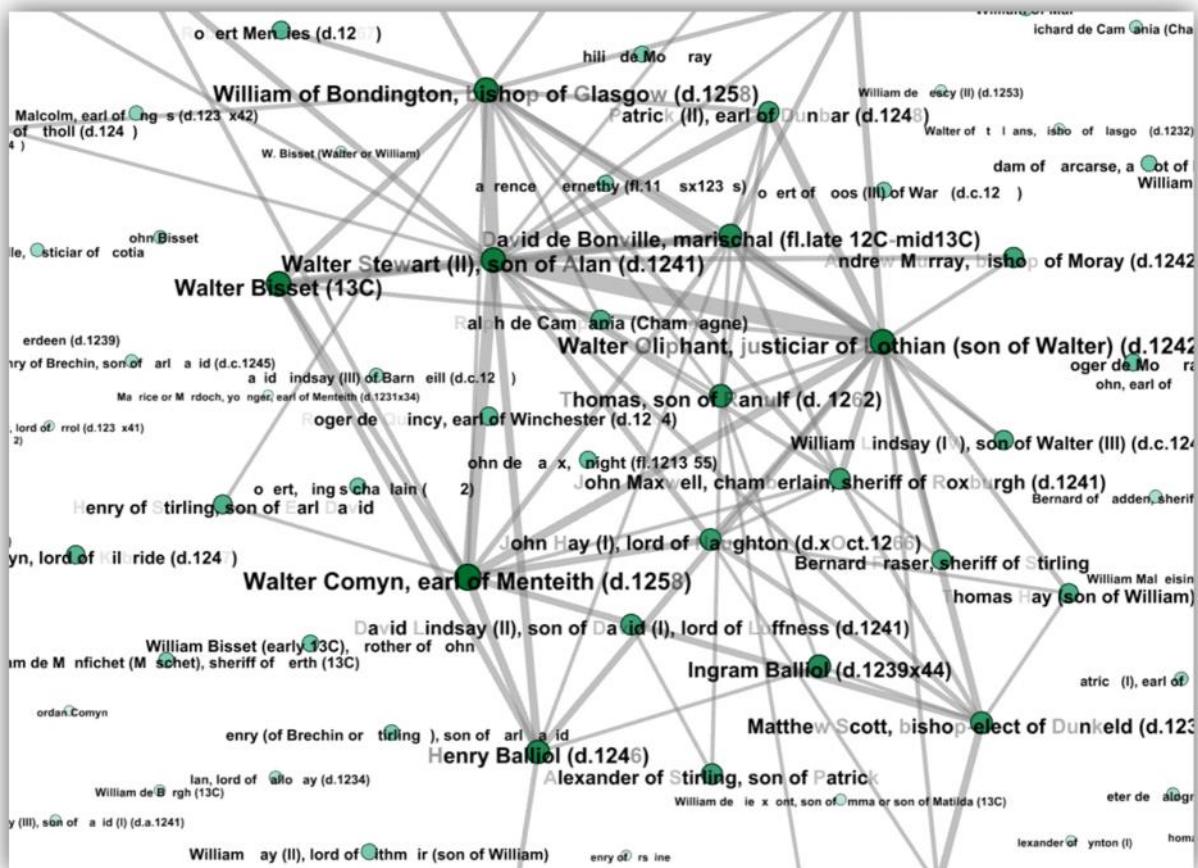
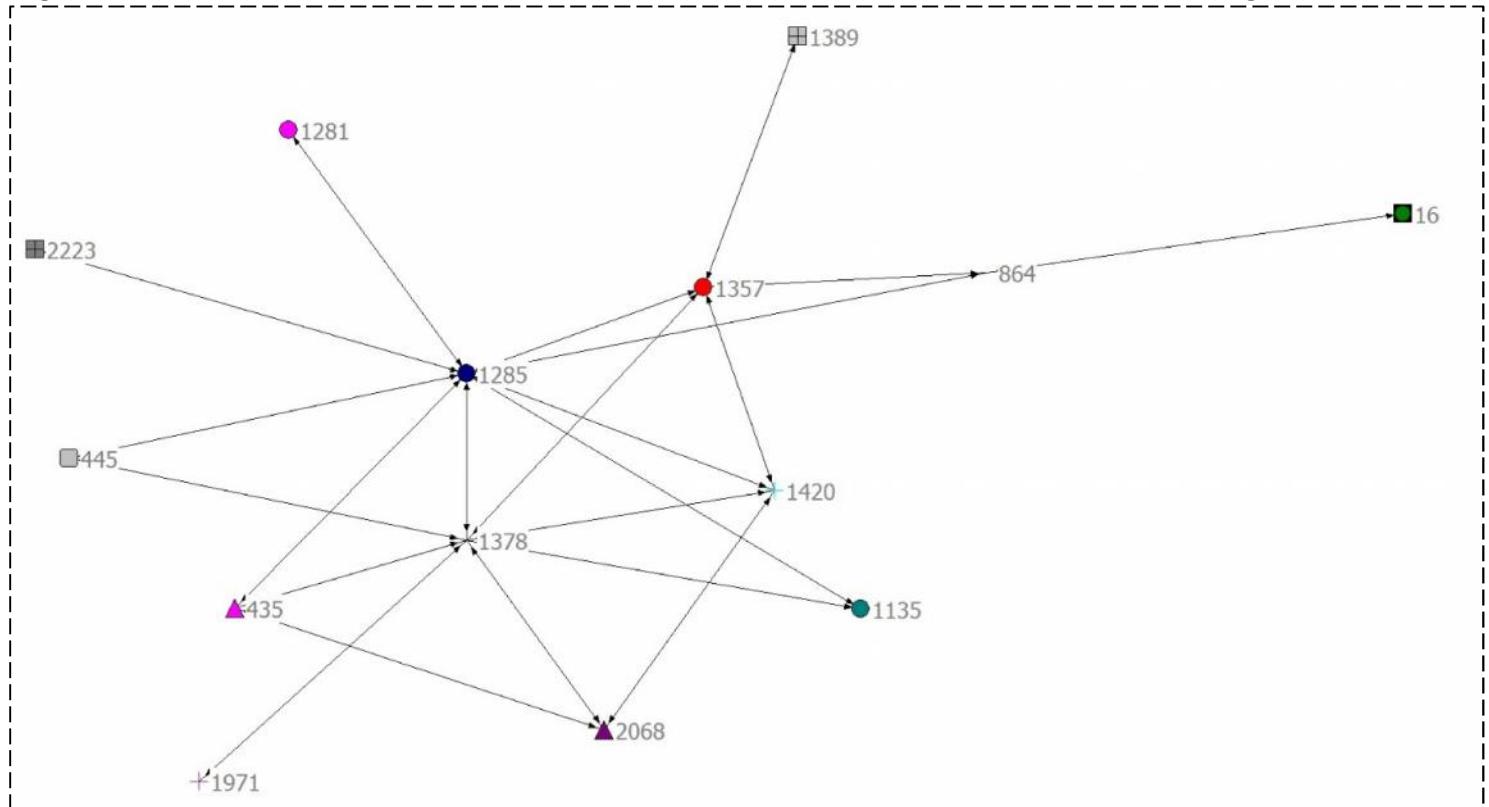


Figure 5.169. Netdraw. Alexander II, time slice 2, more than 10 co-witnessing acts

**KEY:**

<b>1357</b>	Walter Comyn, earl of Menteith (d.1258)
<b>435</b>	William of Bondington, bishop of Glasgow (d.1258)
<b>1285</b>	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)
<b>2068</b>	Walter Bisset (13C)
<b>1378</b>	Walter Stewart (II), son of Alan (d.1241)
<b>1420</b>	Henry Balliol (d.1246)
<b>1135</b>	David de Bonville, marischal (fl.late 12C-mid13C)
<b>864</b>	Matthew Scott, bishop-elect of Dunkeld (d.1230)
<b>1971</b>	Alan Durward (d.1275)
<b>445</b>	Patrick (II), earl of Dunbar (d.1248)
<b>1389</b>	John Hay (I), lord of Naughton (d.xOct.1266)
<b>1281</b>	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)
<b>2223</b>	Roger Avenel, sheriff (d. 1243)
<b>16</b>	William Comyn, earl of Buchan (d.1233)

Figure 5.170. Gephi. Alexander II, time slice 2, more than 10 co-witnessing acts

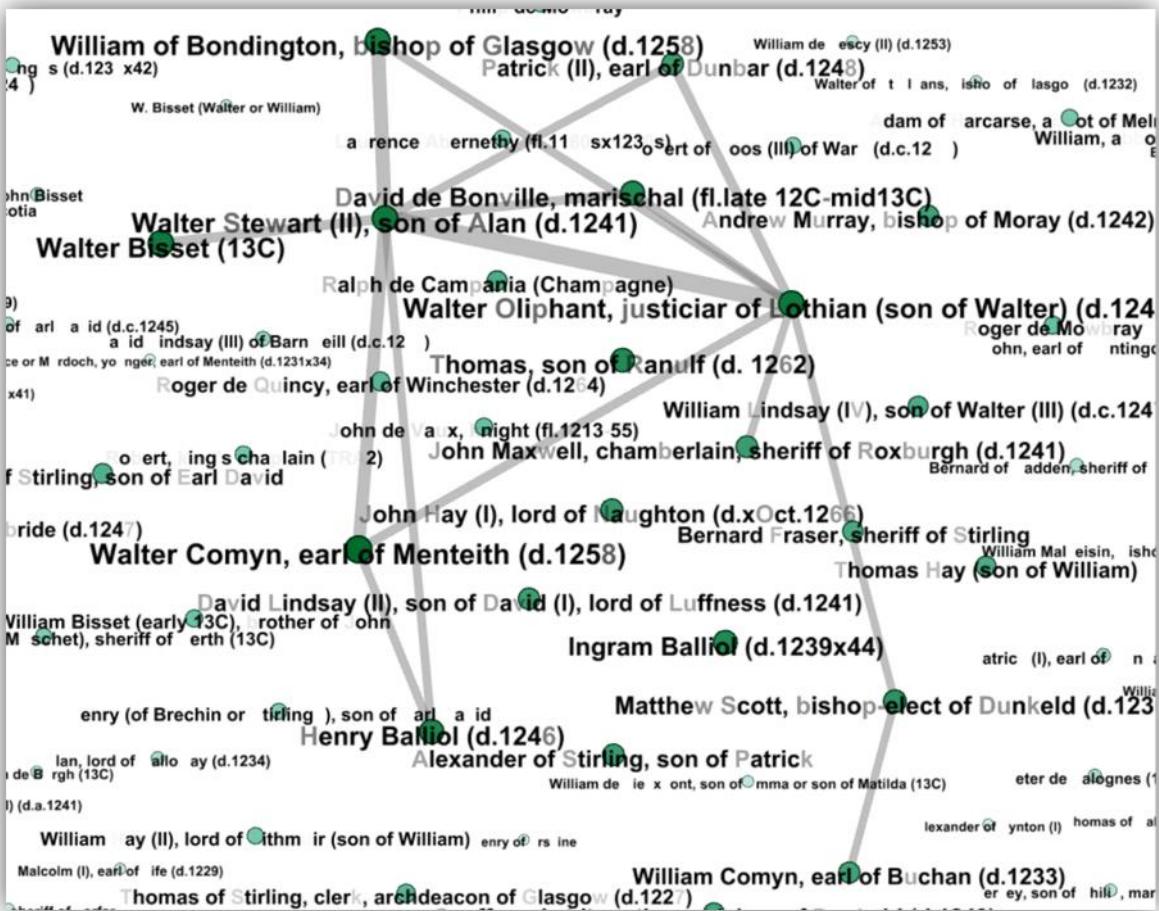


Figure 5.171. Gephi. Walter Comyn, earl of Menteith, connections, >10 level

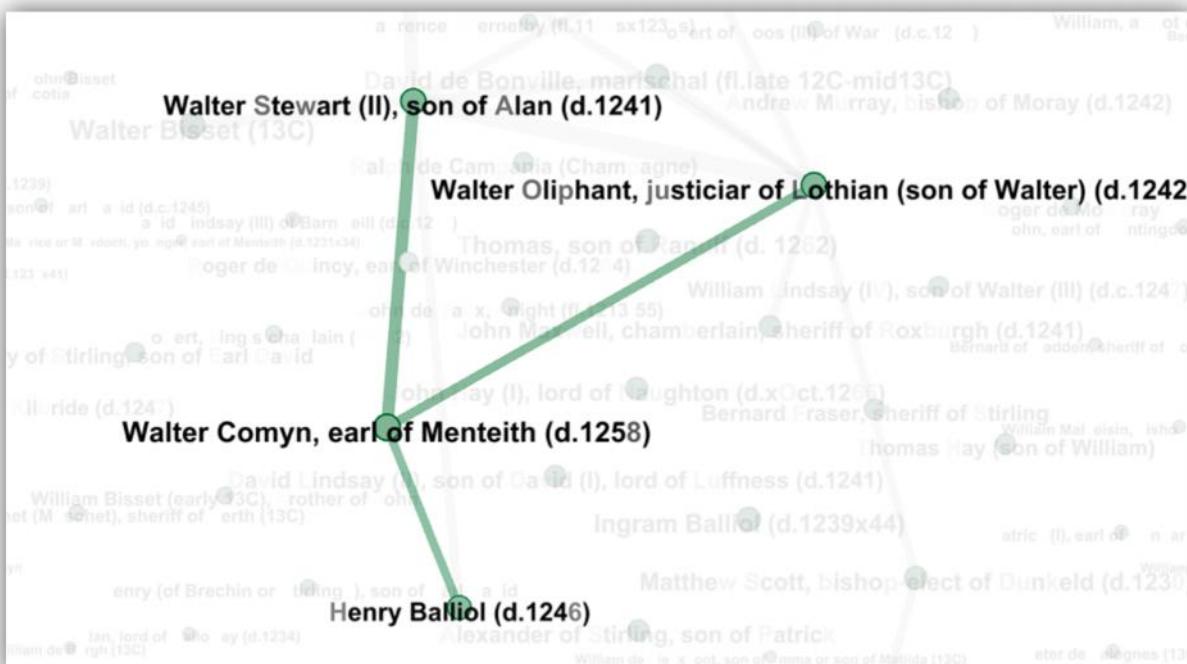


Figure 5.172. Netdraw. Alexander II, time slice 2, more than 12 co-witnessing acts

