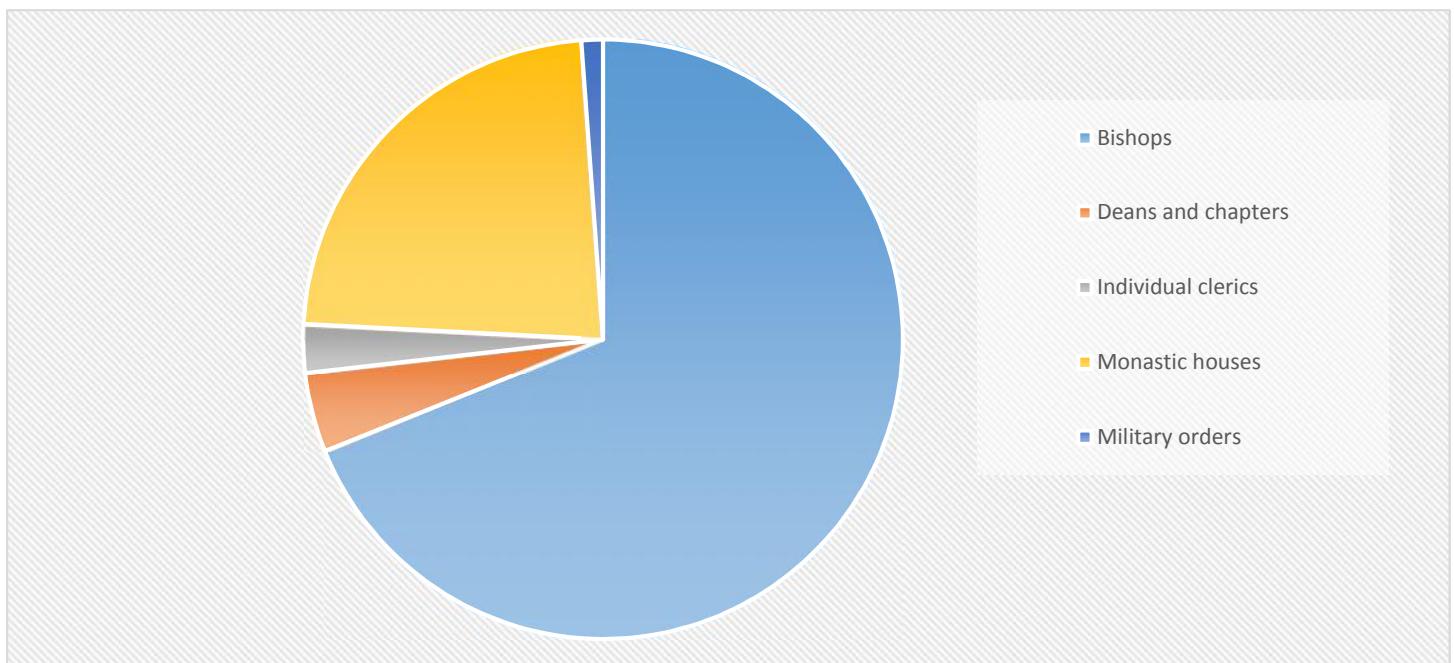


6 CO-WITNESSING NETWORKS: OTHER GRANTOR CATEGORIES

PART ONE: NETWORK OF ALL ECCLESIASTICAL (H2) GRANTORS

The Social Network Analysis of all ecclesiastical documents includes 608 documents, 2009 witnesses, and 19,757 edges. This study is based on the five specified document types in sources with an H-number beginning with 2. Of the 608 documents, 594 (97.7%) of which are charters. There are also 13 notifications and one charter/brieve. Agreements and settlements are not included in the study, as they are H4 documents. Of the 608 documents, over two-thirds (419) are episcopal, with a further 26 documents issued by deans and chapters or individual members of chapters. There are a further 16 documents in the names of various clerks, chaplains, magistri, and other individuals. 23% of the documents were in the names of heads and other members of religious houses, and there were a further 7 documents from military orders. Within the episcopal category, 194 were documents of the bishops of St Andrews, accounting for 46% of episcopal documents, while the bishops of Glasgow accounted for a further 62 documents. Of the religious houses, 41 were from St Andrews priory, 21 from Kelso abbey, and 14 from Arbroath abbey.

Figure 6.1. H2 ecclesiastical documents by grantor category



There were 2009 witnesses in the dataset, of whom only two were women. There were 24 institutions, and the remaining 1983 were individual men.

Figure 6.2. Netdraw: witnesses to H2 documents

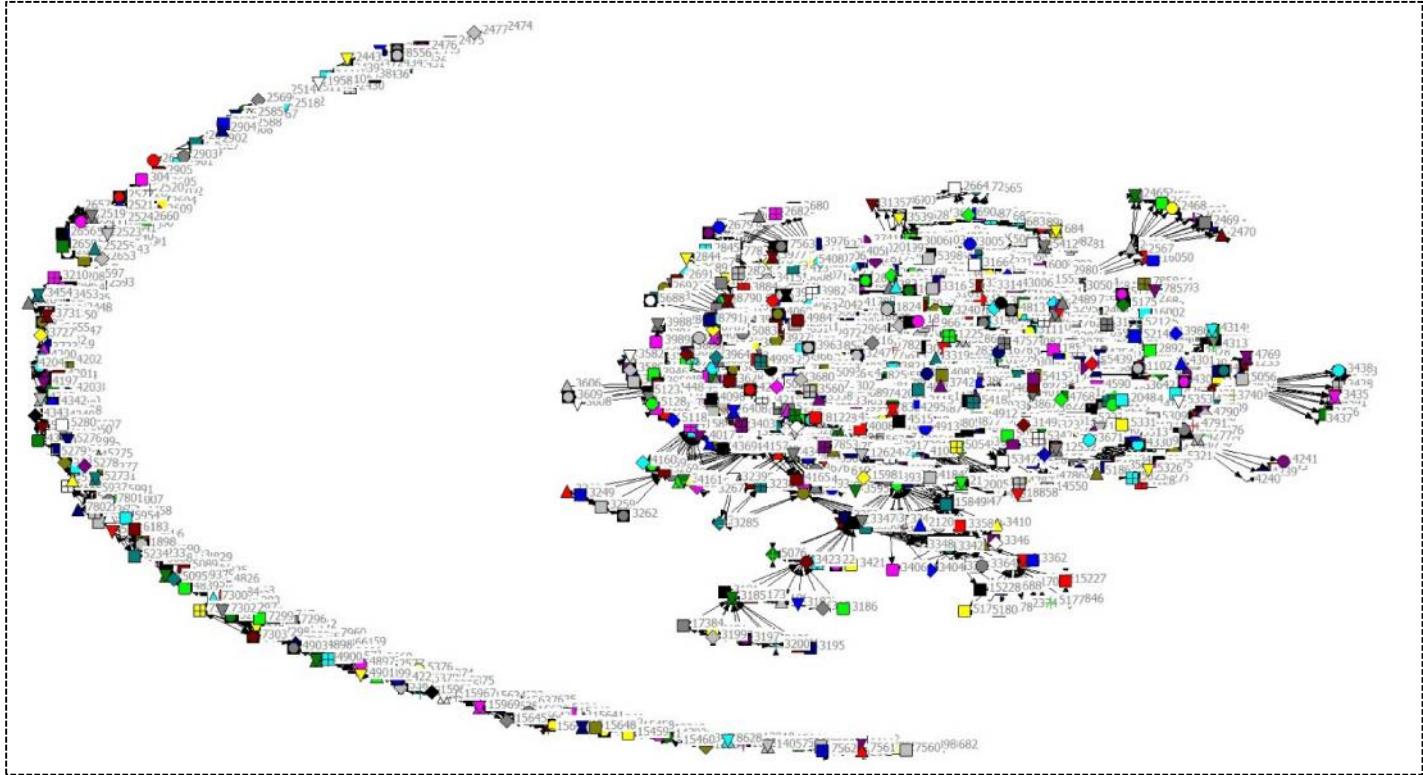
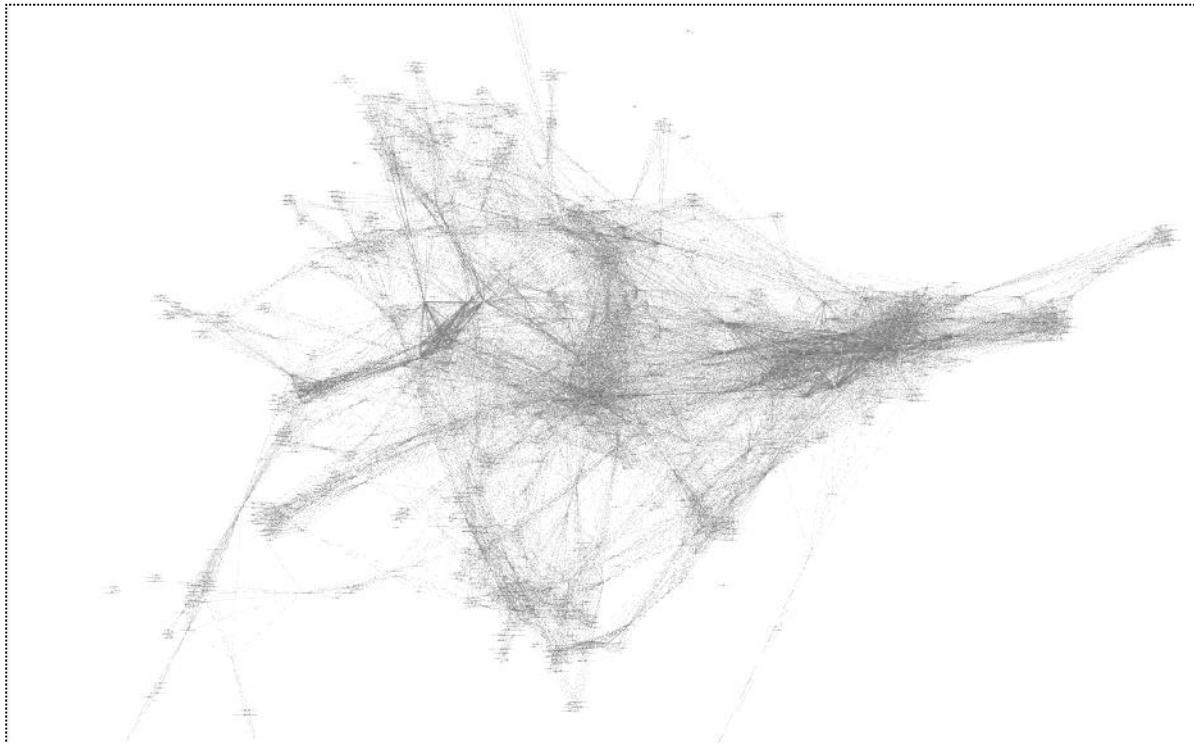