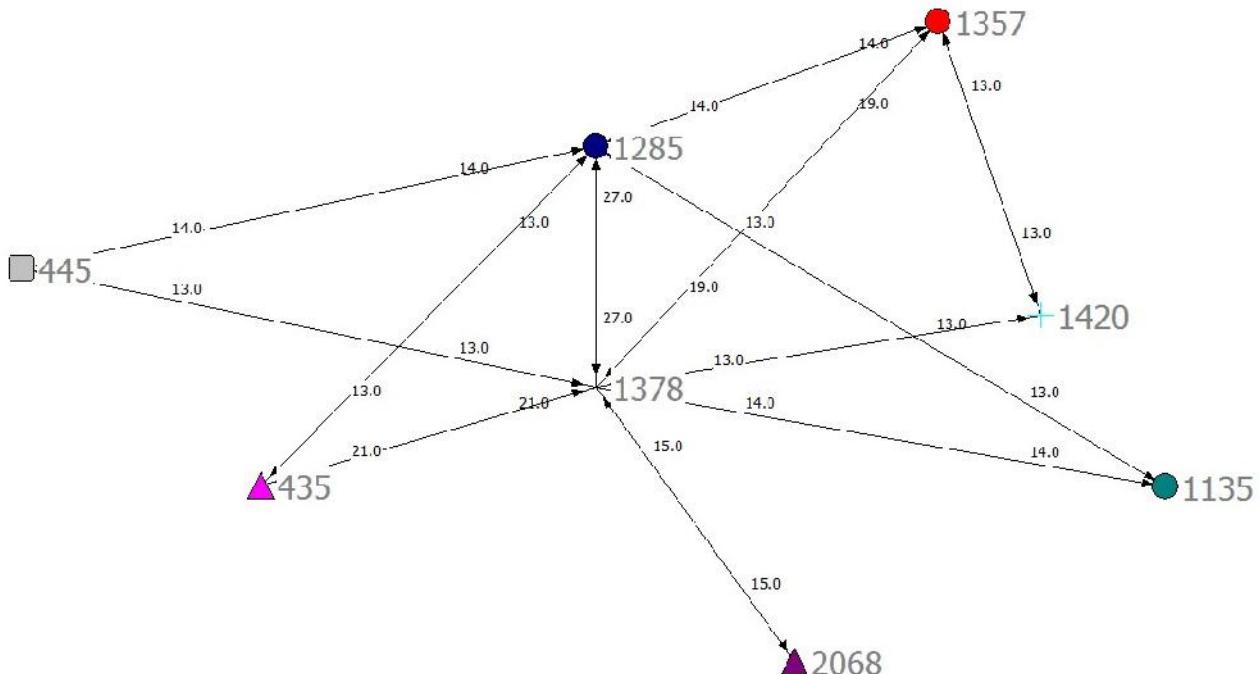


Figure 5.173. Gephi. Alexander II, time slice 2, more than 15 co-witnessing acts

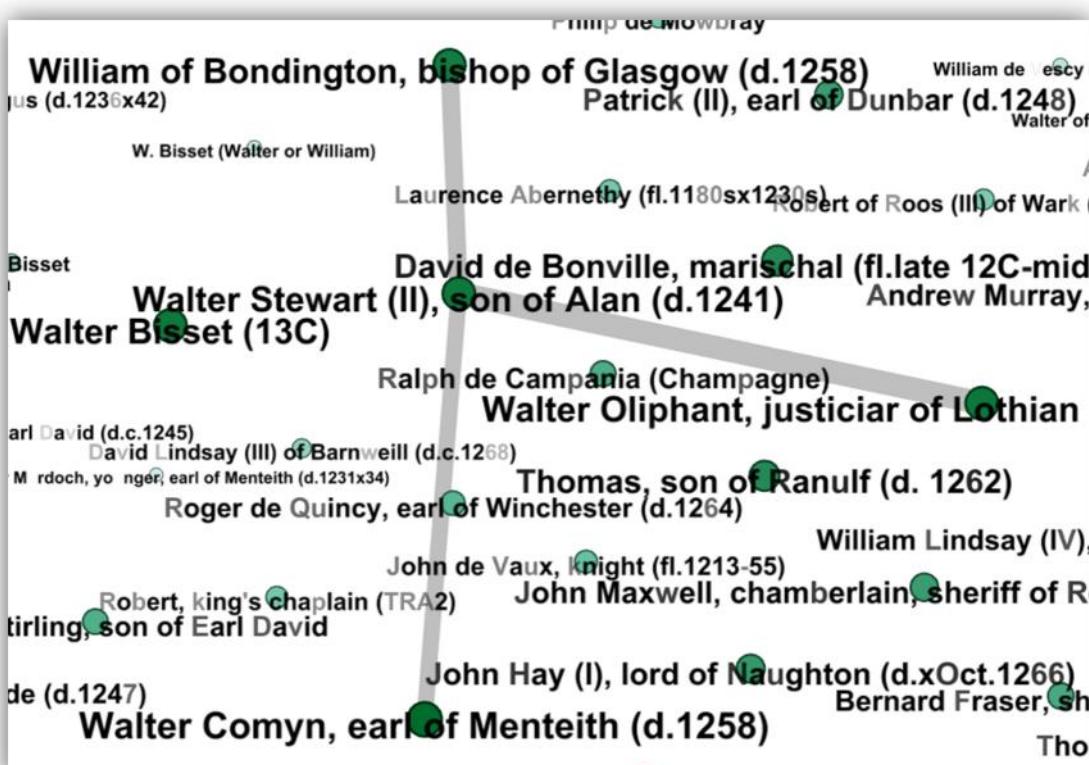
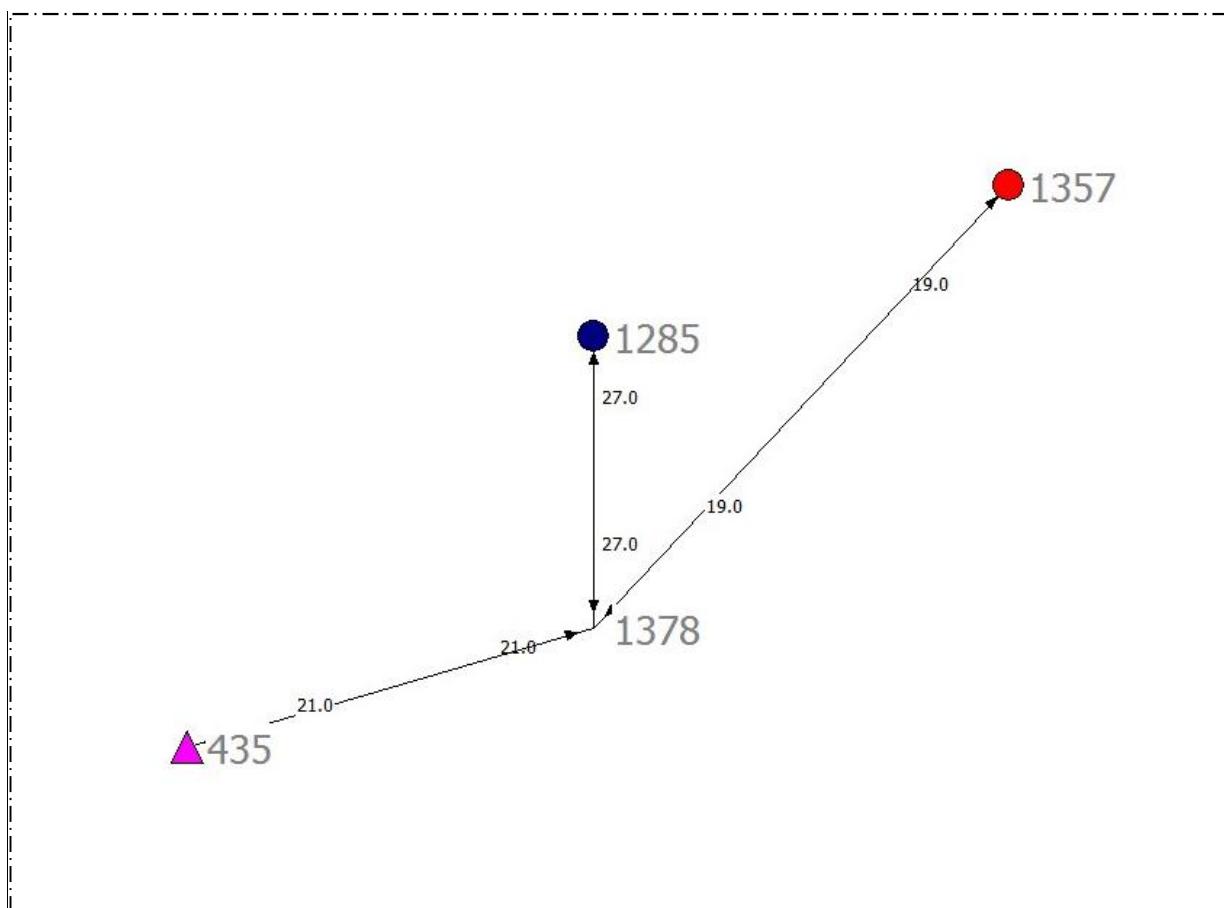


Figure 5.174. Netdraw. Alexander II, time slice 2, more than 18 co-witnessing acts



## ALEXANDER II, TIME SLICE 3 (1236-49)

There are only 68 documents in the final 13 year time slice of Alexander II's reign, out of a potential 75, all of them charters. 63 of these were definitely in the time period, with a further 5 possibly dating to the time period. There were 121 witnesses in the study, all male, with 810 edges. This later period of Alexander II sees the beginning of the transition to the situation in the second half of the thirteenth century, when charters were less important for royal administration for various reasons.

Table 5.64. Top 11 actors by degree (churchmen in italics)

PoMS ID	Name	Degree	Eigenvector	Betweenness
<b>2039</b>	<i>Geoffrey de Liberatione, bishop of Dunkeld (d.1249)</i>	53	0.937379	1398.97
<b>1971</b>	Alan Durward (d.1275)	43	1	436.3719
<b>1357</b>	Walter Comyn, earl of Menteith (d.1258)	41	0.905958	339.5946
<b>2065</b>	Robert Menzies (d.1267)	40	0.819949	430.5764
<b>2041</b>	William, earl of Mar (d.a.1281)	38	0.649768	437.9942
<b>1378</b>	Walter Stewart (II), son of Alan (d.1241)	38	0.833136	321.5729
<b>4406</b>	Bernard of Ripley	37	0.66858	562.2395
<b>1285</b>	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	36	0.853432	166.5163
<b>2110</b>	William of Brechin, knight	34	0.674657	316.7182
<b>445</b>	Patrick (II), earl of Dunbar (d.1248)	34	0.856375	156.3536

Table 5.65. Top 10 actors by eigenvector (churchmen in italics)

PoMS ID	Name	Degree	Eigenvector
<b>1971</b>	Alan Durward (d.1275)	43	1
<b>2039</b>	<i>Geoffrey de Liberatione, bishop of Dunkeld (d.1249)</i>	53	0.937379
<b>1357</b>	Walter Comyn, earl of Menteith (d.1258)	41	0.905958
<b>445</b>	Patrick (II), earl of Dunbar (d.1248)	34	0.856375
<b>1285</b>	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	36	0.853432
<b>4479</b>	Robert of Roos (III) of Wark (d.c.1270)	34	0.839524
<b>1378</b>	Walter Stewart (II), son of Alan (d.1241)	38	0.833136
<b>2065</b>	Robert Menzies (d.1267)	40	0.819949
<b>1982</b>	<i>Clement, bishop of Dunblane (d.1258)</i>	32	0.816115
<b>2068</b>	Walter Bisset (13C)	30	0.763365

We see the continuation of some trends in Alexander II's last time slice. There are fewer clerics than previously among the top ten. A new direction is indicated by the absence of any chancellors or top clerks. While Geoffrey, bishop of Dunkeld, had previously been clerk of the livery, his presence at the top of the degree list and second among eigenvector (at 93%) suggests his political importance at the king's court was due to other factors. Alan Durward, doorward or usher of the king, and husband of an illegitimate daughter of the king, was the most powerful person according to eigenvector. Walter Comyn, earl of Menteith, has a score of 90% compared to Alan. Durward had been briefly earl of Atholl in 1235 and 1236, and was justiciar of Scotia by 1244. Walter Oliphant, justiciar of Lothian until his death in 1242, appears among the top actors, but his successor David Lindsay (II) does not. The appearance of the baron Robert of Roos (III) (aka Robert de Ros) and Earl Patrick (II) of Dunbar could be due to their status as half-brothers of the king.

Table 5.66. Positions held by top actors (churchmen in italics)

Poms ID	Name	Position
2039	<i>Geoffrey de Liberatione, bishop of Dunkeld (d.1249)</i>	Bishop of Dunkeld (1236-49) (former king's clerk)
1971	Alan Durward (d.1275)	Justiciar of Scotia, 1244-51 Doorward, son-in-law of king
1357	Walter Comyn, earl of Menteith (d.1258)	Earl of Menteith; head of Comyns
2065	Robert Menzies (d.1267)	Baron
2041	William, earl of Mar (d.a.1281)	Earl of Mar (ca 1244-1276x81); brother-in-law of Walter Comyn
1378	Walter Stewart (II), son of Alan (d.1241)	Justiciar of Scotia, 1232-41
4406	Bernard of Ripley	Knight
1285	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	Justiciar of Lothian, - 1242
2110	William of Brechin, knight	Knight
445	Patrick (II), earl of Dunbar (d.1248)	Earl of Dunbar, half-brother of king
4479	Robert of Roos (III) of Wark (d.c.1270)	Baron, half-brother of king
1982	<i>Clement, bishop of Dunblane (d.1258)</i>	Bishop of Dunblane, 1233-58

The trend of top actors witnessing fewer of the royal acta from the period also continues in Alexander II T3. Walter Comyn, earl of Menteith, the most active witness in the period, barely witnessed more than a quarter of the documents. Alan Durward, the top man by eigenvector, witnessed a paltry 13 documents, or 19% of the total.

Table 5.67. Documents witnessed by top actors (churchmen in italics)

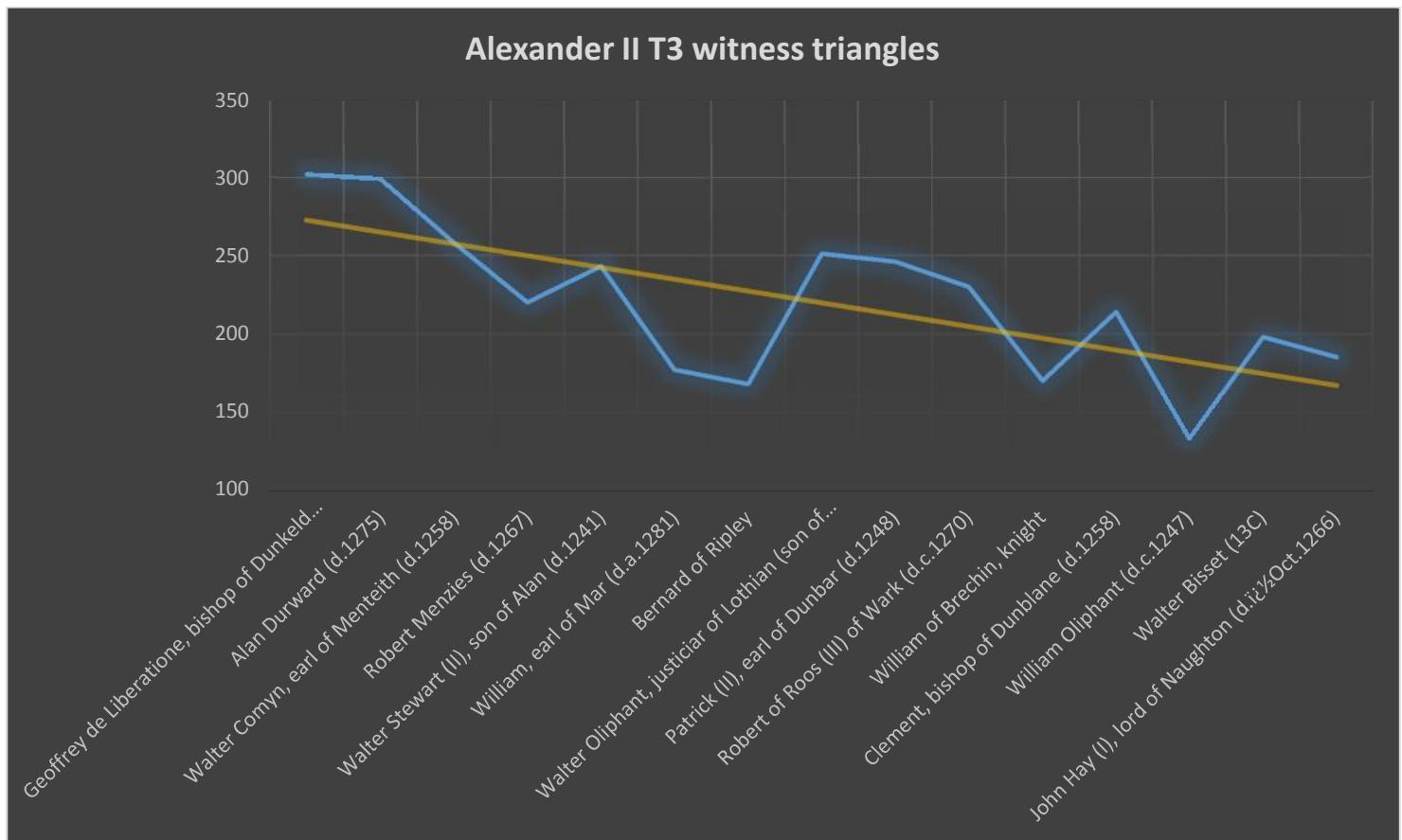
ID	Person	#AT3 docs witnessed	% AT3 docs witnessed	Docs/ year (13 years)	Degree/ docs witnessed
<b>2039</b>	<i>Geoffrey de Liberatione, bishop of Dunkeld (d.1249)</i>	13	19.1%	1	4.08
<b>1971</b>	Alan Durward (d.1275)	13	19.1%	1	3.31
<b>1357</b>	Walter Comyn, earl of Menteith (d.1258)	18	26.5%	1.38	2.28
<b>2065</b>	Robert Menzies (d.1267)	14	20.6%	1.08	2.86
<b>2041</b>	William, earl of Mar (d.a.1281)	14	20.6%	1.08	2.71
<b>1378</b>	Walter Stewart (II), son of Alan (d.1241)	15	22.1%	1.15	2.53
<b>4406</b>	Bernard of Ripley	11	16.2%	0.85	3.36
<b>1285</b>	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	13	19.1%	1	2.77
<b>2110</b>	William of Brechin, knight	7	10.3%	0.54	4.86
<b>445</b>	Patrick (II), earl of Dunbar (d.1248)	8	11.8%	0.62	4.25

Table 5.68. Numbers of documents (SD) witnessed (9 or more)

PoMS ID	Names	Docs witnessed
<b>1357</b>	Walter Comyn, earl of Menteith (d.1258)	18
<b>1378</b>	Walter Stewart (II), son of Alan (d.1241)	15
<b>2041</b>	William, earl of Mar (d.a.1281)	14
<b>2065</b>	Robert Menzies (d.1267)	14
<b>1971</b>	Alan Durward (d.1275)	13
<b>1285</b>	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	13
<b>2039</b>	Geoffrey de Liberatione, bishop of Dunkeld (d.1249)	13
<b>4406</b>	Bernard of Ripley	11
<b>1420</b>	Henry Balliol (d.1246)	9

The analysis of triangles for the top 15 actors by degree reveals a more erratic pattern than previous time slices. Geoffrey, bishop of Dunkeld, and Alan Durward both have more triangles than the trendline would suggest, while William, earl of Mar, and Walter Bisset are both well below it.

Figure 5.175. Alexander II T3 witness triangles (top 15 by degree)



The most productive pairs of co-witnesses involve three Walters: Stewart, Oliphant, and Comyn. The numbers of documents co-witnessed are also much lower in this time period, with the most productive relationship rendering only 10 co-witnessing acts. Alan Durward and his political ally Walter Bisset were involved in the relationships on the level of 5 to 7 instances.