Figure 6.3. Gephi: witnesses to H2 documents



The king's clerk and chancellor William del Bois, who has the highest betweenness centrality in the study of all witnesses (see chapter 4), also has the highest betweenness among all H2 documents (see Table 6.1). As the greatest concentration of individuals is based around the diocese of St Andrews, and the sociogram breaks into various divergent segments by the level of more than 3 co-witnessing acts (see Figure 6.4, below), most of the figures with high betweenness were active in the diocese of St Andrews, including the archdeacons Laurence of Thornton [825], Matthew bishop of Aberdeen [2] (archdeacon of St Andrews from ca 1150 to 1172), Master Adam of Makerstoun [3350], provost of the céli De house of St Mary's on the Rock, Bishop William Malveisin's clerk and chaplain, Peter [2971]. The second most important element in the structure of the sociogram are those people based around the diocese of Glasgow, such as Bishop Walter of St Albans, a previous royal chaplain [858], and the archdeacon Robert [797]. The only lay witnesses with high betweenness were Duncan (II) earl of Fife [13] and Gilbert earl of Strathearn [260]. Finally, it is important to note that the predominance of the secular church over the monastic is a reflection of the makeup of the documentary corpus, as described above.

Table 6.1. Top twenty by betweenness centrality (H2)

Person ID	Name	Betweenness Centrality
42	William del Bois, chancellor (d.1232)	126064.1196
835	Laurence of Thornton, archdeacon of St Andrews (d.1238x40)	95497.14191
2	Matthew, bishop of Aberdeen (d.1199)	92825.68178
2971	Peter, chaplain and clerk of Bishop Malveisin	77211.85245
3350	Adam of Makerstoun, master, provost (d.1280x86)	74011.29714
3871	Edward Murray, master, canon, bishop's clerk	67278.2338
2762	Henry, archdeacon of Dunkeld (fl.1183x1203-1220x25)	63200.2405
13	Duncan (II), earl of Fife (d.1204)	61723.18072
850	John Scott, bishop of Dunkeld (d.1203)	59962.36012
858	Walter of St Albans, bishop of Glasgow (d.1232)	59013.85368
926	Elias of Partick, clerk, canon (son of Fulbert)	58299.16776
797	Robert, archdeacon of Glasgow (d.1222)	51145.2434
829	Ranulf de Wat, archdeacon of St Andrews (d.1209)	50012.20541
2044	Walter de Mortimer, dean of Glasgow (d.1270x71)	44811.84647
3521	Adam de Prebenda, dean of Dunkeld (fl.1229x36-45)	41021.18185
859	Alexander de St Martin, master (fl.1214x40-1247)	40858.55692
3337	Simon Wallace, master, official of St Andrews	39985.35595
776	John of Huntingdon, master, official of Glasgow (fl.1179x1208)	37409.88544
260	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	36061.66232
3250	Nicholas of Moffat, archdeacon of Teviotdale (d.1270)	35795.98353