Table 5.69. Pairs who witnessed together 5 or more times

Person 1	Person 2	# Docs
Walter Stewart (II), son of Alan (d.1241)	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	10
Walter Comyn, earl of Menteith (d.1258)	Walter Stewart (II), son of Alan (d.1241)	8
Walter Comyn, earl of Menteith (d.1258)	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	8
Walter Comyn, earl of Menteith (d.1258)	Geoffrey de Liberatione, bishop of Dunkeld (d.1249)	8
Alan Durward (d.1275)	Walter Comyn, earl of Menteith (d.1258)	7
Walter Bisset (13C)	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	6
Alan Durward (d.1275)	Walter Bisset (13C)	5
Alan Durward (d.1275)	Walter Stewart (II), son of Alan (d.1241)	5
Alan Durward (d.1275)	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	5
Walter Bisset (13C)	Walter Stewart (II), son of Alan (d.1241)	5
Alexander Comyn, earl of Buchan (d.1289)	William, earl of Mar (d.a.1281)	5
Henry Balliol (d.1246)	Walter Comyn, earl of Menteith (d.1258)	5
Henry Balliol (d.1246)	Geoffrey de Liberatione, bishop of Dunkeld (d.1249)	5
Patrick (II), earl of Dunbar (d.1248)	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	5

Figure 5.176. Netdraw. Witnesses to Alexander II Time Slice 3

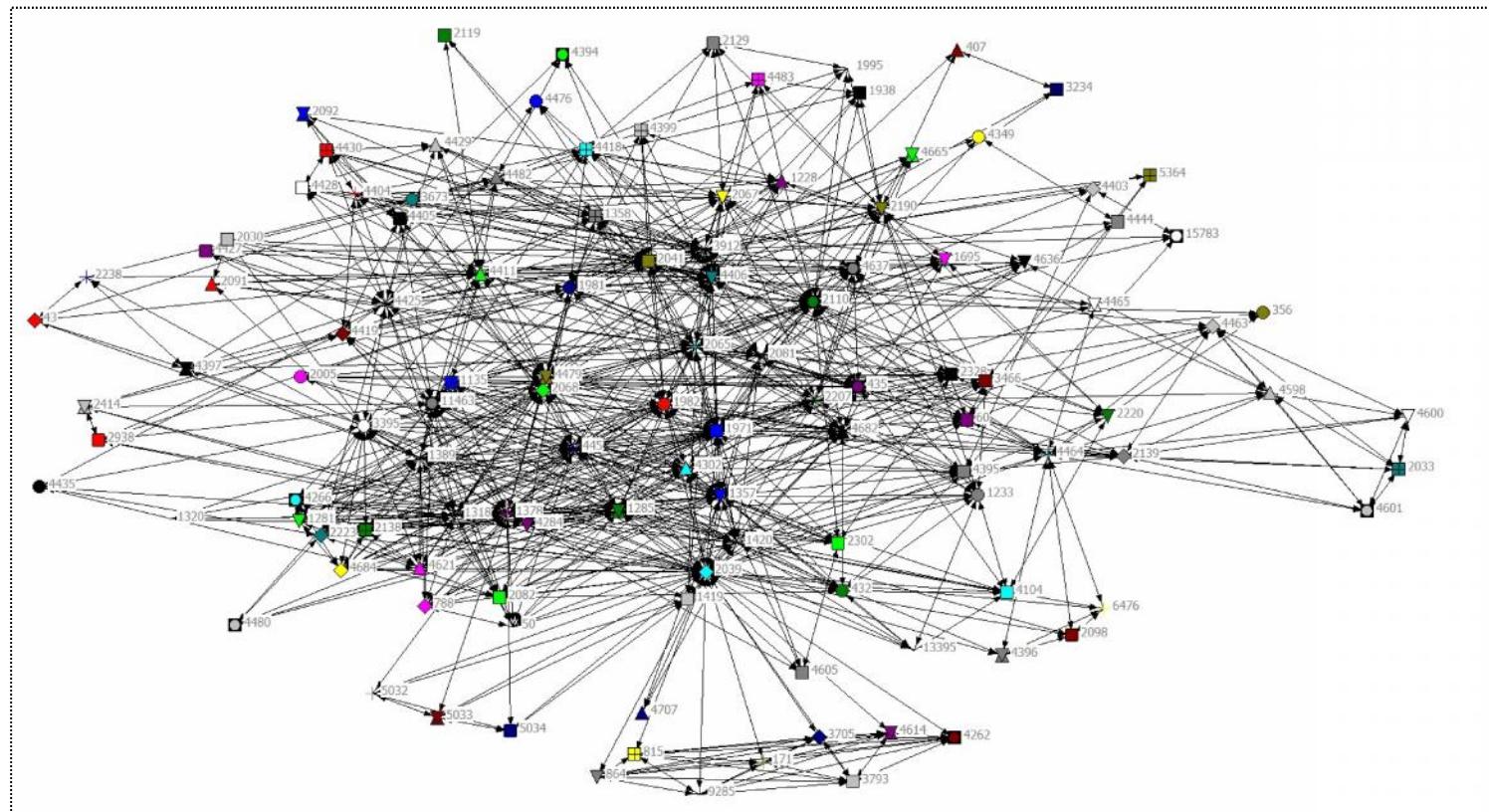


Figure 5.177. Gephi. Connections of Walter Comyn, earl of Menteith

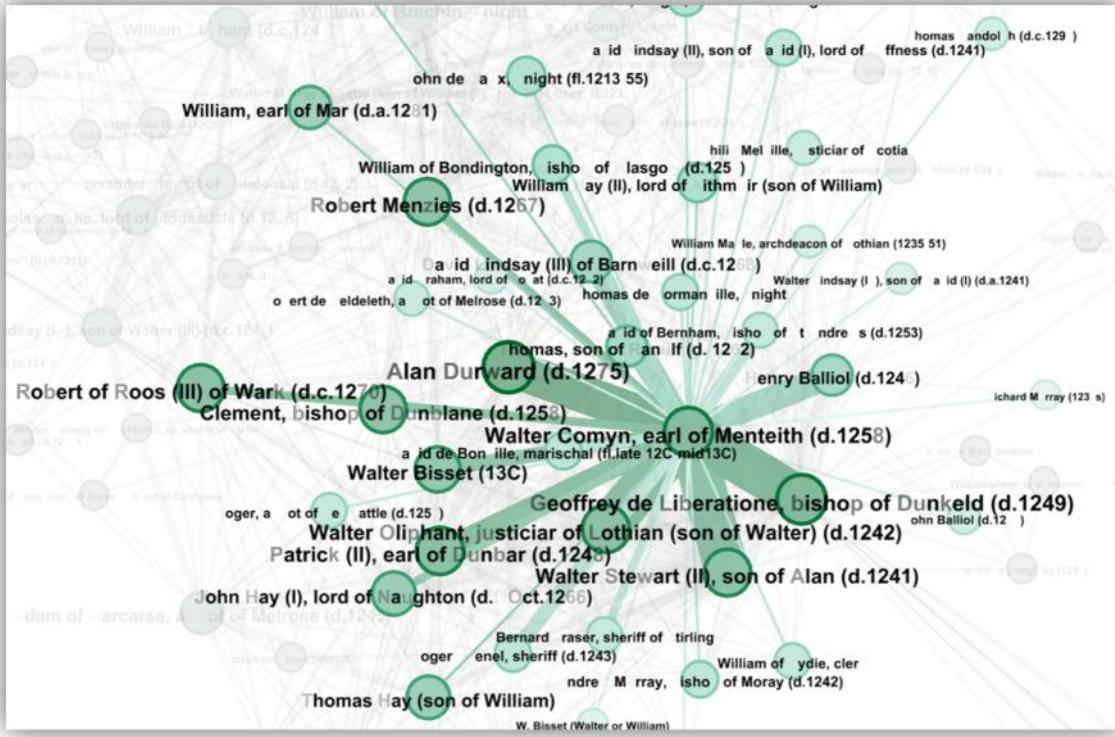
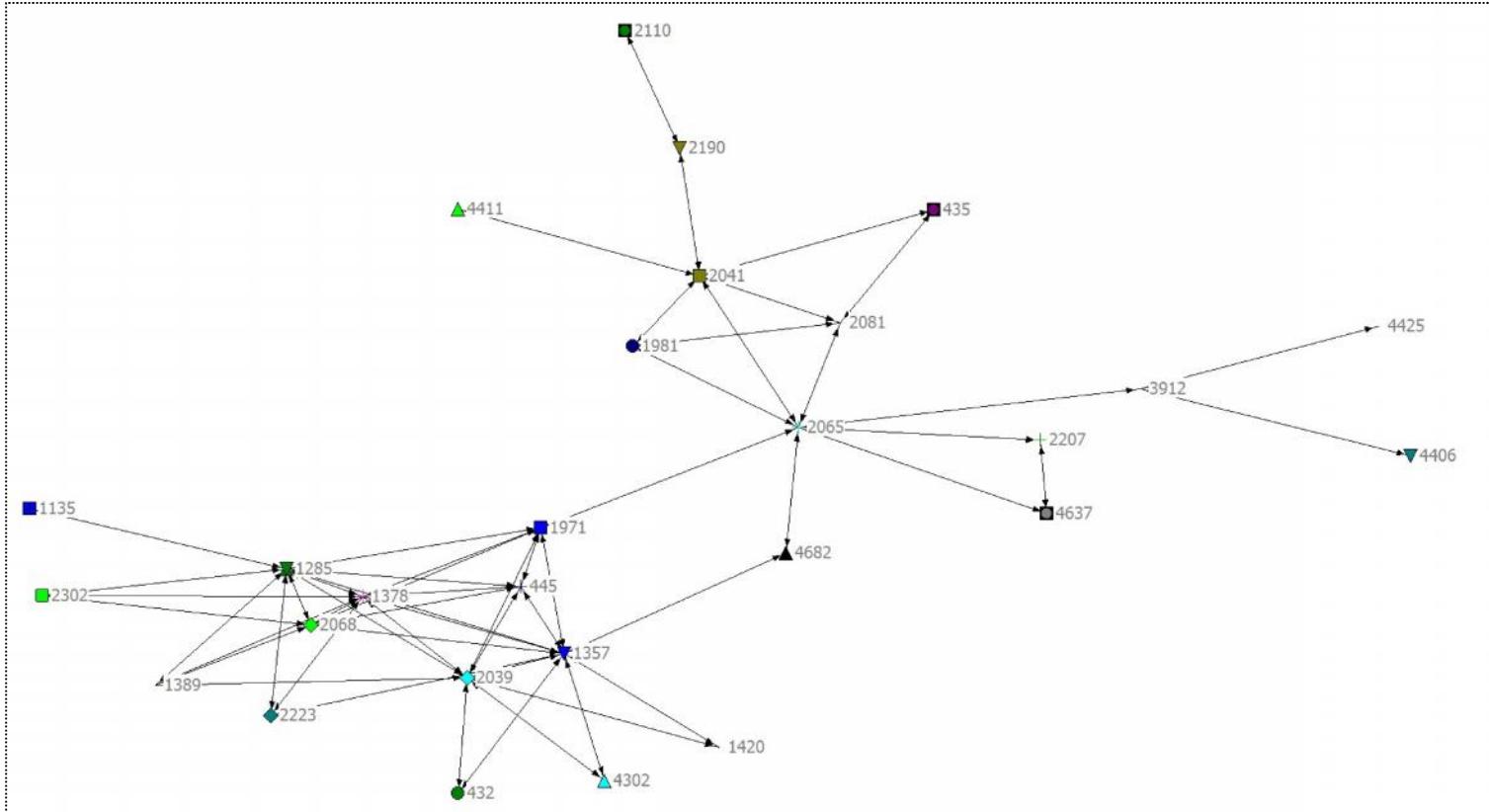


Figure 5.178. Netdraw. Alexander II, T3, more than 2 co-witnessing instances



## KEY:

<b>4425</b>	William Lindsay (IV), son of Walter (III) (d.c.1247)
<b>4406</b>	Bernard of Ripley
<b>3912</b>	William Oliphant (d.c.1247)
<b>2207</b>	Robert Bisset, knight, lord of Upsettlington
<b>4637</b>	Robert Comyn, knight
<b>2065</b>	Robert Menzies (d.1267)
<b>2081</b>	John de Vaux, knight (fl.1213-55)
<b>435</b>	William of Bondington, bishop of Glasgow (d.1258)
<b>1357</b>	Walter Comyn, earl of Menteith (d.1258)
<b>2110</b>	William of Brechin, knight
<b>2190</b>	Robert Mowat, knight, justiciar, sheriff of Forfar
<b>2041</b>	William, earl of Mar (d.a.1281)
<b>1981</b>	Alexander Comyn, earl of Buchan (d.1289)
<b>4411</b>	Nicholas Soulis, lord of Liddesdale (d.1265)
<b>4682</b>	David Lindsay (III) of Barnweill (d.c.1268)
<b>1971</b>	Alan Durward (d.1275)
<b>1357</b>	Walter Comyn, earl of Menteith (d.1258)
<b>445</b>	Patrick (II), earl of Dunbar (d.1248)
<b>1420</b>	Henry Balliol (d.1246)
<b>1285</b>	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)
<b>2068</b>	Walter Bisset (13C)
<b>1378</b>	Walter Stewart (II), son of Alan (d.1241)
<b>4302</b>	Thomas, son of Ranulf (d. 1262)
<b>432</b>	David of Bernham, bishop of St Andrews (d.1253)
<b>2039</b>	Geoffrey de Liberatione, bishop of Dunkeld (d.1249)
<b>2302</b>	Bernard Fraser, sheriff of Stirling
<b>1135</b>	David de Bonville, marischal (fl.late 12C-mid13C)
<b>445</b>	Patrick (II), earl of Dunbar (d.1248)
<b>1389</b>	John Hay (I), lord of Naughton (d.xOct.1266)
<b>2223</b>	Roger Avenel, sheriff (d. 1243)

At the level of more than 2 co-witnessing instances we see two almost separate segments, with [1971] Alan Durward, [1357] Walter Comyn, and [2065] Robert Menzies acting as focal points. One of these is an interesting four-person clique involving [1981] Alexander Comyn, earl of Buchan, [2041] William, earl of Mar (d.a.1281), [2081] John de Vaux, and Robert Menzies. At the level of more than 3 co-witnessing instances (Figure 5.180), the younger generation, represented by Alexander Comyn and William earl of Mar, have separated from the main group.

Figure 5.179. Gephi. Alan Durward connections, more than 2 level

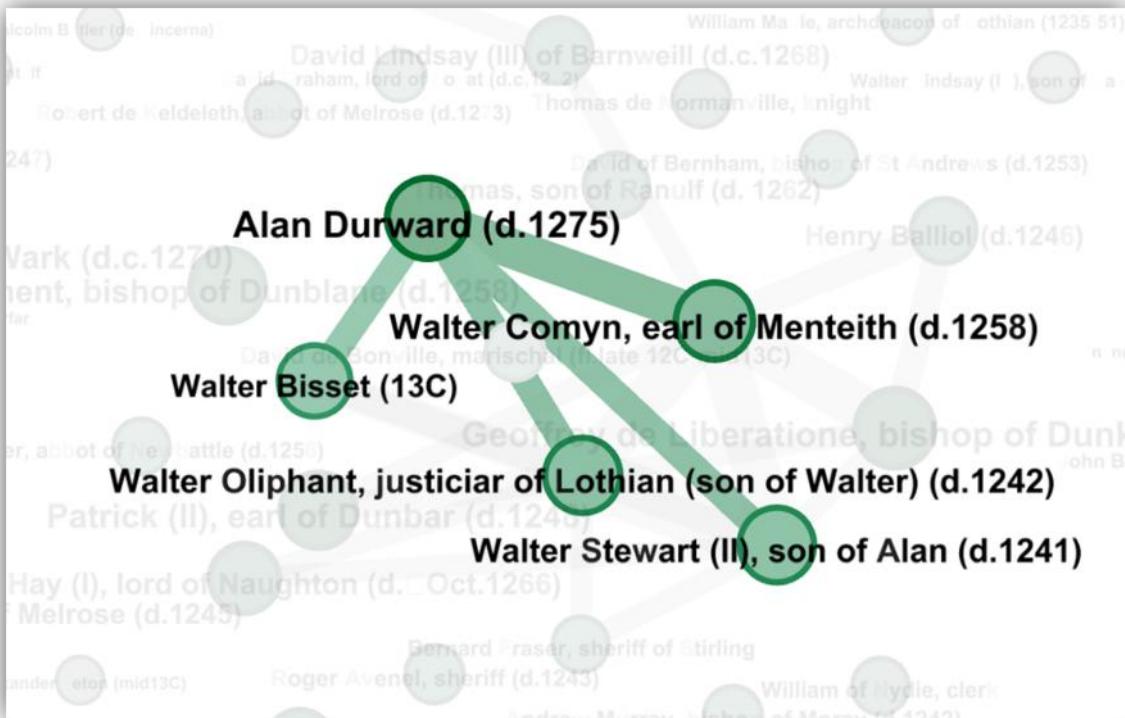


Figure 5.180. Gephi. Alexander II T3, more than 3 co-witnessing instances

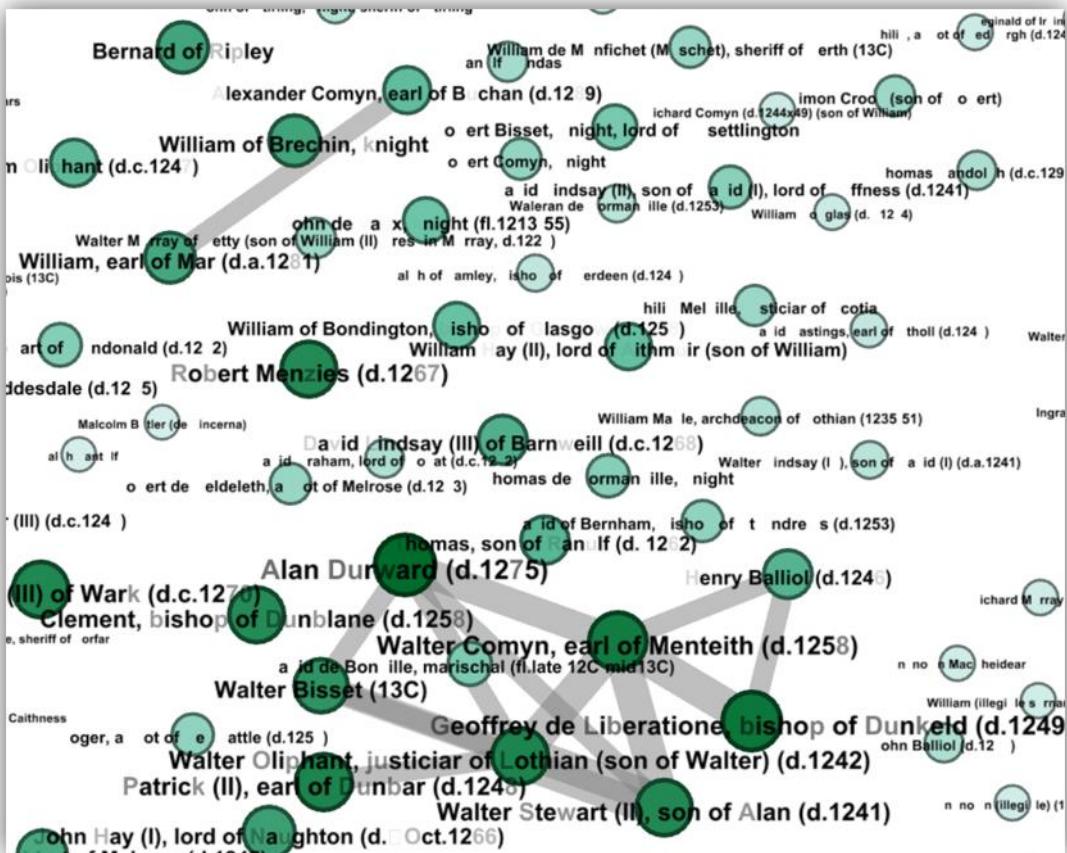


Figure 5.181. Gephi. Alexander II T3, more than 3, detail

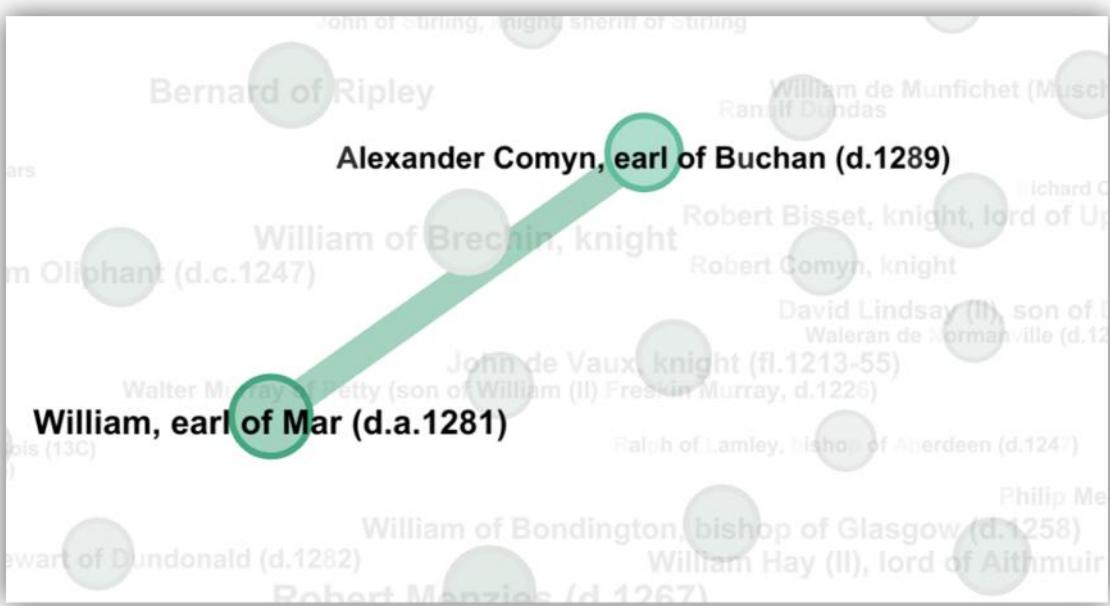


Figure 5.182. Gephi. Alexander II T3, more than 5 co-witnessing acts

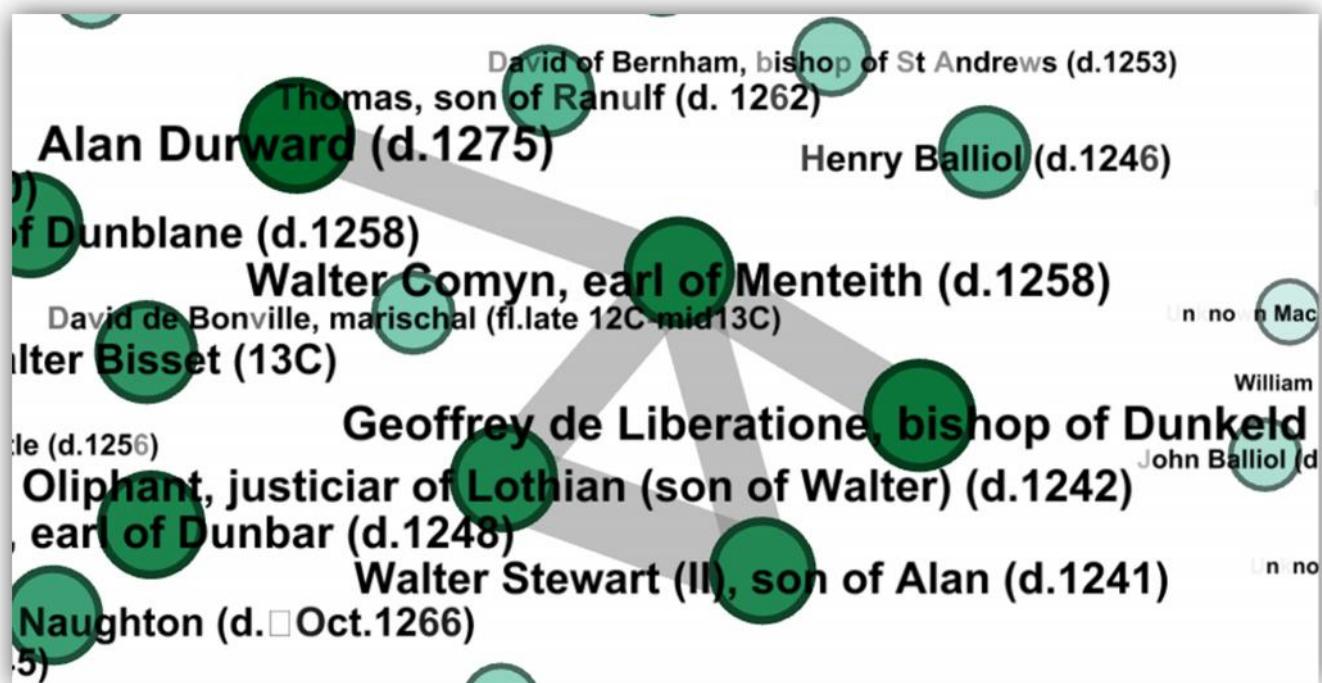


Figure 5.183. Netdraw. Alexander II, T3, more than 4 co-witnessing instances

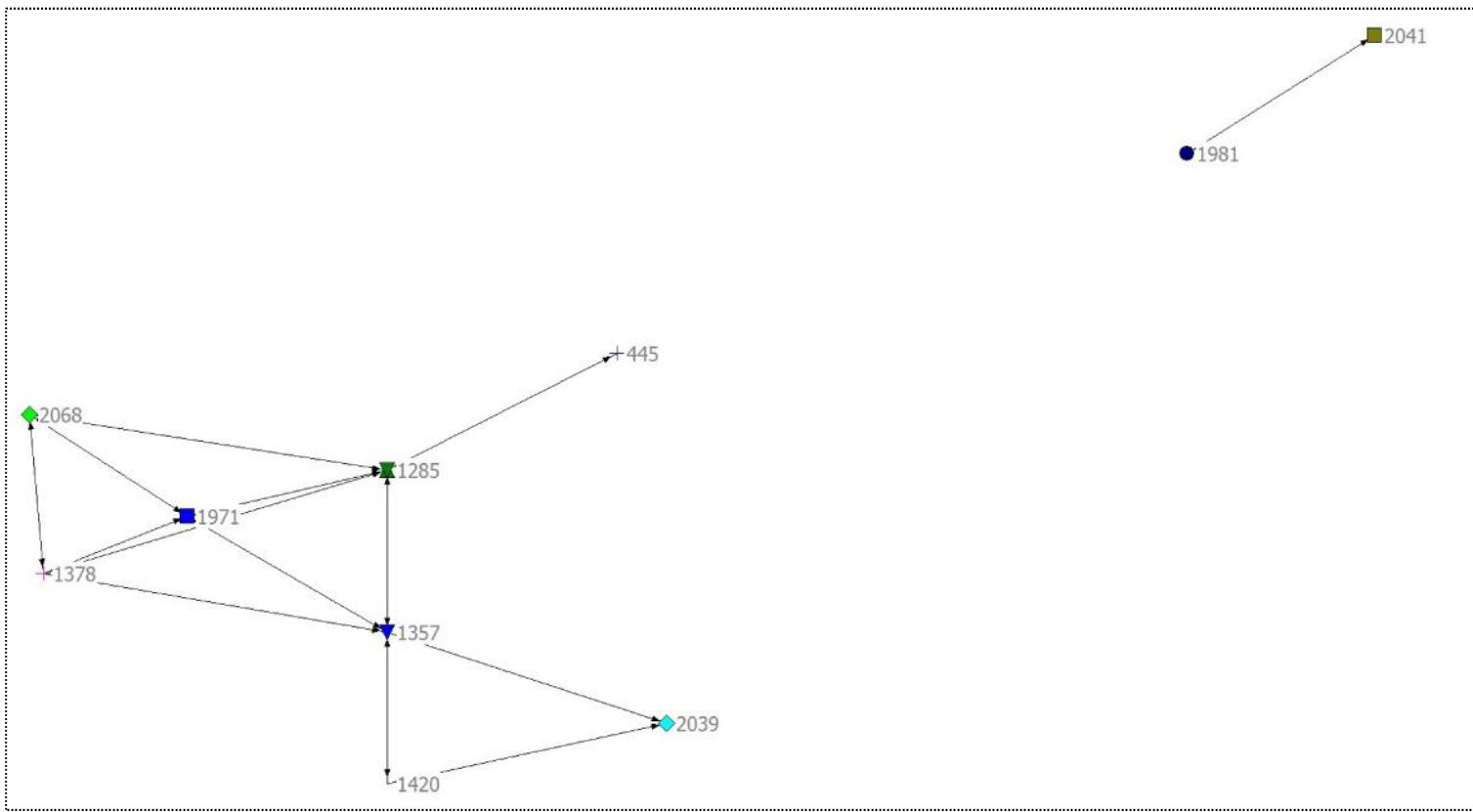


Figure 5.184. Netdraw. Alexander II, T3, more than 5 co-witnessing instances

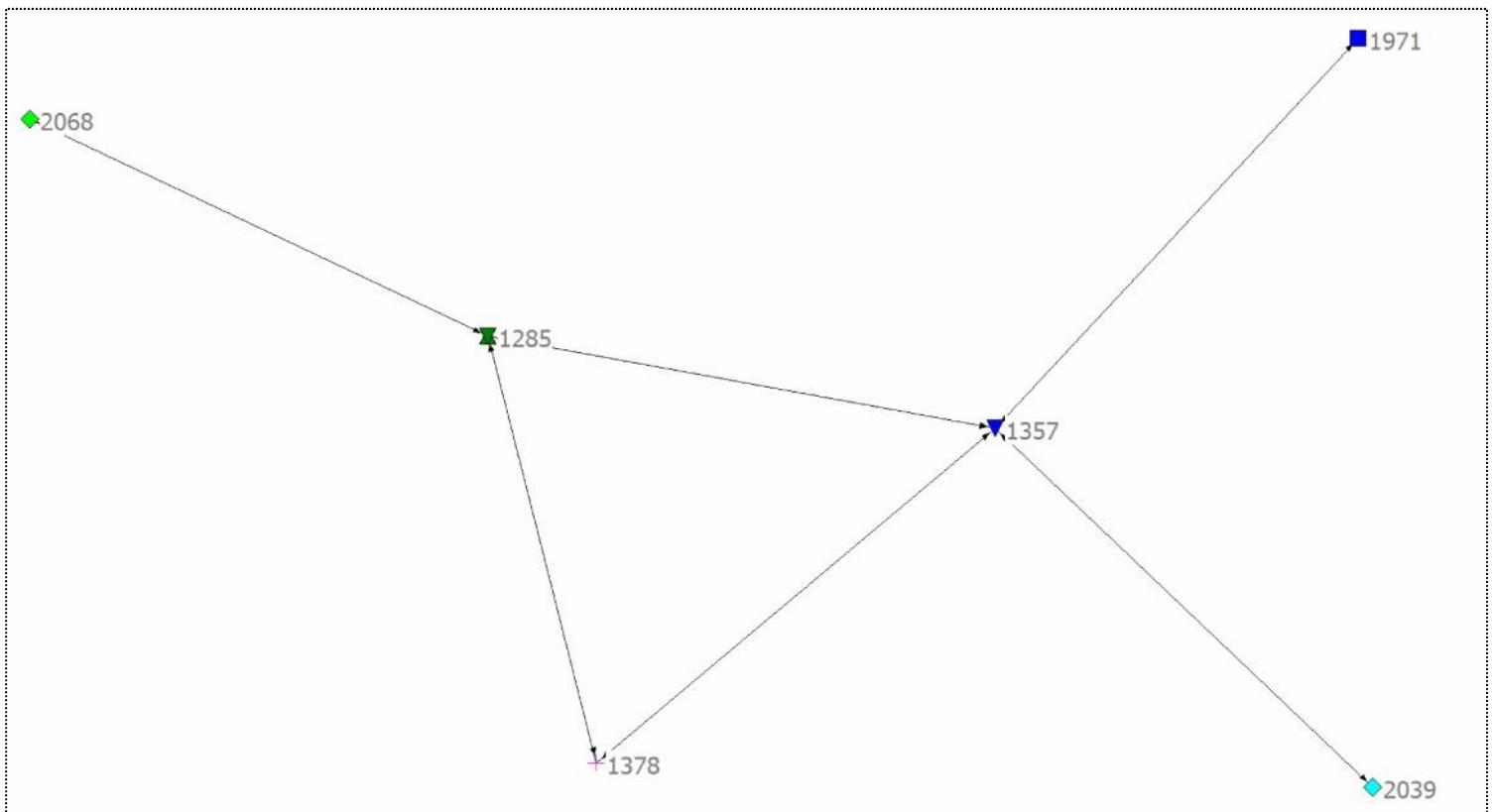


Figure 5.185. Netdraw. Alexander II, T3, more than 7 co-witnessing instances

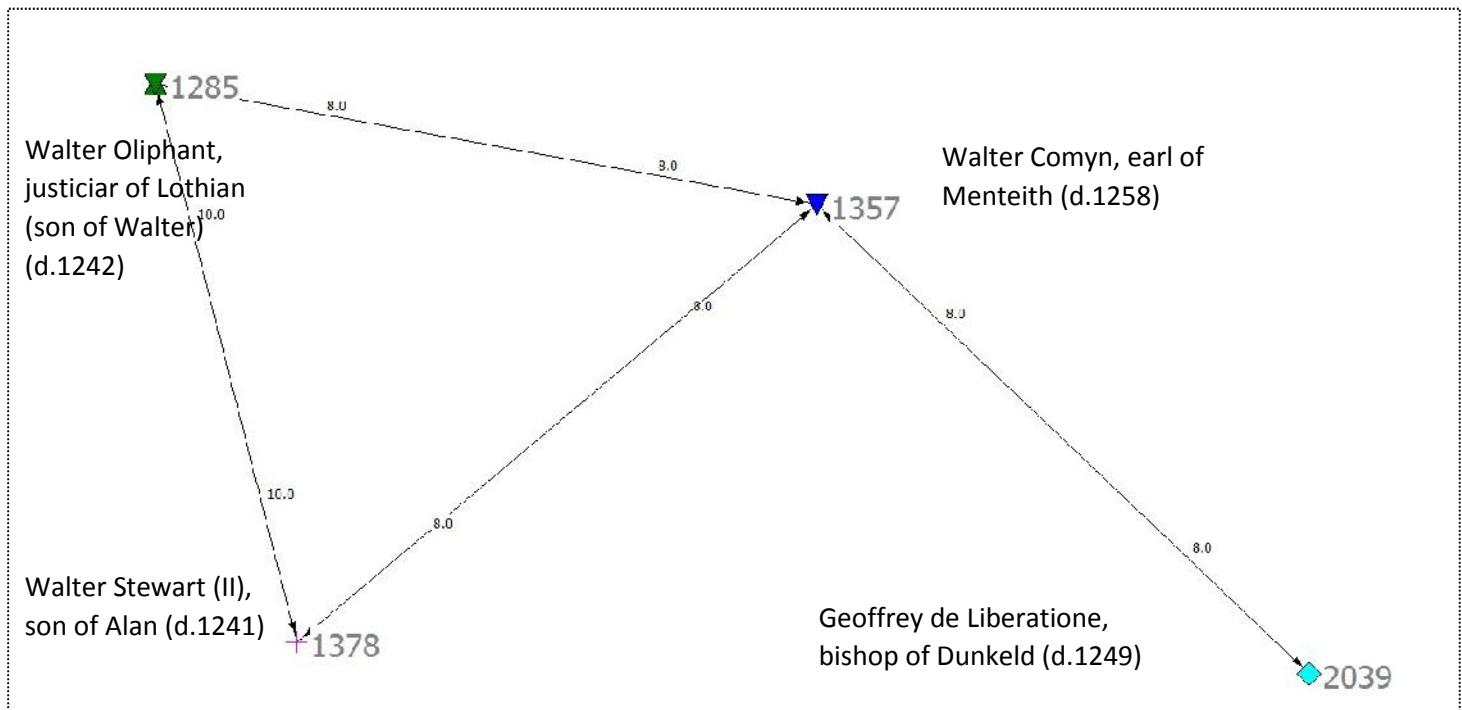
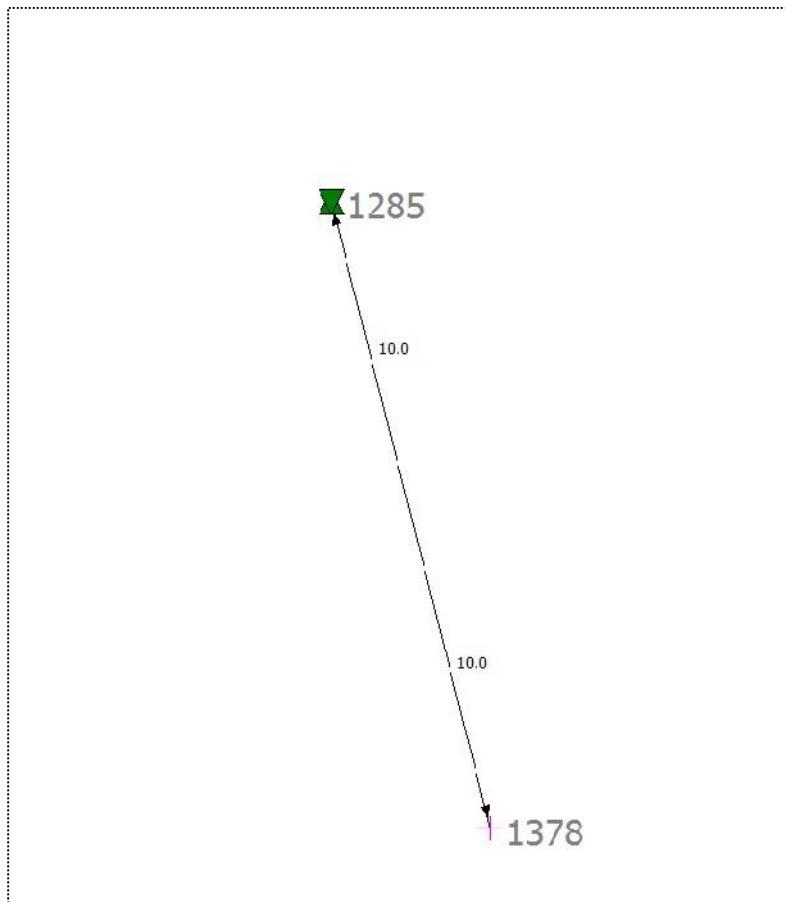


Figure 5.186. Netdraw. Alexander II, T3, more than 8 co-witnessing instances



## TIME SLICE COMPARISON

This final section will consider how comparable are the various reigns and time slices. There is a certain amount of variation between each reign and/or time slice as regards length of time, number of documents, and number of witnesses. There are not sufficient numbers of documents in the 29-year reign of David I and the 37-year reign of Alexander III to allow very effective comparison with the other periods. The reign of Malcolm and the six time slices reduce the degree of variation, however. The variation in length of time is between 11 and 19 years, in documents it is between 68 documents and 405, or between 5.23 documents per year and 11.18 documents per year. In witnesses it varies between 121 and 198 people. What follows will attempt to add texture to these comparisons.