Figure 6.4. Netdraw: witnesses to H2 documents, >3 co-witnessing instances

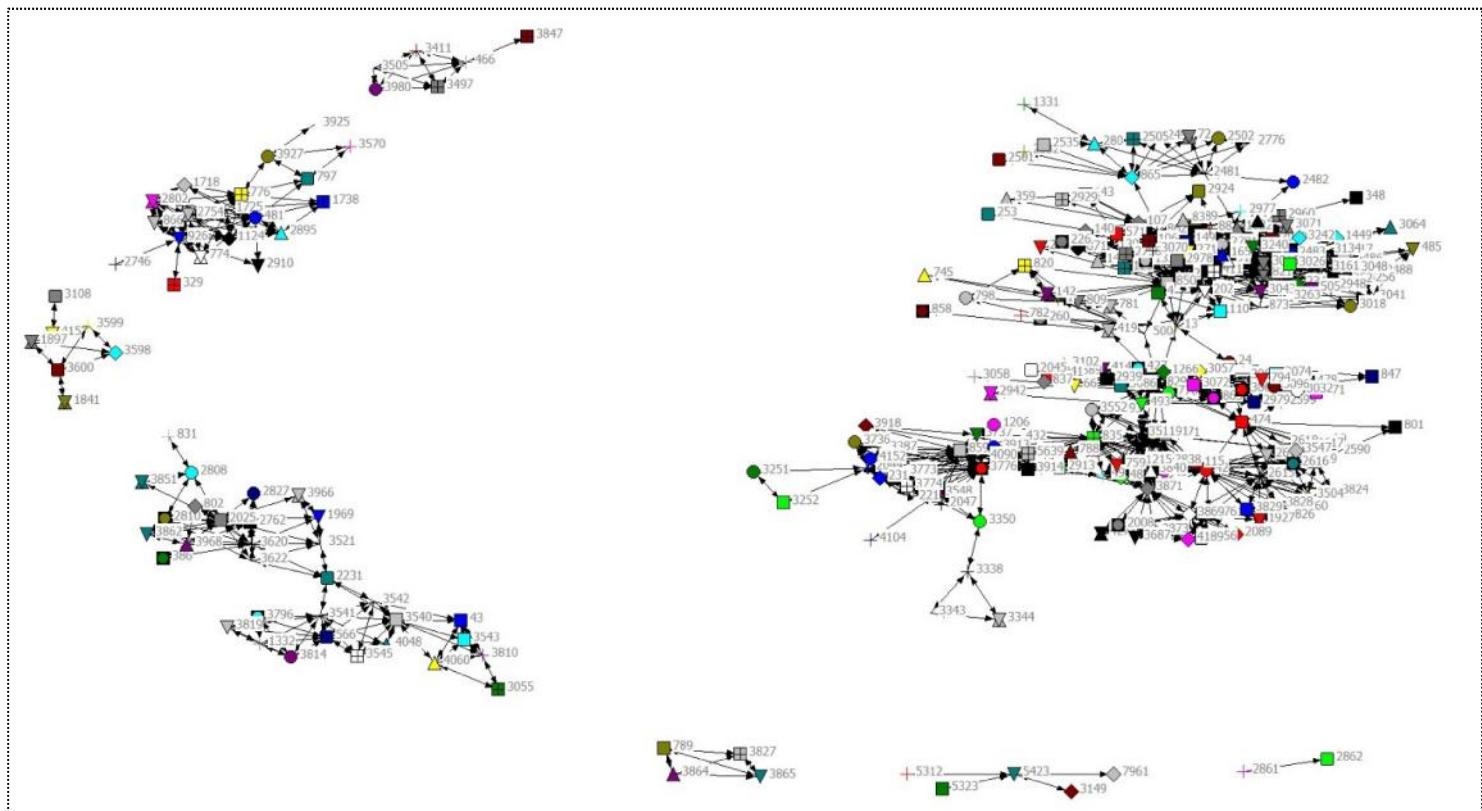


Figure 6.5. Netdraw: witnesses to H2 documents, >5 co-witnessing instances

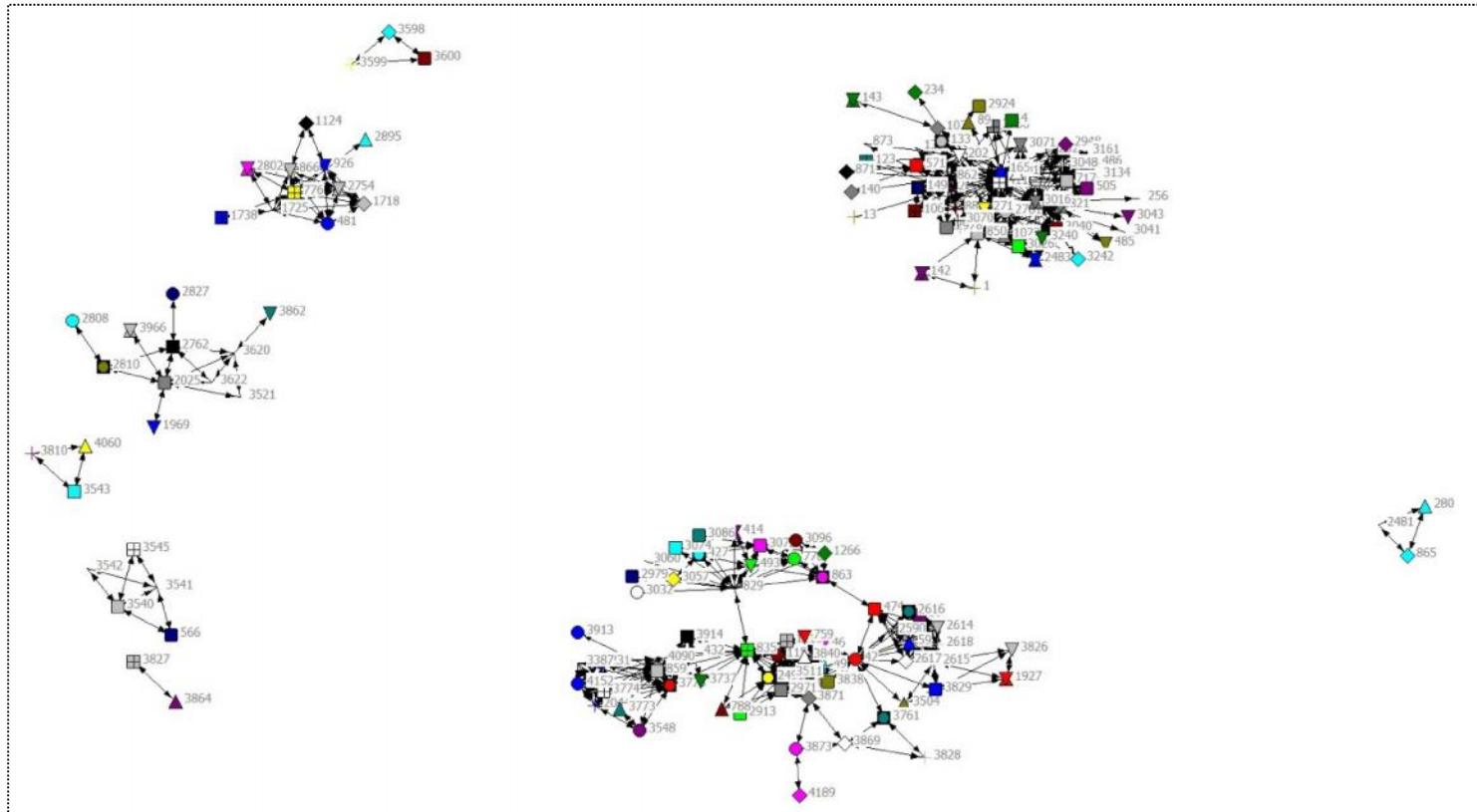


Figure 6.6. Netdraw: witnesses to H2 documents, >7 co-witnessing instances

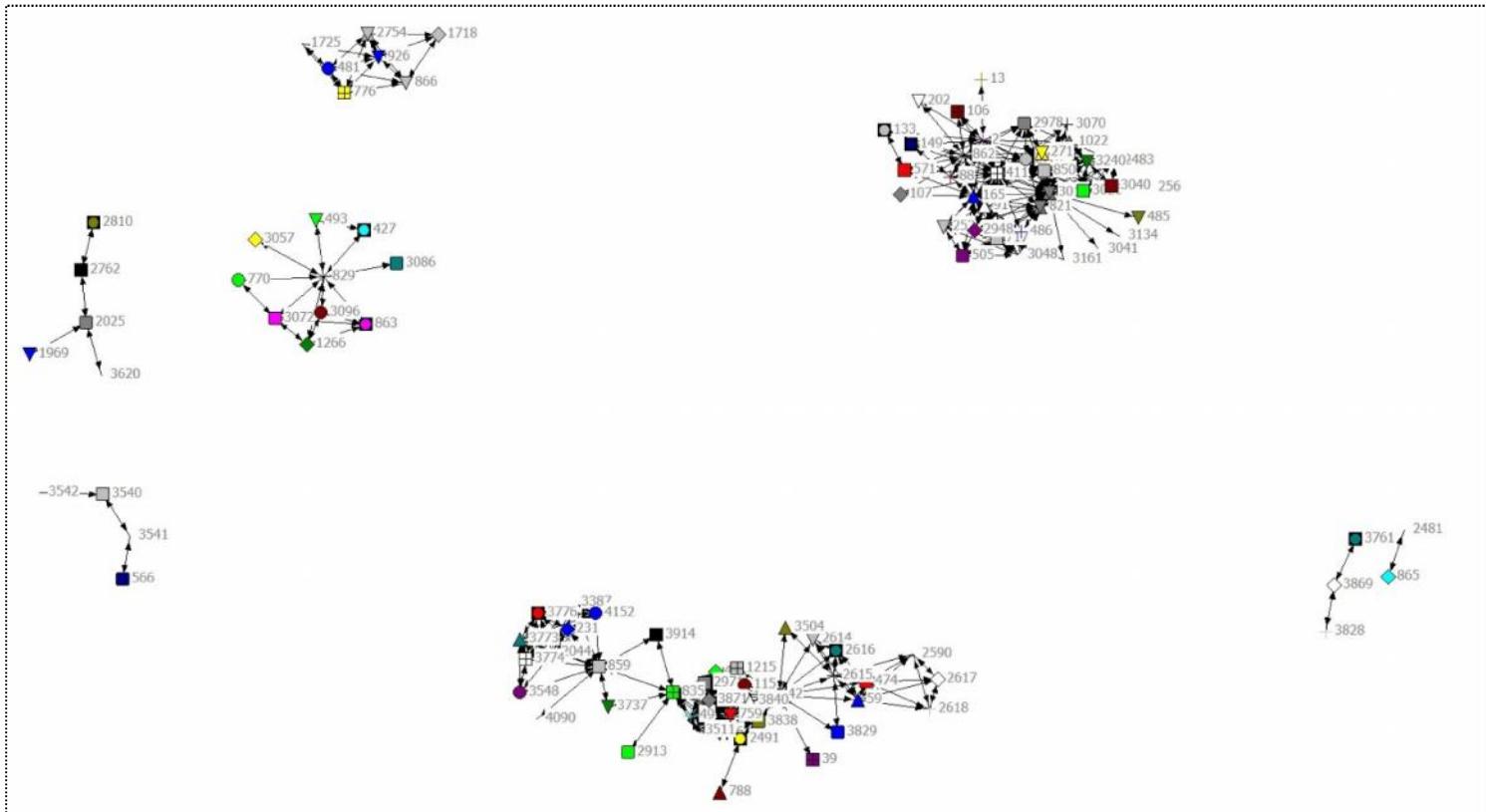


Figure 6.7. Netdraw: witnesses to H2 documents, >10 co-witnessing acts

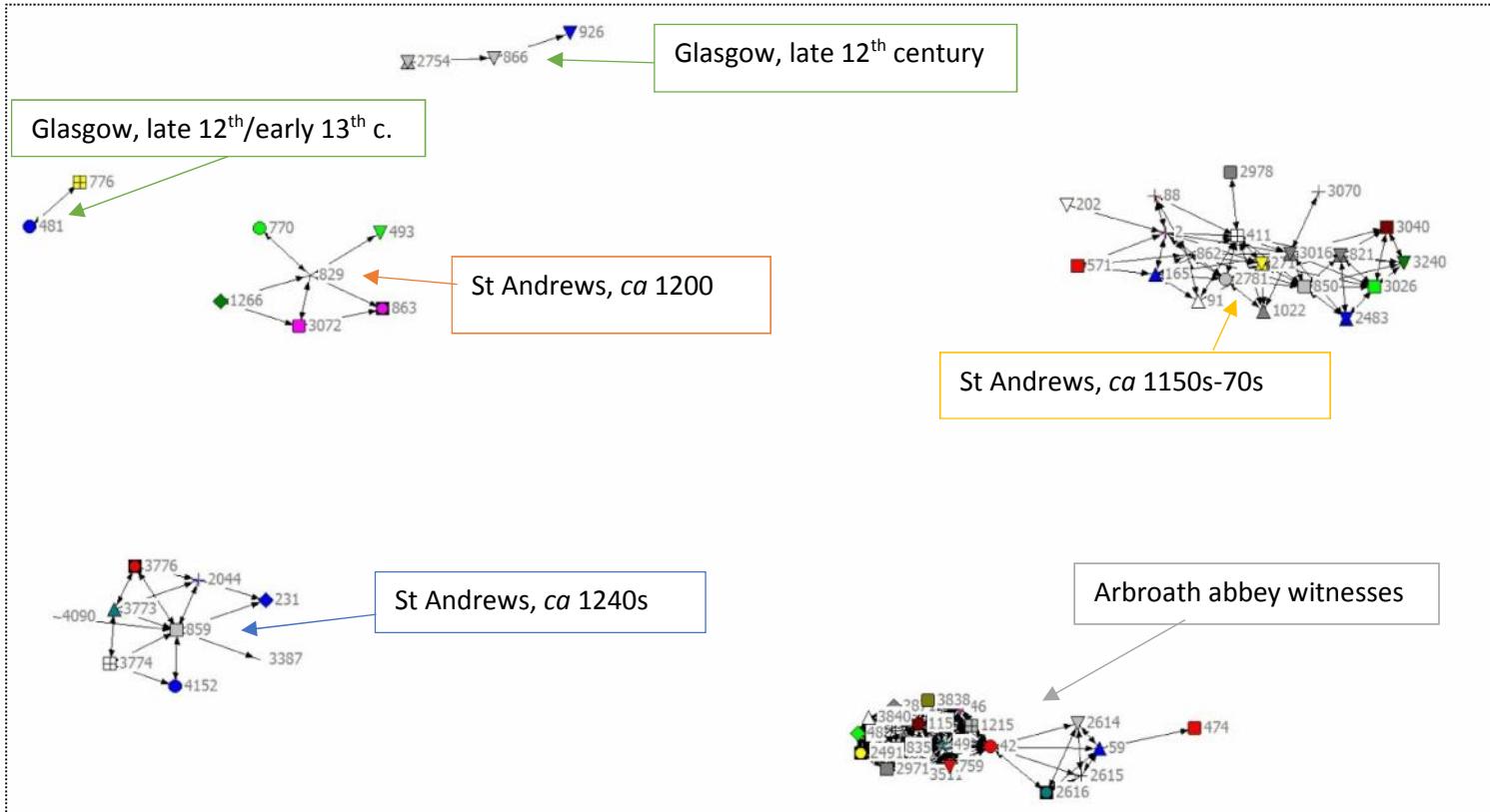


Figure 6.8. Netdraw: witnesses to H2 documents, >12 co-witnessing acts

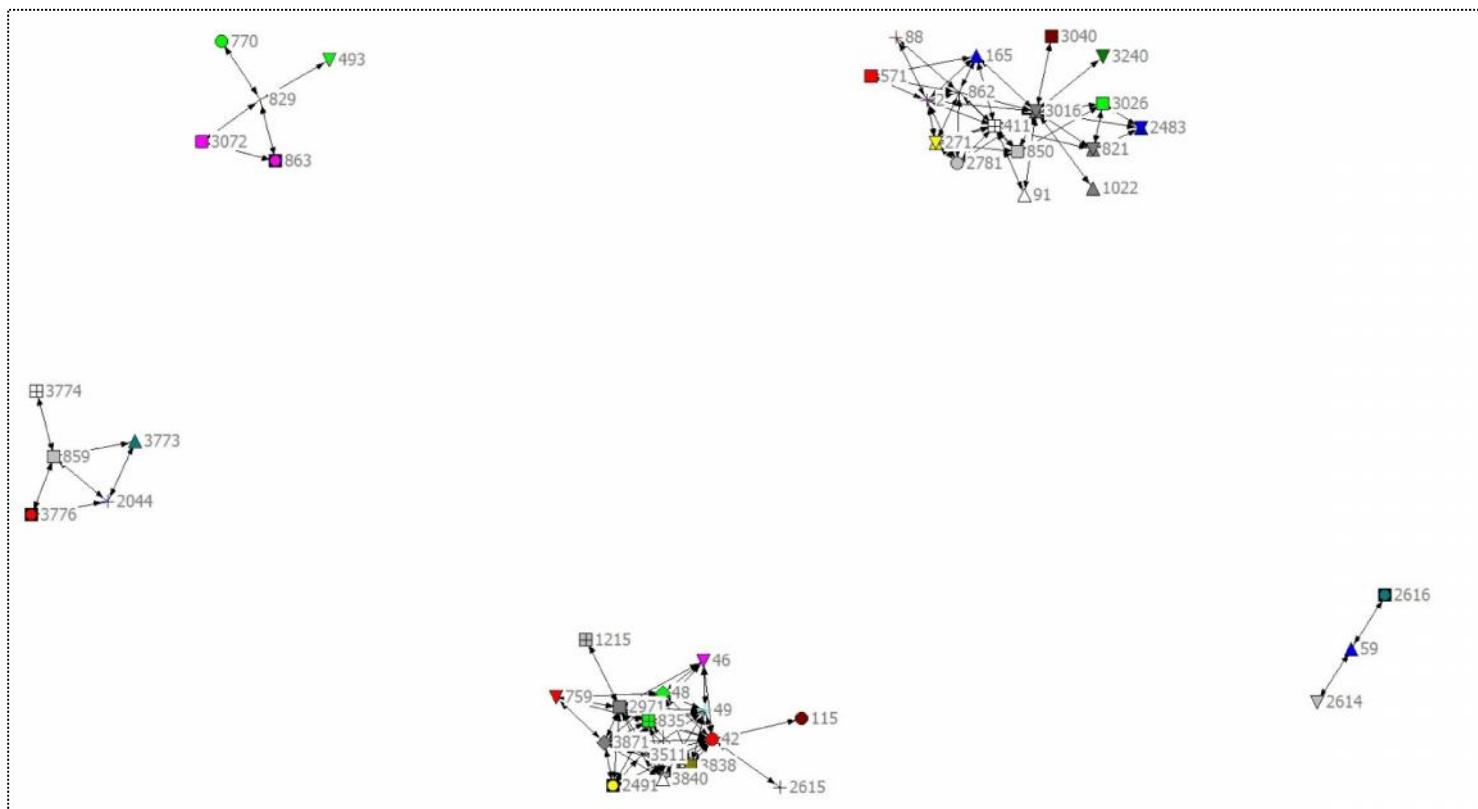


Figure 6.9. Netdraw: witnesses to H2 documents, >15 co-witnessing acts

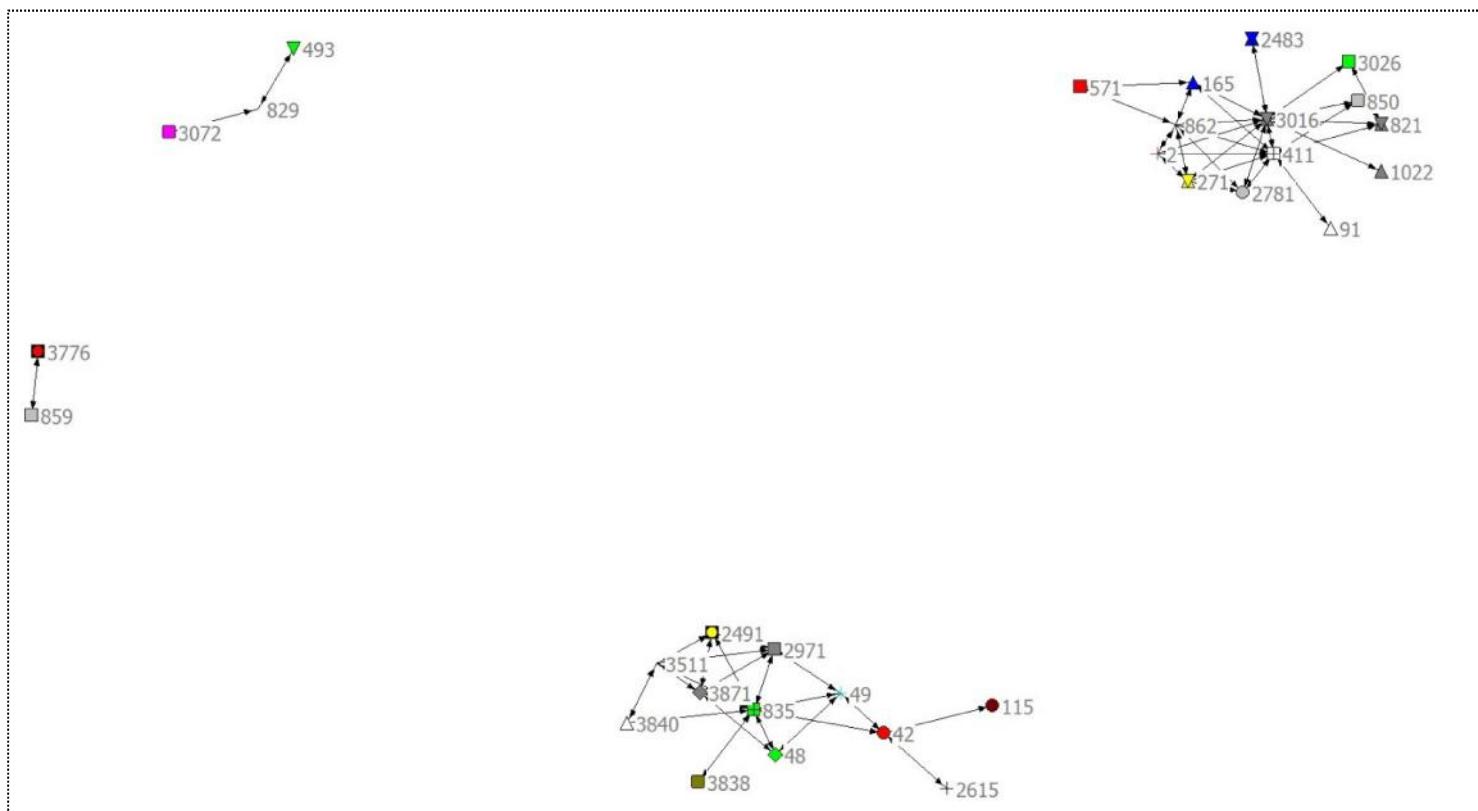


Figure 6.10. Netdraw: witnesses to H2 documents, >17 co-witnessing acts

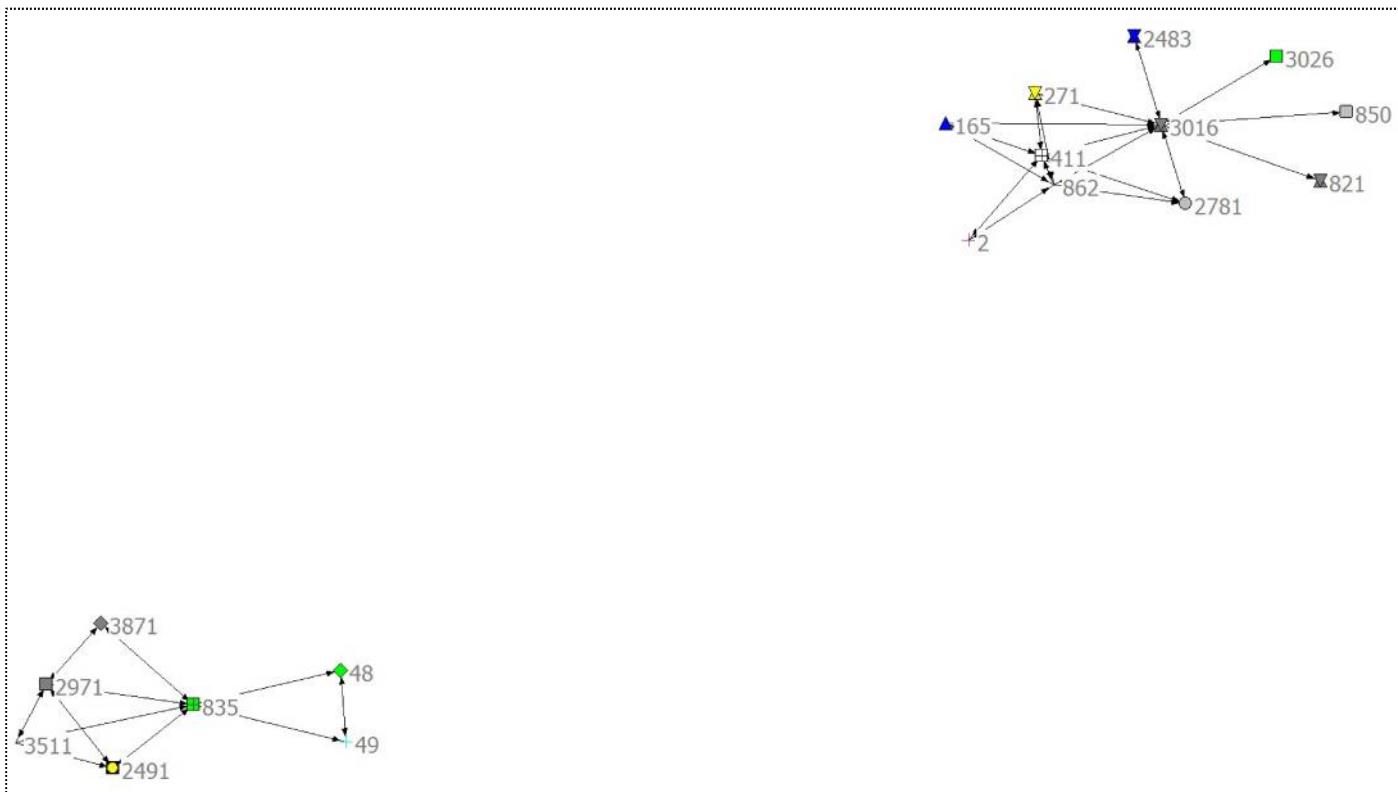


Figure 6.11. Netdraw: witnesses to H2 documents, >20 co-witnessing acts

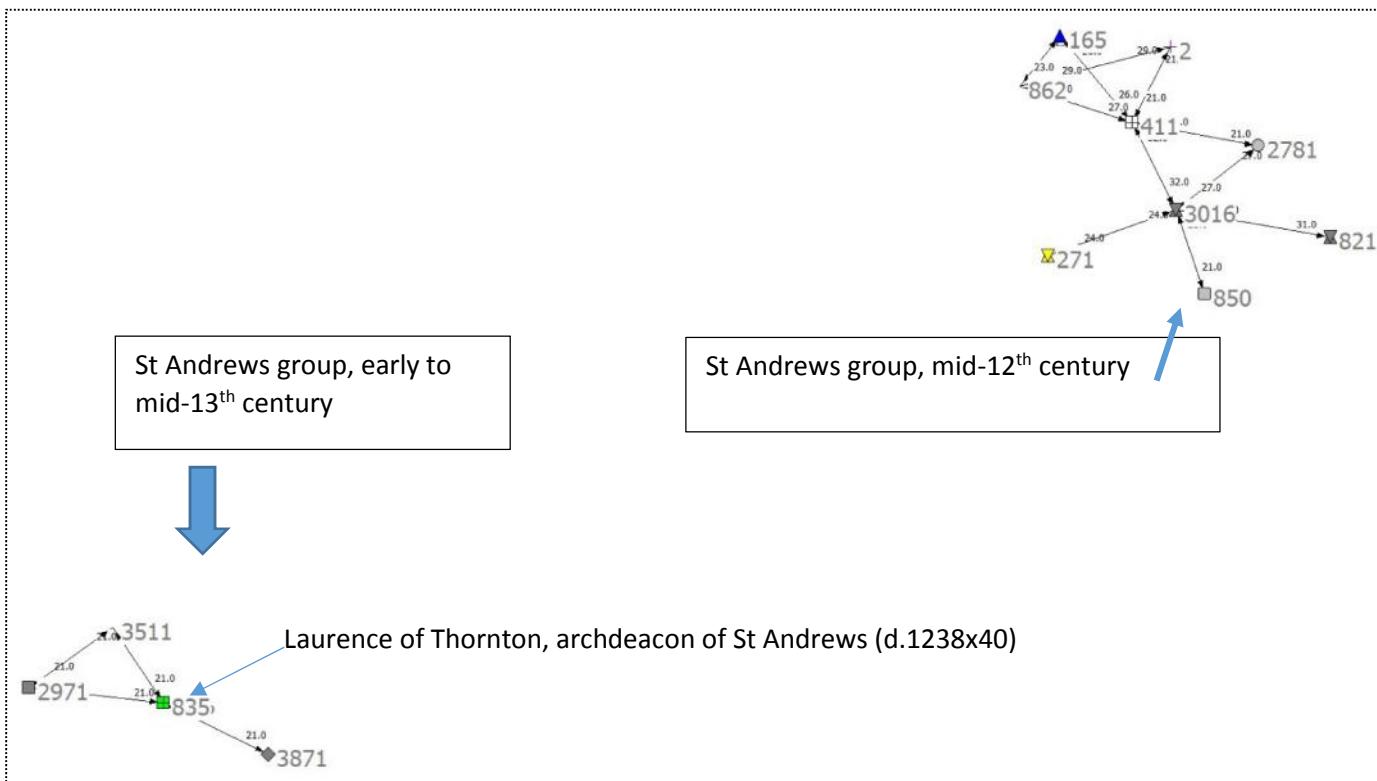


Figure 6.12. Netdraw: witnesses to H2 documents, >21 co-witnessing acts

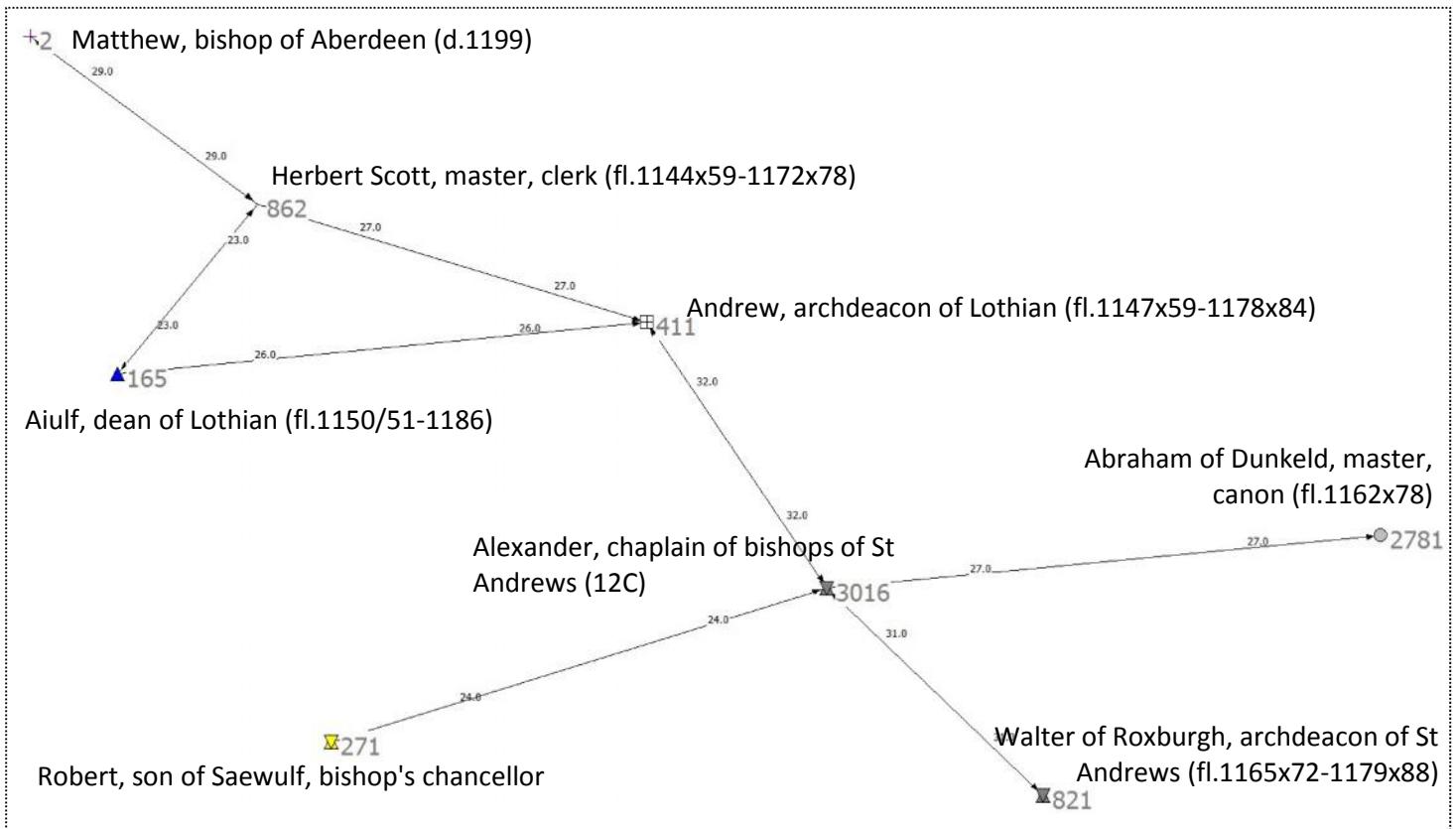


Figure 6.13. Netdraw: witnesses to H2 documents, >25 co-witnessing acts

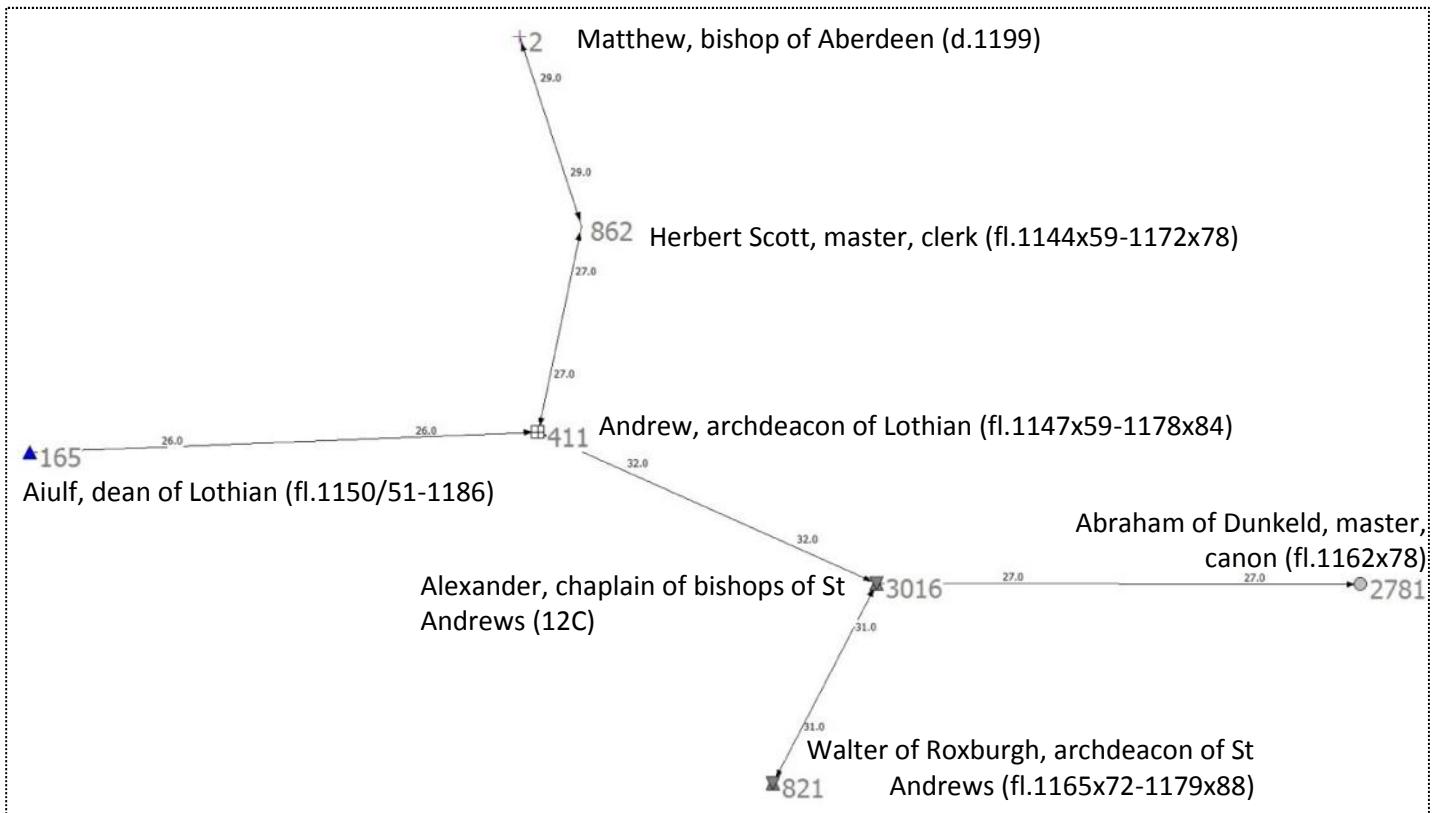


Figure 6.14. Netdraw: witnesses to H2 documents, >30 co-witnessing acts

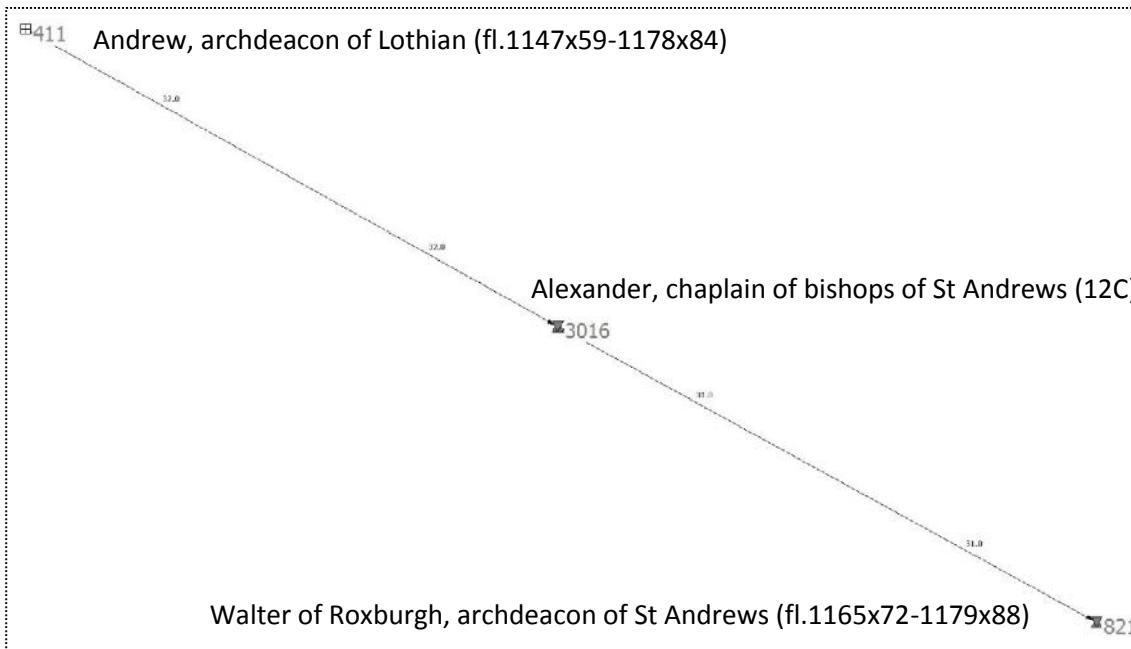


Table 6.2: Most productive co-witnessing 'relationships' (H2)

Person 1	Person 2	# docs