Table 5.70 Reigns and Time Slices

King	Time period	Length*	Documents	Docs/year	Witnesses
David I	1124-1153	29	83	2.86	172
Malcolm IV	1153-1165	12	88	7.33	157
William I	1165-1241	49	405	8.27	394
William I (T1)	1165-1178	13	128 [120+8]	[9.85]	184
William I (T2)	1178-1195	17	156 [130+26]	[9.18]	198
William I (T3)	1195-1214	19	134 [127+7]	[7.05]	184
Alexander II	1214-1249	35	277	7.91	286
Alexander II (T1)	1214-1225	11	107 [89+5]	[9.72]	122
Alexander II (T2)	1225-1236	11	123 [117+6]	[11.18]	170
Alexander II (T3)	1236-1249	13	68 [63+5]	[5.23]	121
Alexander III	1249-1286	37	67	1.81	130

\*Lengths of reigns have been rounded

Figure 5.188 shows the average number of documents per year per reign. We see that the production (and survival rate) of royal charters, charter/brieves, notifications and settlements was fairly steady for the reigns of Malcolm, William, and Alexander II.

## A. Numbers of years, documents, and witnesses

Figure 5.187. Lengths of reigns and time slices

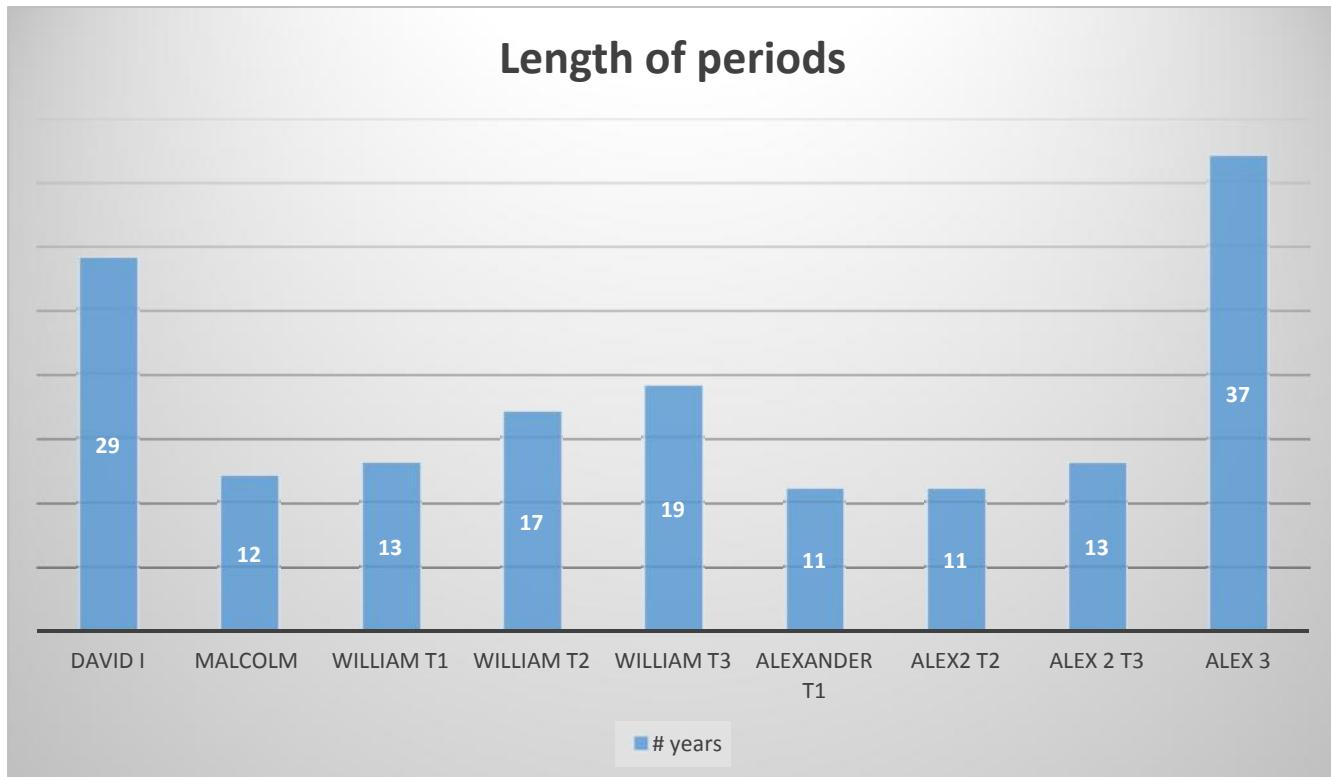


Figure 5.188. Average numbers of documents per year by reign

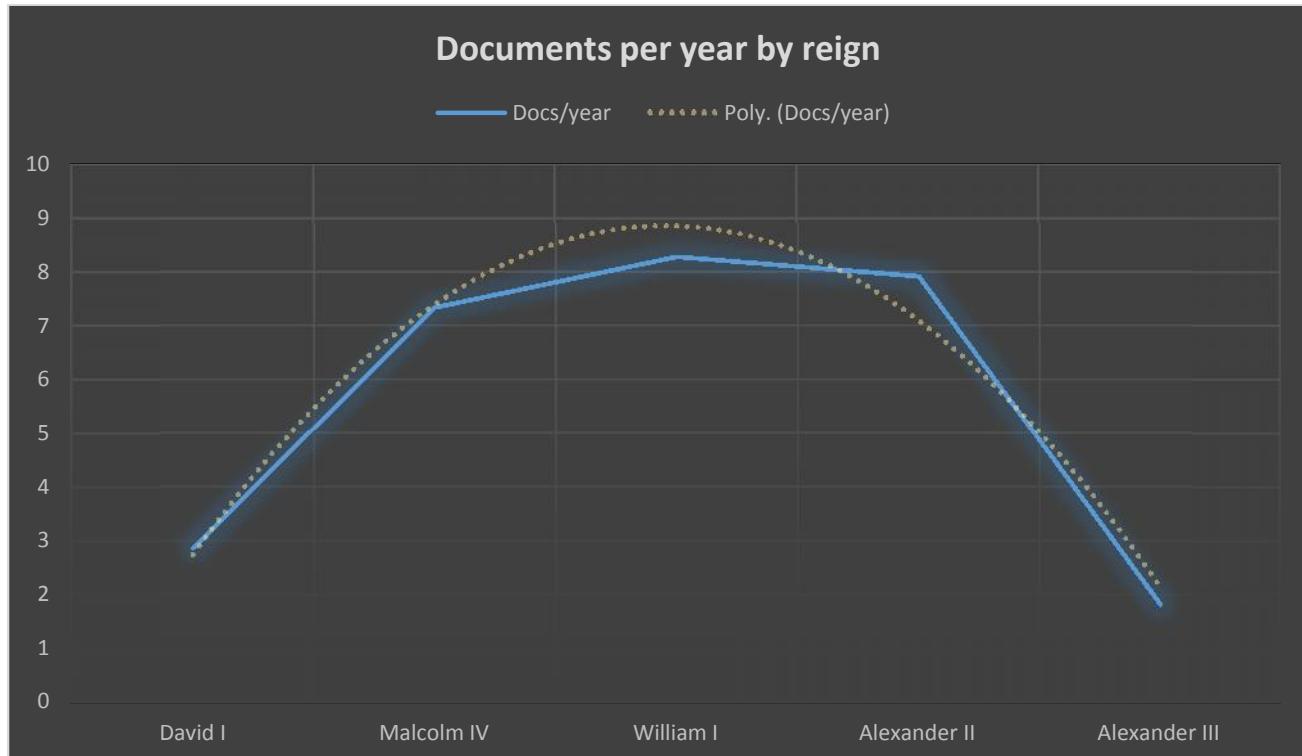


Figure 5.189. Comparison of numbers of documents and witnesses

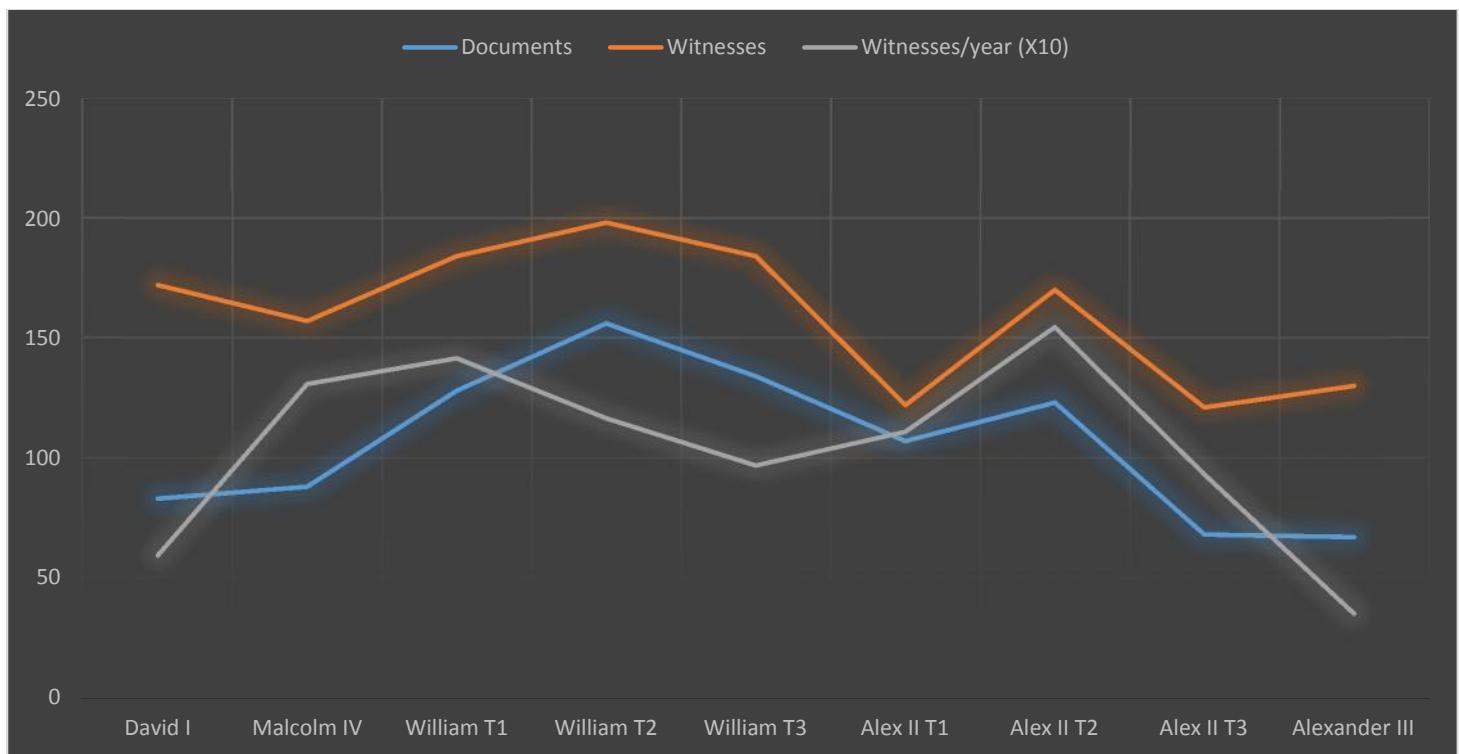
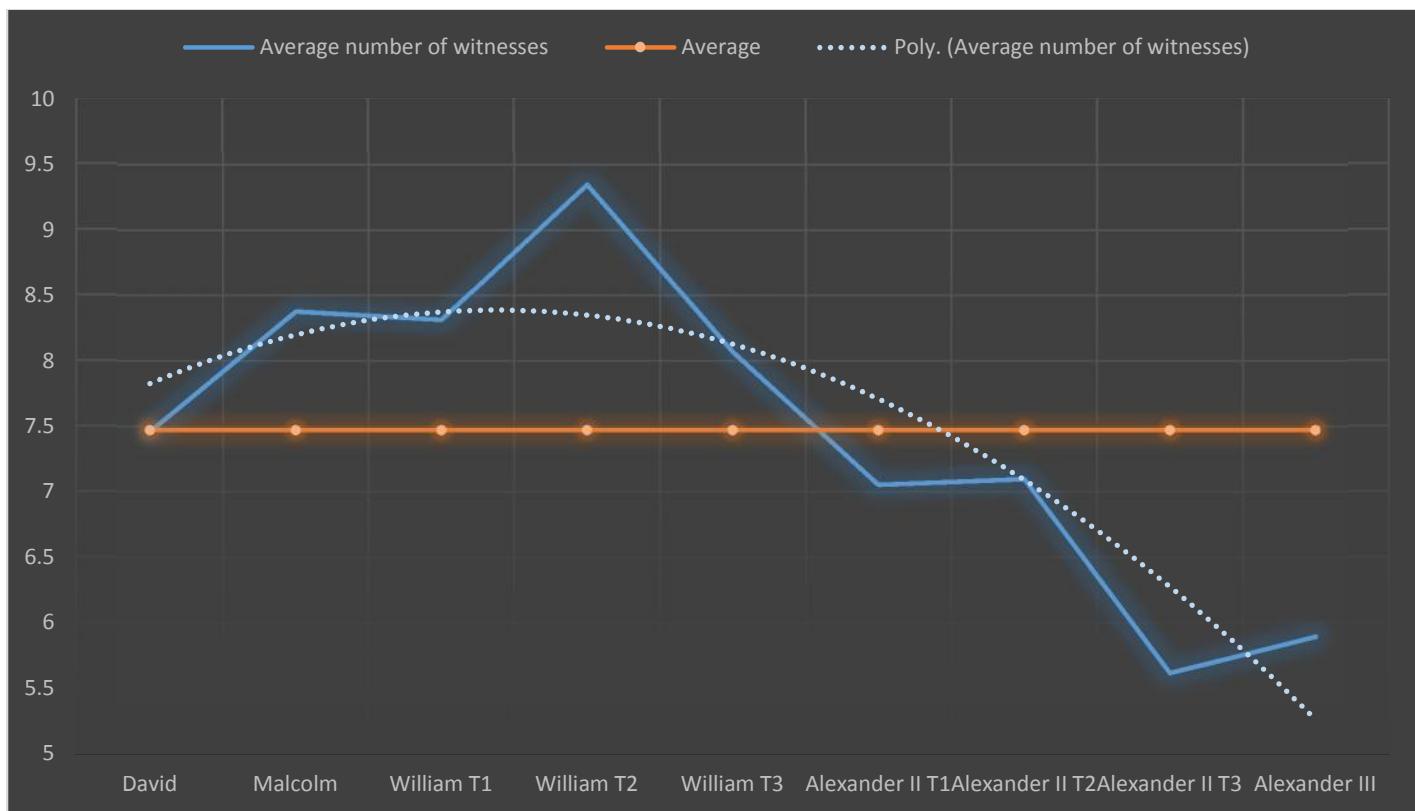


Figure 5.189 allows a comparison of the numbers of documents in each reign or time slice with the numbers of witnesses in each time slice. It must be remembered, however, that the time slices each contain some documents which are only possibly dated to that period, so there is a small amount of duplication of documents in those sections. There is clearly a correlation between the number of documents and the number of witnesses; as a general rule, the more documents in the period, the more witnesses there are likely to be. In the longer periods of David's and Alexander III's reigns, there are more witnesses despite fewer documents; this is due to the longer time periods. What is noteworthy is that the first time slice of Alexander II's reign features a clear dip, which is more pronounced with the witnesses than the documents. This is partially due to the fact that William T2 is 17 years and William T3 is 19 years, whereas Alexander II T1 and T2 are each only 11 years (One reason why it is worthwhile considering breaking Alexander II's reign into two shorter time slices). When the fact that William T3 is 19 years long is taken into account, by dividing the number of witnesses by the number of years in the time slice, and then multiplying by ten to make it more comparable to the others, we see that William T3 is really the period when the numbers of witnesses in the network is most depressed, and that this is actually growing in Alexander T1 to a peak in Alexander T2.

Figure 5.190. Average number of witnesses in each reign or time slice

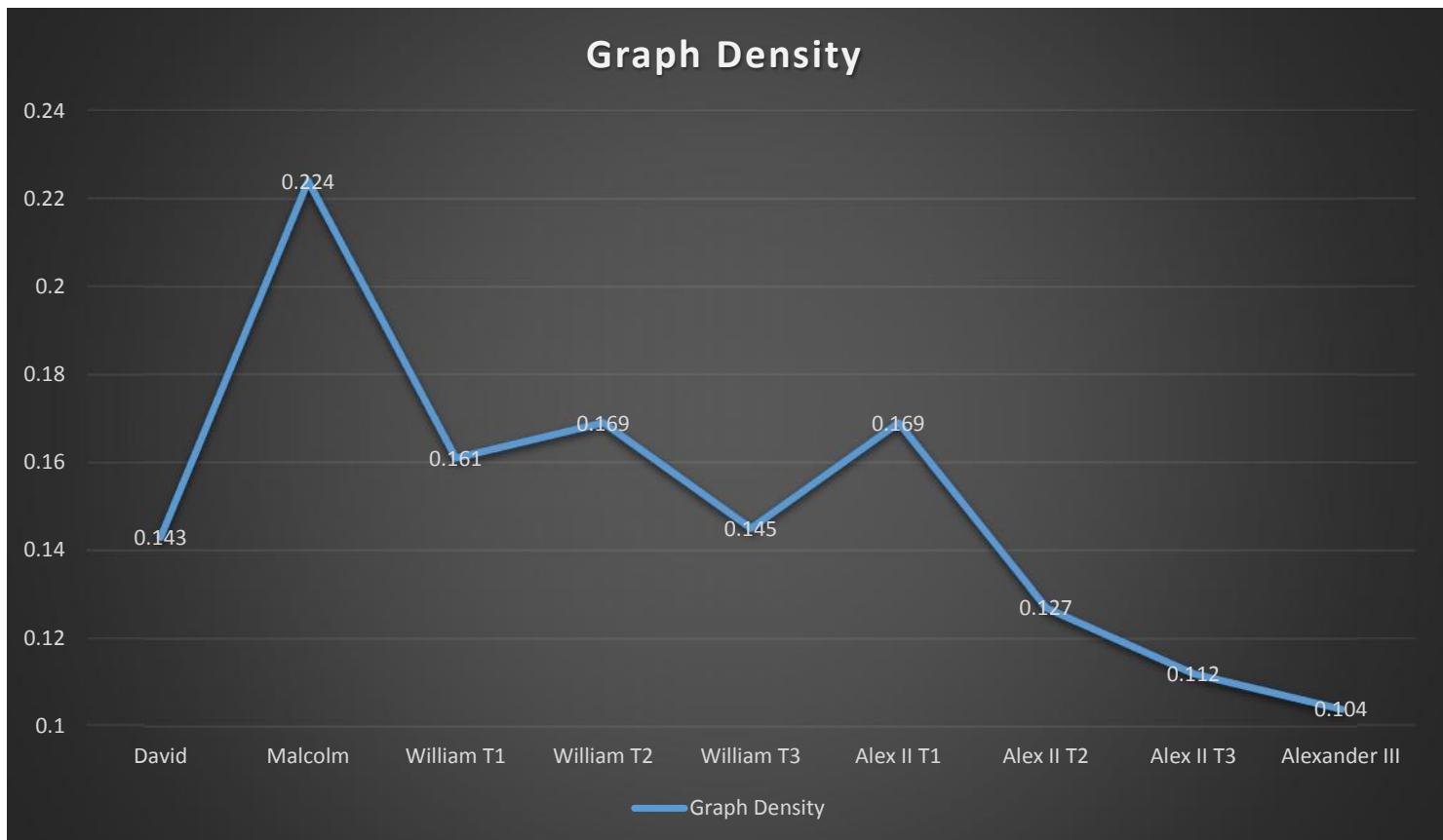


We may also want to acknowledge variation in how long were the witness lists from which our witnesses' names have been drawn. The longer the witness lists, the greater the chance a given individual co-witnessed alongside another individual. The average of all the reigns and time slices together is about 7.5, but there is considerable variation in each reign. Most periods between 1153 and 1214 average slightly more than 8 witnesses per document, but this rose in the 1178-95 period to a peak of 9.34. The witness lists in after 1214, however, tended to be shorter. This is a product of the shift from government by political assembly to routine administrative function. From 1214 to 1235, the average witness list is just over 7 people, but in the period of 1236 to 1286, this decreases even more to just over five and a half. This is one reason why networks in the period 1153 to 1235, and especially the first half that era, seem to be denser and richer than those in the later period. But it should also be kept in mind that this is a reflection of reality – there were still likely more top power players in the room in the period when charters average over 9 witnesses than when they averaged under 6. If the mid-thirteenth century was more fractured and less dense in the networks of top actors, the adoption of routine administration and the fact that top players seem to have spent less time physically together may have been part of the reason why.

## B. Graph density

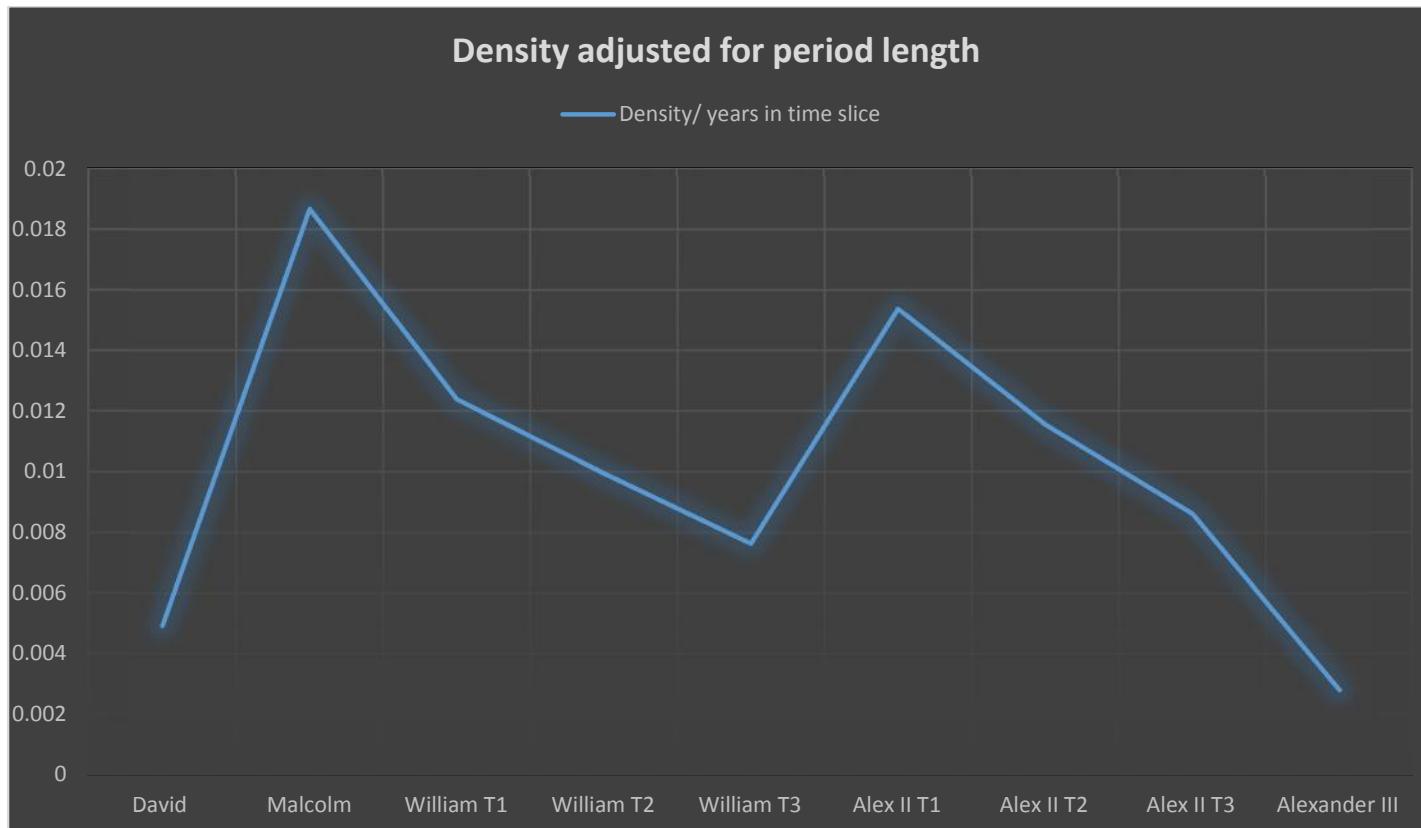
The concept of graph density offers us a way of getting a better view on the issue of how interconnected were the actors in any particular time slice or reign. Density describes what proportion of the potential ties are actually present. In a sociogram with 100% density (or the value 1), every node would be connected to every other node with an edge. The reign of Malcolm IV was characterised by a higher density (or 'connectedness') than later periods of similar length. The densities of David and Alaexnder III's reigns are lower, which is partially due to the longer time periods, but there is an evident trend towards lower density and less interconnectedness over the period. We saw this in the smaller numbers of documents witnessed by the most productive co-witnessing pairs in the later time slices. It is also notable that William T2 (1178-95) and Alexander II T2 (1225-36) have the same density (.169, or 16.9% of possible ties actualised), but there is a marked dip in the middle. This appears to be a period of less interconnection.

Figure 5.190. Comparison of graph densities of reigns and time slices



Obviously, we would feel much more confident in our analysis if each reign and time slice was characterised by absolutely equal numbers of year lengths, documents, and witnesses. However, by dividing the density results by the length of time slices and comparing the graphs, we should be able to reach a higher level of confidence in the results. Figure 5.191 shows the resulting numbers when we divide the density by the lengths of time in each time slice. Unlike the numbers in Figure 5.190, where, for example, the graph is telling us that 14.3 of the potential ties in David's reign are actualised, the resulting quotient in 5.191 does not tell us something in absolute terms, but it does tell us whether the periods relative to one another stand in similar positions. Figure 5.191 continues to show peaks in the reign of Malcolm IV and the first time slice of Alexander II. The second time slice of William's reign, adjusted for length of time, is no longer at the same level of A2T1, and the third time slice of William's reign (for WT2 and WT3 are the longest of the six time slices) now appears as a deeper low than unadjusted.

Figure 5.191. Graph densities adjusted for lengths of periods



A highly dense network is more interconnected. This means there are more close relationships between the actors. People know each other well. Highly dense networks are characterised by safety, security, and stability. Less dense networks are less stable and thus more dynamic and more open to new ideas and change. The reign of Malcolm IV is marked by a dense network of royal charter witnesses. This trend decreases through the reign of William I, reaching a nadir in the period of 1195-1214. The network early in the reign of Alexander II represents another peak in density, followed by further tailing off.

Figure 5.192. Graph densities adjusted for average witness list length

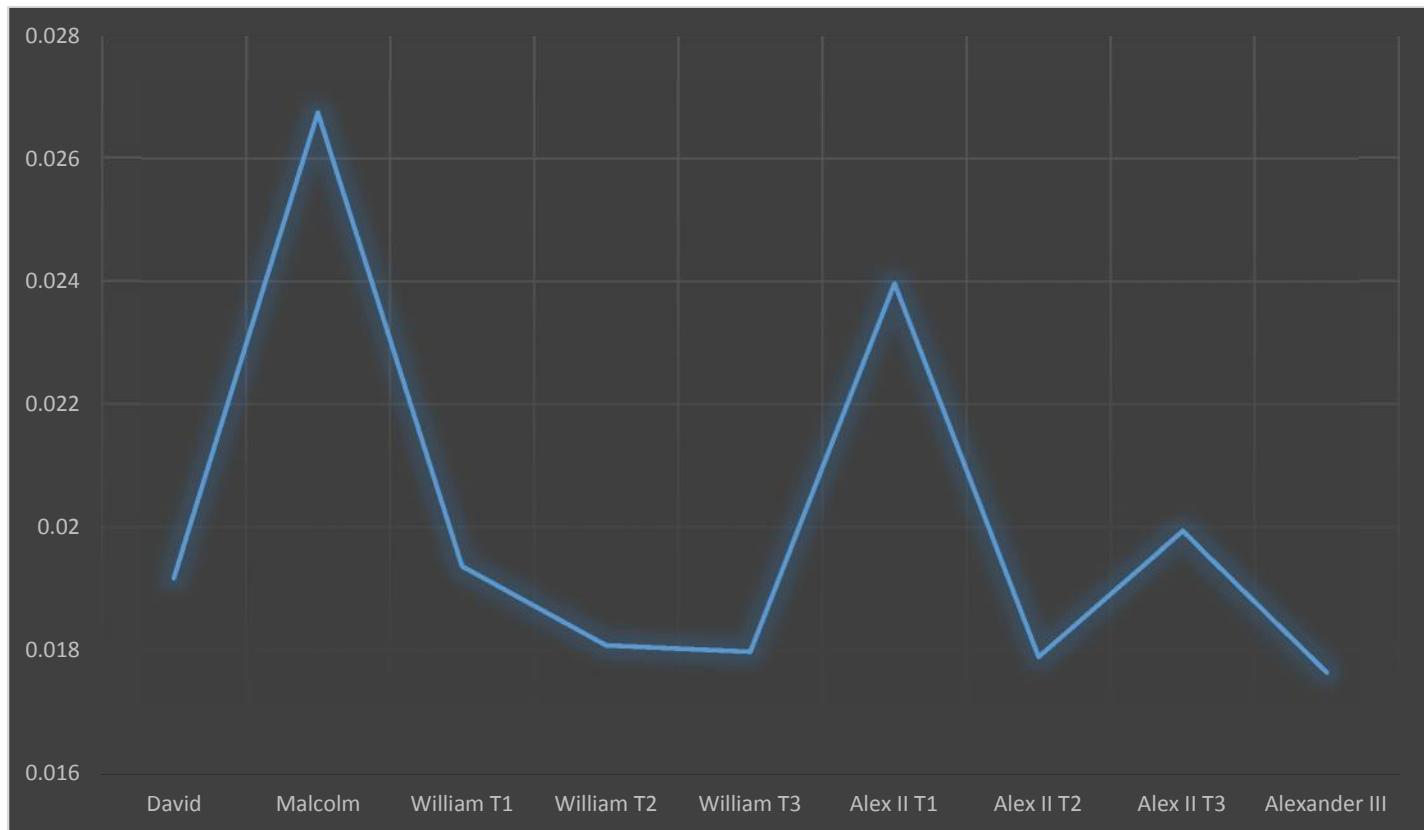


Figure 5.192 shows gives the quotients of graph density divided by the average length of the witness lists in each time slice or reign. This should allow us to ask to what extent the trailing off in the later periods is primarily the result of shorter witness lists. We still have the noticeable peaks in Malcolm IV's reign and the first time slice of Alexander II's, and the relatively lower density during William's reign. The second time slice of Alexander II's reign now drops to the same level as William's reign, but there is another small peak in the period of A2T3 (1236-49). It is hard to know how much trust to place in

this graph, however, when we consider that variations in witness list length were not just an 'artificial' variable but to a certain extent reflect some kind of reality on the ground. So this particular graph should be taken with a grain of salt.

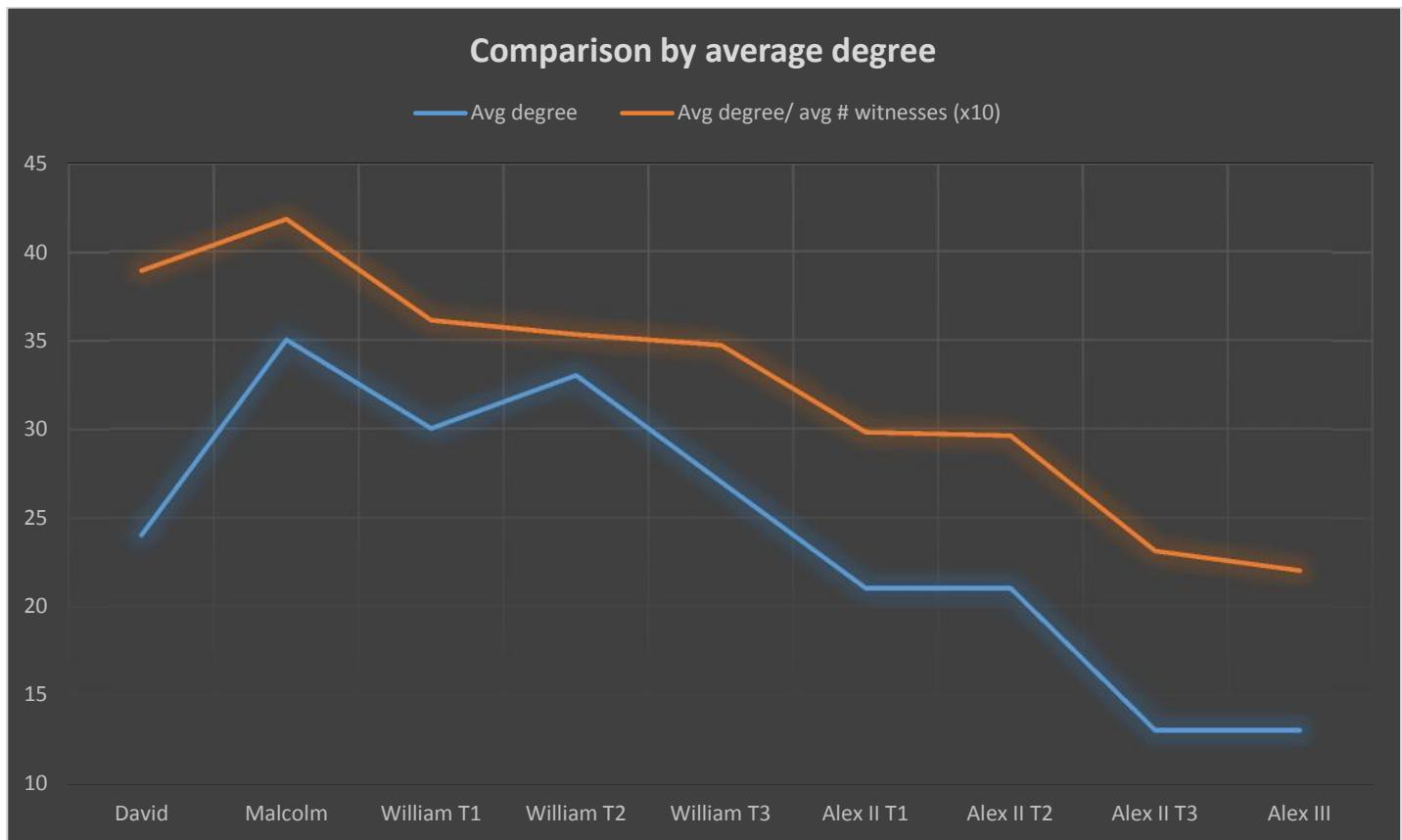
### C. Degree

Degree centrality in the context of witnesses to charters, it is helpful to remember is the number of people with whom a given individual has 'co-witnessed'. Thus we can say that Duncan (II), earl of Fife (d. 1204) had 202 co-witnessing 'contacts' in surviving documents of the five specified document types. It is also possible to calculate the average degree of a graph, so that we can see what was the average number of co-witnessing contacts held by a given (hypothetical) node. As table 5.71 shows, the average degree hit a high of 35 in Malcolm's reign, fluctuated between 33 and 27 in William's reign, and then decreased to 21 between 1214 and 1235 and down to 13 between 1236 and 1286. The average degree is thus in some way affected by the numbers of witnesses and the density, or interconnectedness of those witnesses, with the late twelfth century the most fruitful period. Figure 5.192 also shows the average degree divided by the average number of witnesses, and then multiplied by ten for purposes of comparison. This should be thought of as the average number of co-witnessing 'contacts' adjusted according to the lengths of witness lists in each reign or time slice. As with other comparisons, the peak in the second period of William's reign is flattened out; otherwise, the trends are pretty comparable. Even adjusted in this way, the later periods are characterised by smaller networks of 'contacts' than the peak reached under Malcolm IV and the relatively high levels maintained through William's reign.