Andrew, archdeacon of Lothian (fl.1147x59-1178x84)	Alexander, chaplain of bishops of St Andrews (12C)	32
Walter of Roxburgh, archdeacon of St Andrews (fl.1165x72-1179x88)	Alexander, chaplain of bishops of St Andrews (12C)	31
Matthew, bishop of Aberdeen (d.1199)	Herbert Scott, master, clerk (fl.1144x59-1172x78)	29
Andrew, archdeacon of Lothian (fl.1147x59-1178x84)	Herbert Scott, master, clerk (fl.1144x59-1172x78)	27
Abraham of Dunkeld, master, canon (fl.1162x78)	Alexander, chaplain of bishops of St Andrews (12C)	27
Andrew, archdeacon of Lothian (fl.1147x59-1178x84)	Aiulf, dean of Lothian (fl.1150/51-1186)	26
Robert, son of Saewulf, bishop's chancellor	Alexander, chaplain of bishops of St Andrews (12C)	24
Aiulf, dean of Lothian (fl.1150/51-1186)	Herbert Scott, master, clerk (fl.1144x59-1172x78)	23
Matthew, bishop of Aberdeen (d.1199)	Andrew, archdeacon of Lothian (fl.1147x59-1178x84)	21
Andrew, archdeacon of Lothian (fl.1147x59-1178x84)	Abraham of Dunkeld, master, canon (fl.1162x78)	21
John Scott, bishop of Dunkeld (d.1203)	Alexander, chaplain of bishops of St Andrews (12C)	21
Peter, chaplain and clerk of Bishop Malveisin	Laurence of Thornton, archdeacon of St Andrews (d.1238x40)	21
Peter, chaplain and clerk of Bishop Malveisin	Michael, master, clerk, chaplain (fl.1201-1220x25)	21
Laurence of Thornton, archdeacon of St Andrews (d.1238x40)	Edward Murray, master, canon, bishop's clerk	21
Laurence of Thornton, archdeacon of St Andrews (d.1238x40)	Michael, master, clerk, chaplain (fl.1201-1220x25)	21
Andrew, archdeacon of Lothian (fl.1147x59-1178x84)	Robert, son of Saewulf, bishop's chancellor	20
Peter, chaplain and clerk of Bishop Malveisin	Stephen of Lilliesleaf, master, clerk, persona	20
Herbert Scott, master, clerk (fl.1144x59-1172x78)	Robert, son of Saewulf, bishop's chancellor	20
Laurence of Thornton, archdeacon of St Andrews (d.1238x40)	Stephen of Lilliesleaf, master, clerk, persona	20

The table of the most productive co-witnessing ‘relationships’ reflects the predominance of evidence emanating from St Andrews in the mid-to-late twelfth century. As the above sociograms illustrate, all of the individuals who witnessed alongside each other more than twenty times did so in the context of the church of St Andrews. The chaplain Alexander, various archdeacons of St Andrews and of Lothian, and magistri like Herbert Scot and Abraham of Dunkeld were among the most frequent witnesses.

Table 6.3 (below) lists the top 20 witnesses according to degree centrality. These mostly reflect again the predominance of St Andrews material. Bishop Matthew of Aberdeen, archdeacon of St Andrews from around 1150 to 1172, was connected to 233 other contacts, and was one of the most central individuals in the database as a whole. John Scot was his relative and an unsuccessful nominee for the episcopate in 1178: he later