Table 5.71. Various statistics

Reign/ Time slice	Length time	Average # witnesses	Graph density (%)	Clustering coefficient	Average degree	Average degree/ avg. # witnesses
David I	29	7.458	14.3%	.828	24	3.89
Malcolm IV	12	8.375	22.4%	.829	35	4.18
William T1	13	8.313	16.1%	.812	30	3.61
William T2	17	9.346	16.9%	.768	33	3.53
William T3	19	8.067	14.5%	.785	27	3.47
Alexander II T1	11	7.053	16.9%	.788	21	2.98
Alexander II T2	11	7.097	12.7%	.785	21	2.96
Alexander II T3	13	5.618	11.2%	.741	13	2.31
Alexander III	37	5.896	10.4%	.774	13	2.2

Figure 5.192. Comparison of reigns and time slices by average degree



#### D. Analysis of edges and cliques

Table 5.72. Number of edges in each time period

Time period	#edges	#years	Edges/years	Edges/docs	Edges/ witnesses
David I	2100	29	72.41	/83= 25.3	/172= 12.2
Malcolm	2744	12	228.67	/88= 31.2	/157= 17.5
William T1	2717	13	209	/128= 21.2	/184= 14.8
William T2	3287	17	193.4	/156= 21.1	/198= 16.1
William T3	2442	19	128.5	/134= 18.2	/184= 12.3
Alexander T1	1250	11	113.6	/94=13.3	/122=10.2
Alex2 T2	1824	11	165.8	/123=14.8	/170=10.7
Alex 2 T3	810	13	62.3	/68=11.9	/121=6.7
Alex 3	872	37	23.6	/67=13	/130=6.7

It is also worth comparing the numbers of edges between each reign or time slice. Edges (or ties, the number of which is always twice the number of edges) show the connections between nodes, or, in our case, whether or not two people appeared as witnesses alongside one another. The numbers of edges, or connections, are above 2000 up to 1214, with considerable diminishing in the reign of Alexander II, falling to below 1000 after 1235. It obviously makes sense to consider the variations in lengths of time between the various periods. Table 5.72 shows that in terms of edges per year, we go from 72 under David to a peak of 229 under Malcolm. When the length of Alexander III's reign is taken into account, the number is only a fraction of the previous period. Figure 5.194 shows the numbers of edges compared to an adjusted number taken by dividing the number of edges by the number of years, and multiplying by ten. In that calculation, the numbers for the longer periods, such as the reigns of David I and Alexander III, as well as the second two periods of William's reign, are depressed, while the numbers for the time slices from Alexander II's reign (11 to 13 years) track very closely and the numbers from the period 1153 to 1178 (periods of 12 and 13 years) are fairly comparable. The periods of Malcolm's reign and the second slice of Alexander II's reign appear as significant peaks.

Figure 5.194. Comparison of numbers of edges

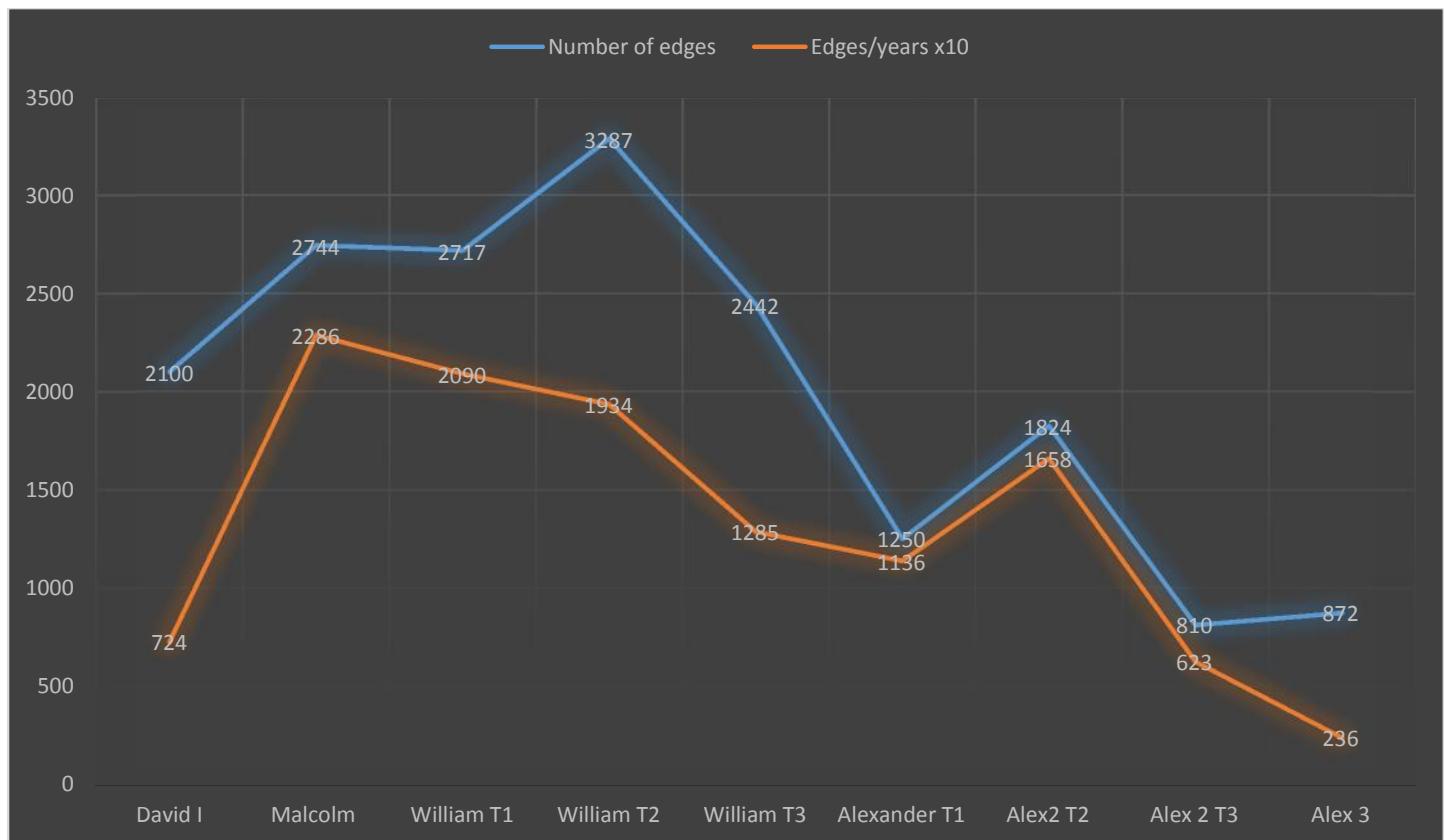
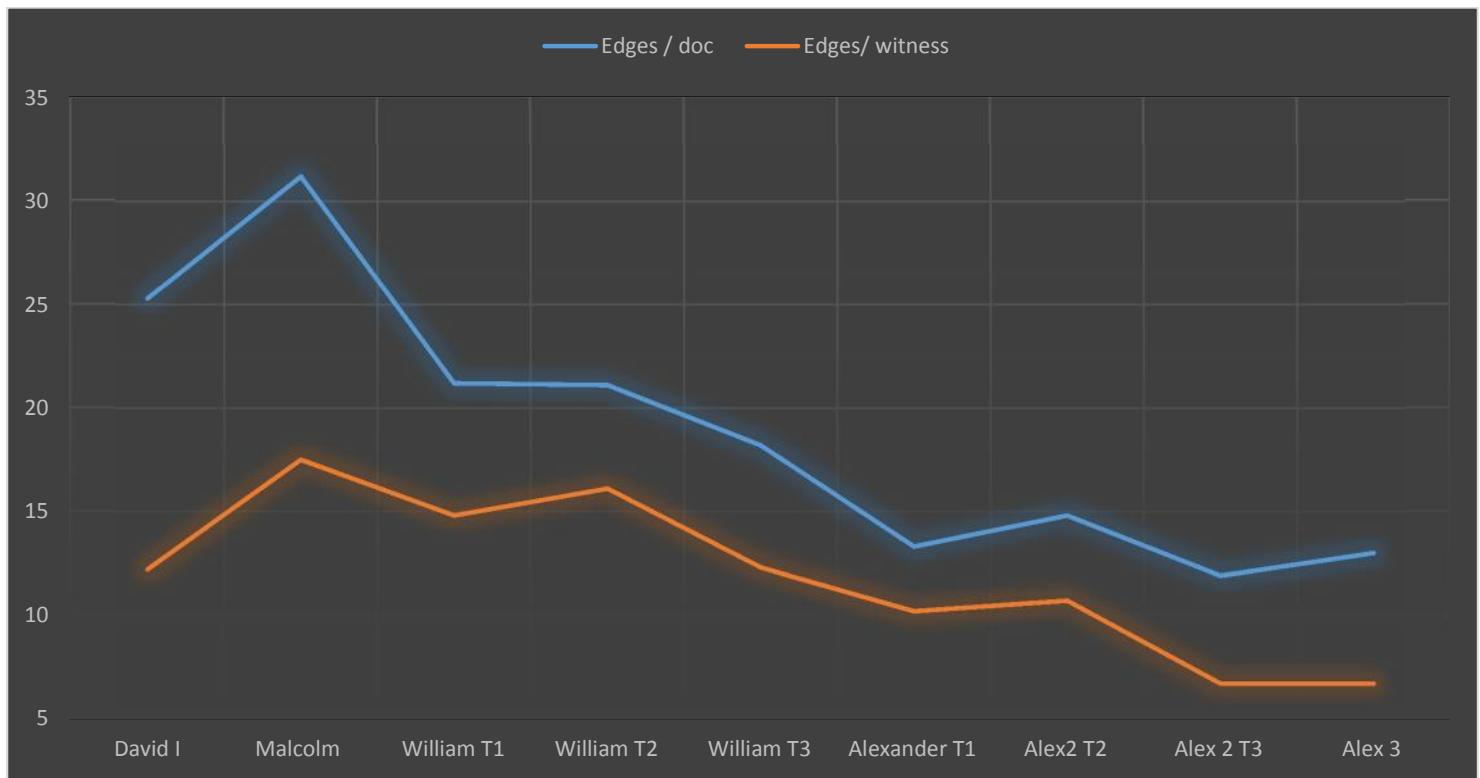
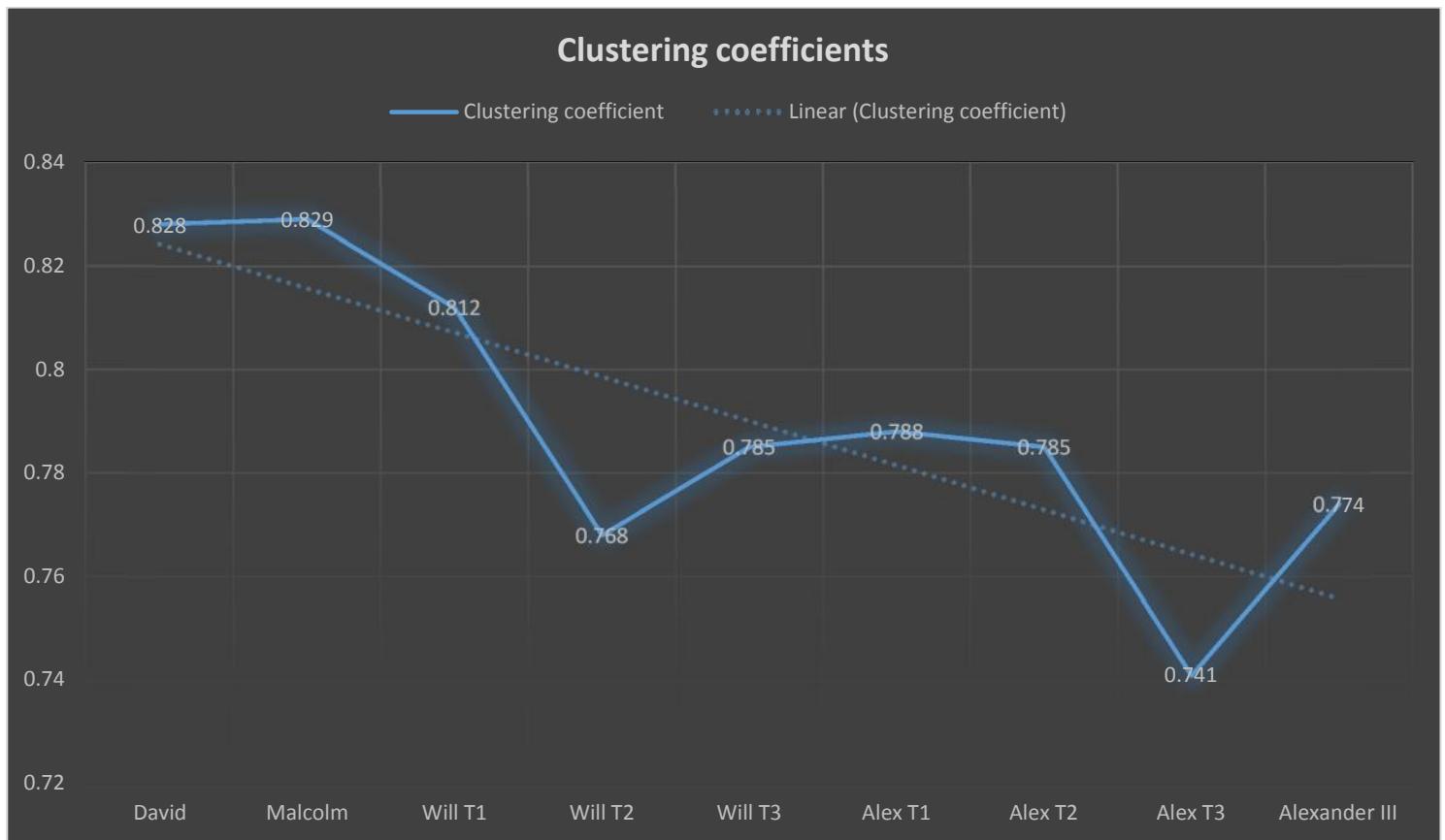


Figure 5.195. Edges adjusted for numbers of documents and witnesses



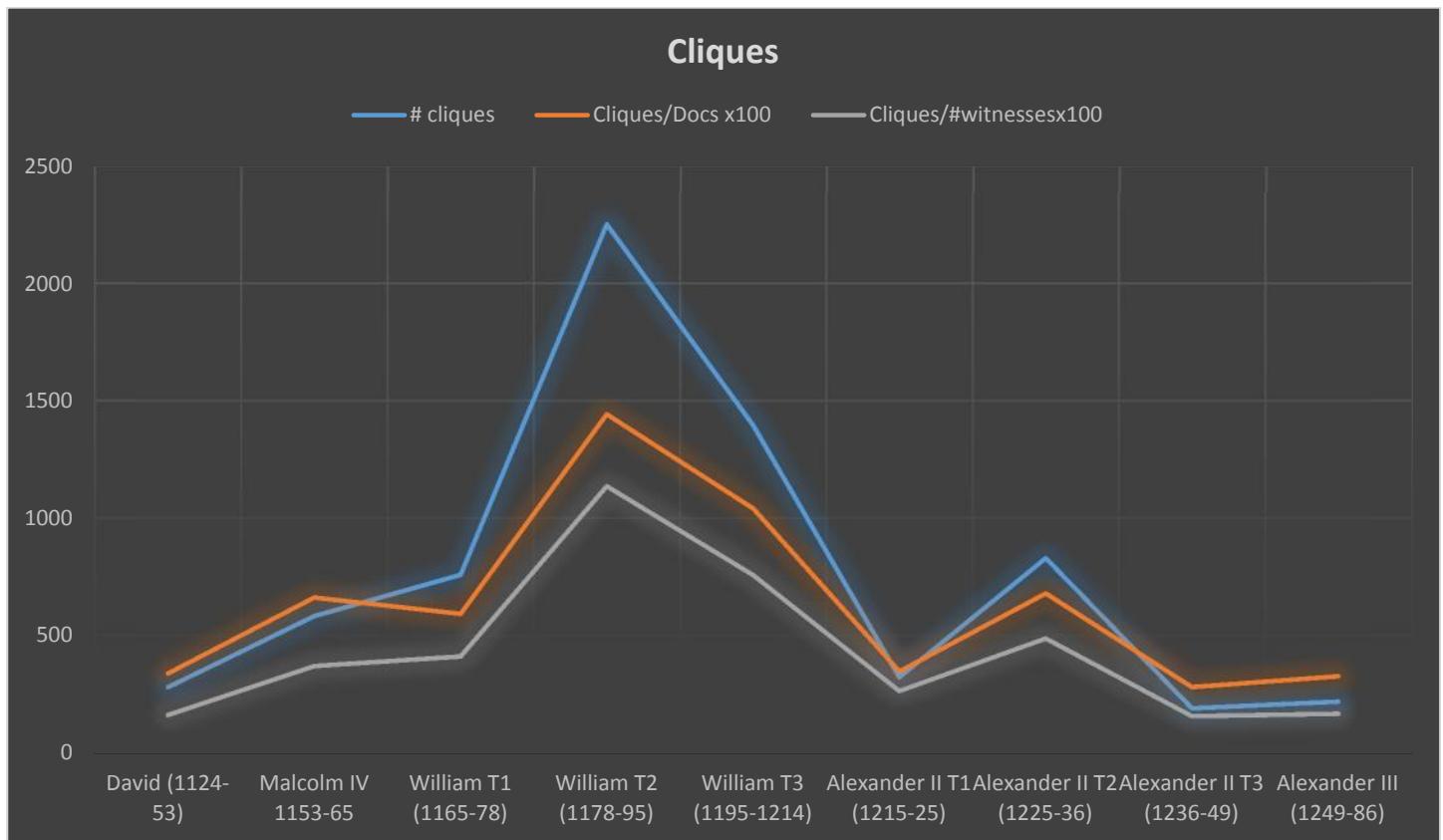
When we adjust the numbers of edges for variations in numbers of documents and in numbers of witnesses, we see similar patterns. Given the number of documents available, Malcolm's reign is again significant, although this is less of a departure from other periods when we consider the number of witnesses in the time period. Another point from all the analyses of edges is that the last 19 years of William's reign were a period characterised by a great fall in the numbers of connections between individuals.