served as bishop of Dunkeld for about two decades. The list again demonstrates the key position of archdeacons, with Ranulf de Wat, Andrew, Thorald, Walter of Roxburgh, and Laurence of Thornton all present on the list. Not all central individuals were St Andrews churchmen themselves: Duncan (II) earl of Fife, the chancellor William del Bois, and Andrew bishop of Caithness, all men with high centralities in the sociogram of all witnesses to the database, witnessed a number of ecclesiastical charters as well as the royal charters we tend to associate them with.

Table 6.3. Top 20 witnesses by degree

poms id	name	degree
2	Matthew, bishop of Aberdeen (d.1199)	233
850	John Scott, bishop of Dunkeld (d.1203)	184
829	Ranulf de Wat, archdeacon of St Andrews (d.1209)	179
3016	Alexander, chaplain of bishops of St Andrews (12C)	178
411	Andrew, archdeacon of Lothian (fl.1147x59-1178x84)	171
165	Aiulf, dean of Lothian (fl.1150/51-1186)	163
13	Duncan (II), earl of Fife (d.1204)	160
862	Herbert Scott, master, clerk (fl.1144x59-1172x78)	145
571	Thorald, archdeacon of Lothian (d.1163 or 1166)	140
493	John of Leicester, bishop of Dunkeld (d.1214)	139
271	Robert, son of Saewulf, bishop's chancellor	137
42	William del Bois, chancellor (d.1232)	133
202	Andrew, bishop of Caithness (d.1184)	129
821	Walter of Roxburgh, archdeacon of St Andrews (fl.1165x72-1179x88)	127
2781	Abraham of Dunkeld, master, canon (fl.1162x78)	126
1022	Odo of Kinninmonth, steward, marischal (d.c.1195)	125
2971	Peter, chaplain and clerk of Bishop Malveisin	120
863	Isaac Scott, master, clerk	119
835	Laurence of Thornton, archdeacon of St Andrews (d.1238x40)	114
776	John of Huntingdon, master, official of Glasgow (fl.1179x1208)	112

Table 6.4 lists the top twenty witnesses according to eigenvector centrality. In addition to having the most contacts (degree), Bishop Matthew of Aberdeen also sets the benchmark in terms of number of high-degree contacts (eigenvector). Bishop John Scot also comes in second here, with an eigenvector score of about 93%, but Earl Duncan II of Fife is number three, with an eigenvector score of 86.7%. So even though his co-witnessing contacts were fewer than Ranulf de Wat or Alexander the chaplain, the individuals with whom he co-witnessed were themselves more central players. This is likely because Earl Duncan would have witnessed at more large assemblies, while St Andrews insiders like Alexander the chaplain would have witnessed more workaday charters in St Andrews. Another point to note is the presence of heads of religious houses and bishops in the 50-60% range. Abbots of Dunfermline and Holyrood and bishops of Dunkeld probably witnessed fewer charters than many others, but these would have likewise been alongside the more prominent power players in the kingdom and the church.