Figure 5.193. Average clustering coefficients



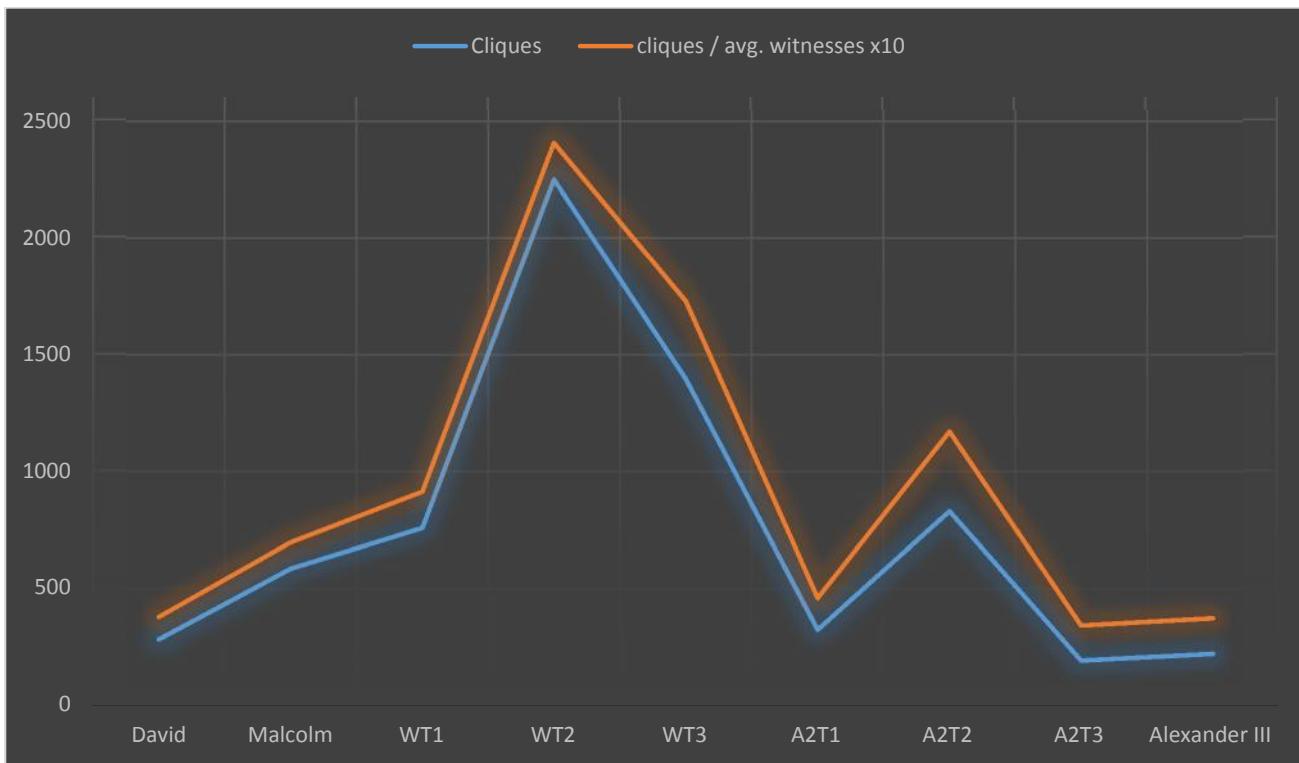
In the 1990s, D.J. Watts and Stephen Strogatz developed the concept of the average clustering coefficient, measured by taking the average of local clustering coefficients of all the vertices. This was a refinement of the older concept of Global Clustering Coefficient. The concept is based on transitivity, whereby triplets (three nodes connected with two edges connecting them through a single node) tend to 'want' to become closed triangles (three nodes with three edges). We see higher tendency to clustering in the period 1124 to 1178, with a dip in the period 1178-95, with a kind of plateau between 1195 and 1235, followed by a dip in the last period of Alexander II's reign.

Figure 5.196. Cliques and cliques adjusted for document numbers



Cliques, of course, are subgraphs in which all the nodes are mutually interconnected (Prell, 155). Cliques indicate groups of people characterized by intimacy, trust, and cohesiveness. Examining the numbers of cliques in each reign or time slice gives us another view of how cohesive, how interconnected, were the networks of co-witnesses at various points in time. While the general pattern we have seen before is recognizable, what really stands out about this analysis is that it is not Malcolm IV's reign but the second time slice of William I's reign (1178-95) which had high numbers of cliques. This is despite the fact that there were only 14 more witnesses in the study than in the first or third time slices of William's reign (198 compared to 184). There were 2250 cliques in William T2 compared to 584 in Malcolm IV, 759 in William T1, and 1395 in William T3. Adjusting the view for the number of documents, as well as for the number of witnesses in each time slice does not alter significantly the notion of a peak in the years 1178-95. As Figure 5.197 shows, the numbers of cliques track quite closely with numbers adjusted for differences in lengths of witness lists. These graphs suggest that variations in the numbers of cliques across the reigns and time slices are not just down to the differences in the number of documents or how long the witness lists were.

Figure 5.197. Cliques adjusted for average number of witnesses



Finally, the following graphs are provided for purposes of comparison with the above time slice analyses as regards the numbers of triangles in the ego-networks of the top actors by degree centrality.

Figure 5.198. DAVID I WITNESSES (Top 15 by degree)

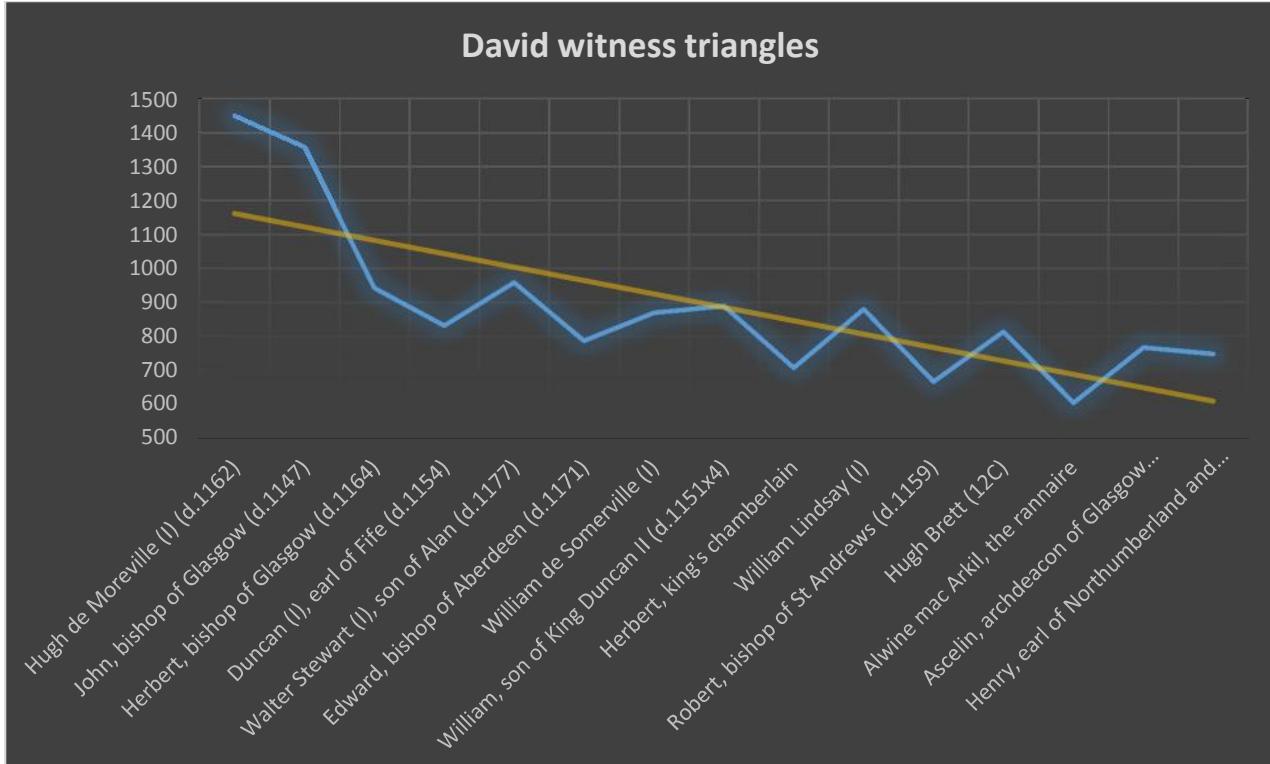


Figure 5.199. MALCOLM IV WITNESSES

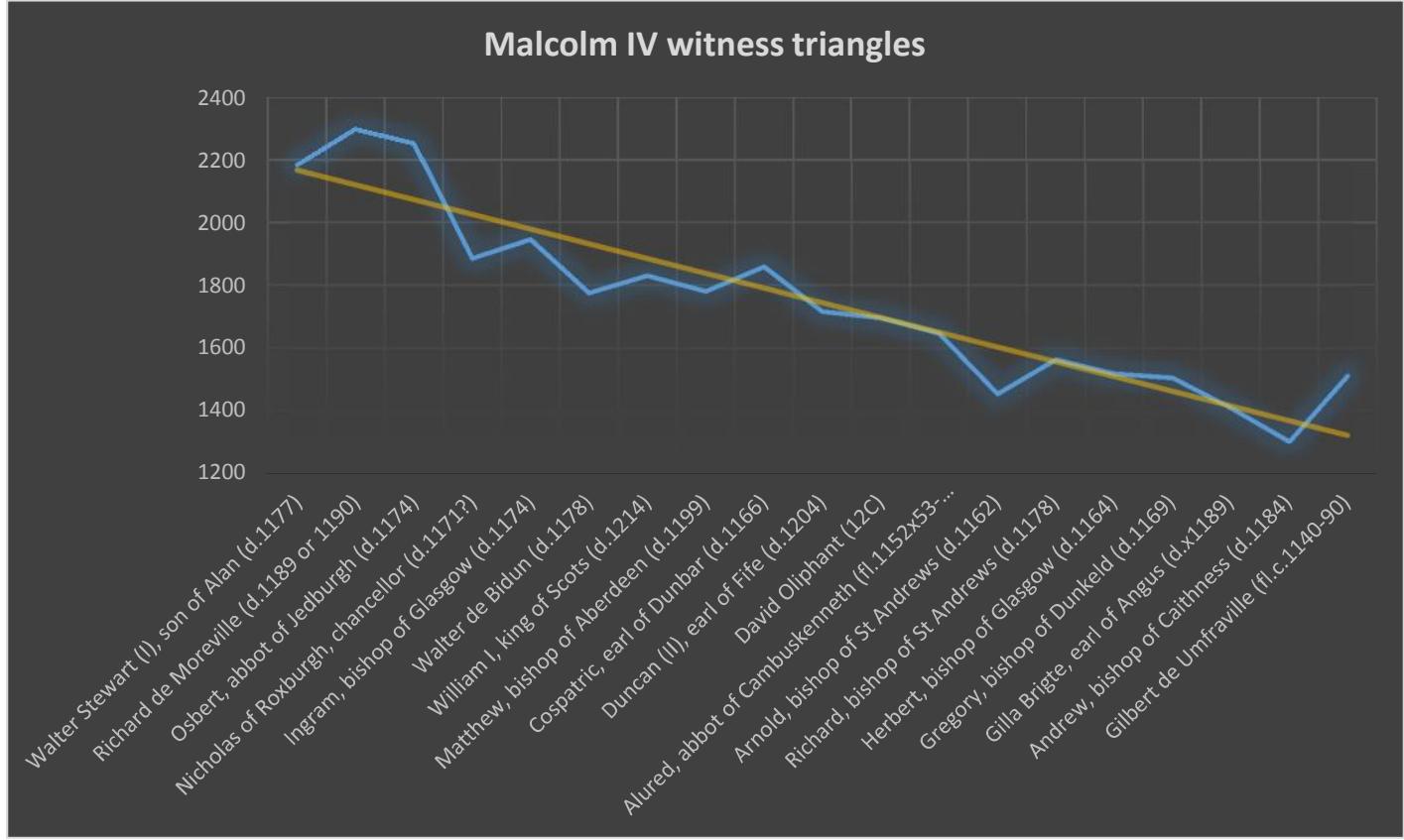


Figure 5.200. WILLIAM I WHOLE REIGN WITNESSES (top 20 by degree)

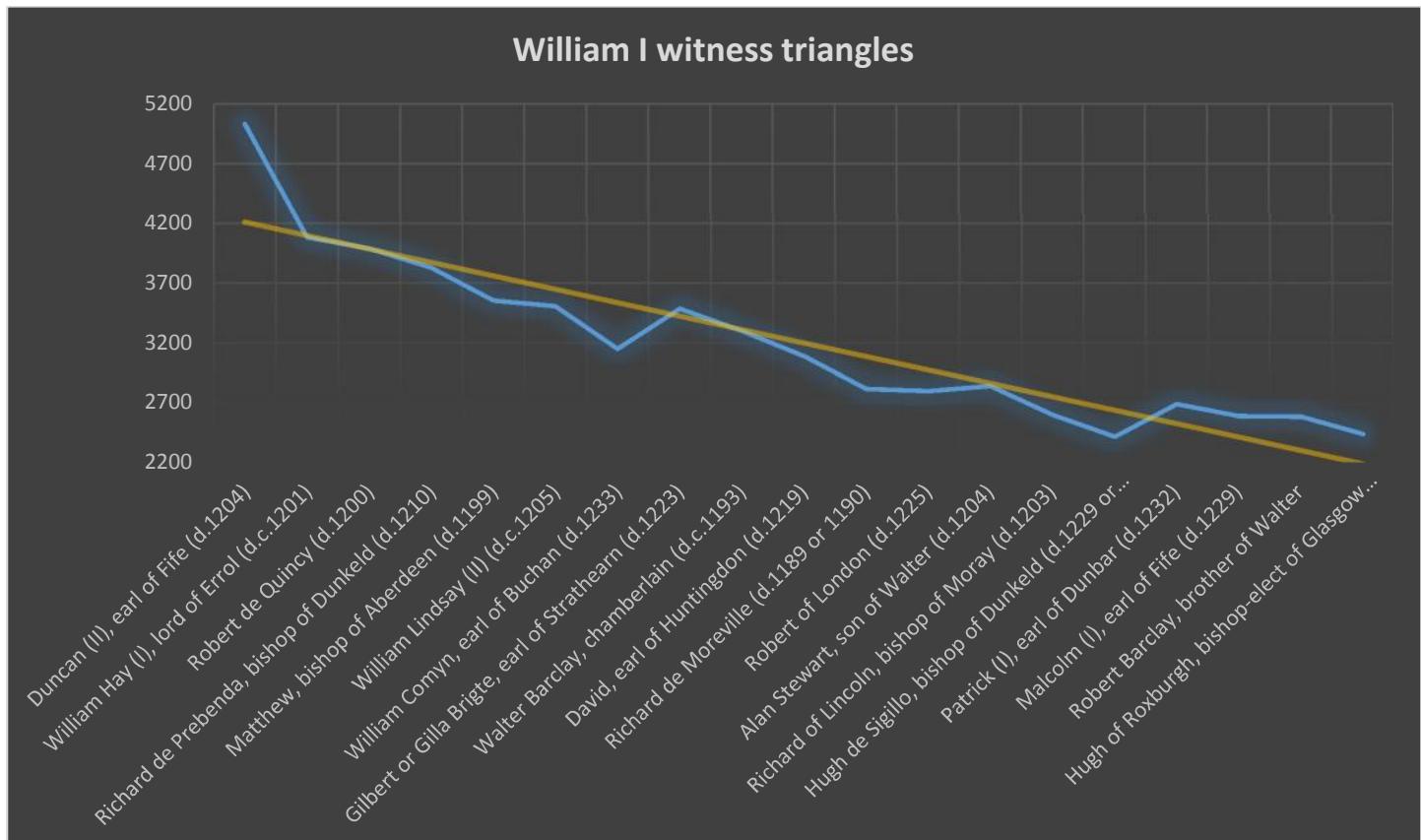


Figure 5.201. ALEXANDER II WHOLE REIGN TRIANGLES (top 20 by degree)

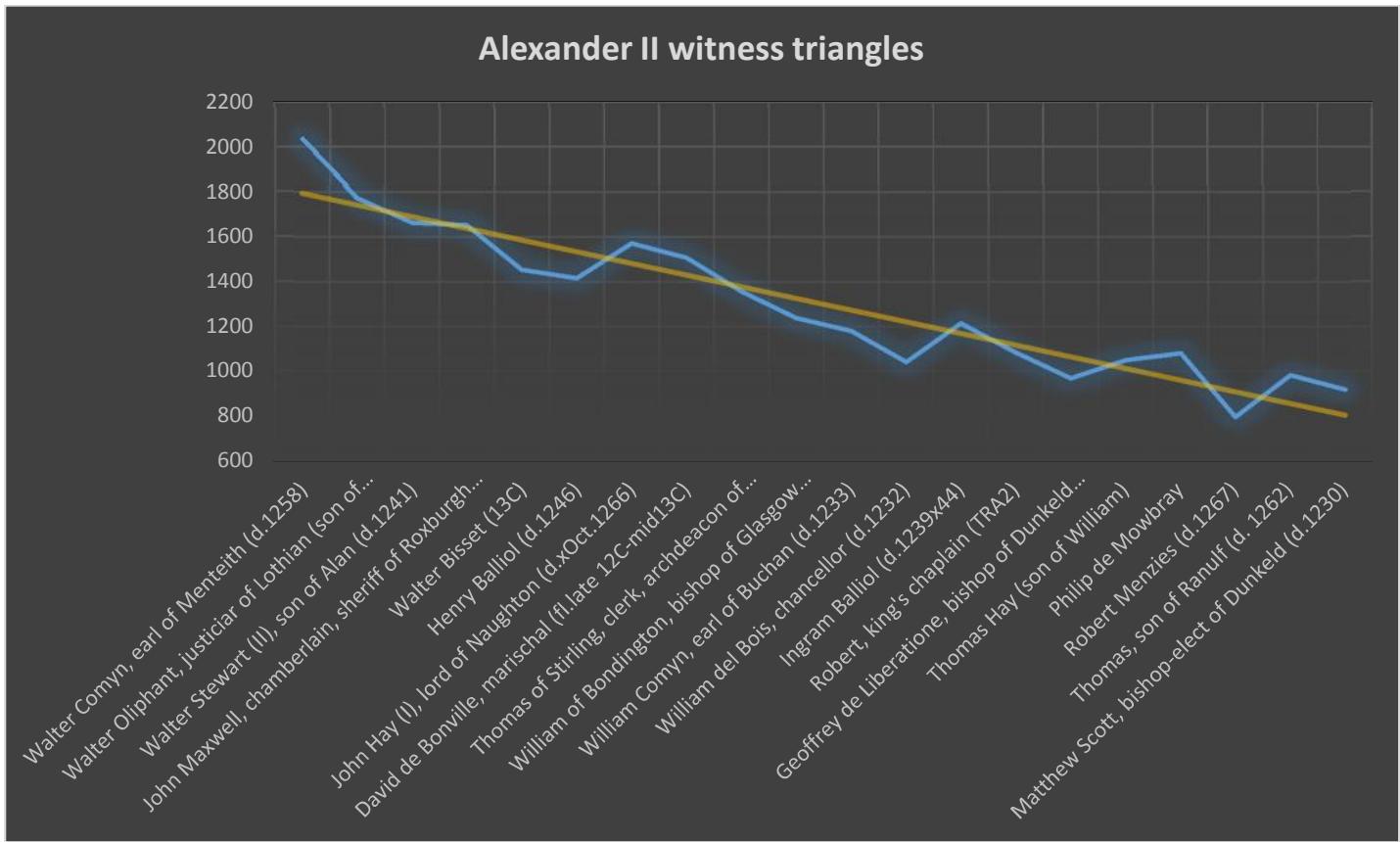


Figure 5.202. ALEXANDER III TRIANGLES