Table 6.4. Top 20 witnesses by eigenvector

Person ID	Name	Eigenvector Centrality
2	Matthew, bishop of Aberdeen (d.1199)	1
850	John Scott, bishop of Dunkeld (d.1203)	0.929662
13	Duncan (II), earl of Fife (d.1204)	0.867203
411	Andrew, archdeacon of Lothian (fl.1147x59-1178x84)	0.795135
3016	Alexander, chaplain of bishops of St Andrews (12C)	0.753157
165	Aiulf, dean of Lothian (fl.1150/51-1186)	0.745829
829	Ranulf de Wat, archdeacon of St Andrews (d.1209)	0.74413
202	Andrew, bishop of Caithness (d.1184)	0.687737
271	Robert, son of Saewulf, bishop's chancellor	0.684757
862	Herbert Scott, master, clerk (fl.1144x59-1172x78)	0.684217
1022	Odo of Kinninmonth, steward, marischal (d.c.1195)	0.65434
571	Thorald, archdeacon of Lothian (d.1163 or 1166)	0.632719
2978	Stephen, clerk (St Andrews)	0.623444
2781	Abraham of Dunkeld, master, canon (fl.1162x78)	0.621941
493	John of Leicester, bishop of Dunkeld (d.1214)	0.610516
91	Geoffrey, abbot of Dunfermline (d.1178)	0.568139
419	Archibald, abbot of Dunfermline (d.1198)	0.56331
149	Gregory, bishop of Dunkeld (d.1169)	0.561574
1	William I, king of Scots (d.1214)	0.554306
88	William, abbot of Holyrood (I) (d.1172)	0.545819

PART TWO: NETWORK OF ALL LAY (H3) GRANTORS

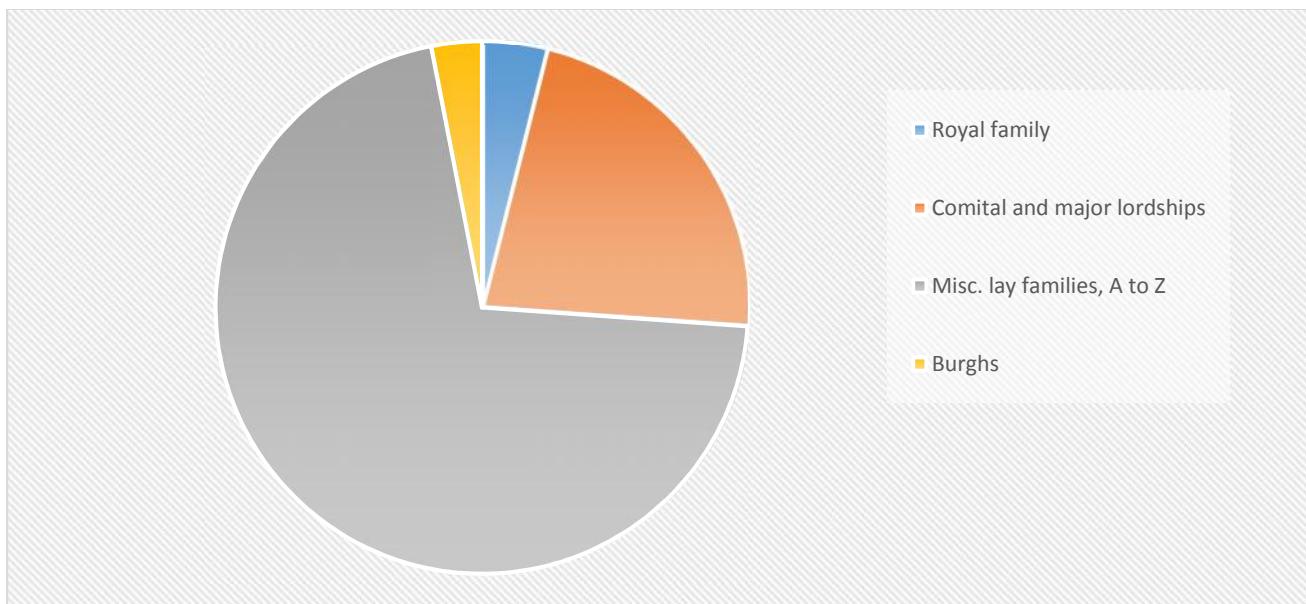
The Social Network Analysis of all lay documents includes 1868 documents, 6893 witnesses, and 66,844 edges. This study is based on the five specified document types in sources with an H-number beginning with 3. Of the 1868 documents, 6 are notifications, one is a charter/brieve, one is an agreement, and 1859 are charters strictly speaking. Table 6.5, below, shows the comparative size of the datasets of royal, ecclesiastical, and lay documents. Despite that the H2 dataset comprised a third fewer documents than the H1 dataset, there are nearly twice as many witnesses in the H2 dataset. Another way of looking at this is that there are three times as many average witnesses per document in the H2 dataset than the H1. This is because there is a much smaller core of royal charter witnesses who appear again and again, while in H2, where there are many different series of charter grantors (e.g. bishops of St Andrews, Glasgow, Aberdeen; abbots of Dunfermline, Melrose, Arbroath, etc.), and thus many more distinct witnesses appear. As far as the lay documents go, the dataset is much larger: there are about twice as many documents as in H1, and about three times as many as in H2. There are also far more distinct witnesses, nearly 6900. This is over three times as many witnesses as in ecclesiastical documents and over six times as many witnesses as in royal documents. With a multitude of different lay grantors and social contexts in H3, it should not be surprising that there are so many individuals appearing as witnesses.

Table 6.5. Comparison of datasets (5 specified document types): royal, ecclesiastical, and private

H	Grantor category	# docs	# witnesses	# edges	Witness/doc
H1	Royal grantors	935	1039	16,059	1.11
H2	Ecclesiastical grantors	608	2009	19,757	3.3
H3	Lay grantors	1868	6893	66,844	3.69
H4	Two-sided documents	194	1412	13,692	7.28

Of the 1868 documents, 1859 (99.5%) are charters, while only six were notifications, two were charter/brieves, and one was classified as an agreement but was written as a statement in the name of a lay individual (3/327/1). 73 documents (4%) were issued by members of the royal family, 415 (22%) were documents of the comital families and holders of major territorial lordships, such as lords of Galloway, the majority – 1323 or 71% - were charters of a random variety of other lay landholders, and 57 were burgh charters (or three percent).

Figure 6.15. H3 lay documents by grantor category



The three tables below show the top twenty witnesses to H3 documents according to betweenness, degree, and eigenvector centralities. The betweenness centrality list reveals a mix of top lay and church figures. On the lay side, the emphasis is on familiar earls of Fife and Dunbar, as well as justiciars like Walter Oliphant. Perhaps surprisingly, many top church figures also witnessed these lay charters, including the chancellor William del Bois (it is noteworthy that as the person with the highest betweenness in the whole study of all witnesses, William's high betweenness is evident in H1, H2, and H3 studies), as well as bishops of St Andrews, Glasgow, and Moray. The chronological tilt of this dataset is later than those we have examined so far, and Duncan (II) earl of Fife (d.1204) and Jocelin, bishop of Glasgow (d. 1199) are the only twelfth-century figures with high betweenness rankings. Earl Duncan's predominant position in this study helps explain his remarkable, almost unique position in the database as a whole. He holds the top position in terms of all three types of centrality. With a degree of 318, his group of contacts is greater than 60 more than the next most central person. Earl Duncan's connection with so many witnesses to lay documents in addition to royal charter witness, coupled with a respectably high centrality among H2 documents, shows the breadth of social contexts and individuals with whom he had contact.

The large body of texts relating to the holdings of Coldingham priory are very evident in this study, and prominent witnesses from this corpus have been given in italics in the tables below. Four of the twenty most central by degree, and five of the twenty most central by eigenvector are part of this Coldingham group. Alan son of Cospatric of Swinton has an eigenvector score of 94%, which is a

testament to the richness of the Coldingham corpus rather than an indicator of importance on the national stage. It is advisable to consider the Coldingham players and the other actors separately. Further, the study of the H3 documents in the 'Scotland proper dataset' in chapter 7 allows an examination of lay charter witnesses unencumbered by the Coldingham material. Fife and Lothian/Dunbar are two earldoms and provinces which are well-represented in the study. The case study of the acts of the earls of Dunbar, presented later in this chapter, helps explain the significance of Patrick (I), earl of Dunbar (d.1232), William, son of Earl Patrick (I) (d.1253), and Roger de Merlay (II) (d.c.1239). Charters of the Stewart family, earls of Lennox, and others in the area of Glasgow help explain the centrality of two bishops of Glasgow and one archdeacon, as well as the Stewart vassal Robert Crook. Otherwise, many of the central individuals were also top players in the analysis of royal charter witnesses. This includes the highly connected (among royal documents and all documents) group of Earl Duncan (II) of Fife, Philip de Valognes, the chamberlain, and Gilbert earl of Strathearn.

Table 6.6. Top twenty witnesses by betweenness centrality (H3)

Name	Betweeness
Duncan (II), earl of Fife (d.1204)	757128.2
William del Bois, chancellor (d.1232)	740314.2
William Malveisin, bishop of St Andrews (d.1238)	699880.3
Malcolm (I), earl of Fife (d.1229)	562236.2
Patrick (I), earl of Dunbar (d.1232)	511571.5
Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	504928.6
Jocelin, bishop of Glasgow (d.1199)	479103.5
Walter Stewart, earl of Menteith (d.c.1293)	418331
John Hay (I), lord of Naughton (d.xOct.1266)	396605.6
William, son of Earl Patrick (I) (d.1253)	394386.9
Andrew Murray, bishop of Moray (d.1242)	383414.8
Bernard of Hadden, sheriff of Roxburgh	378030.1
David, earl of Huntingdon (d.1219)	370320
Walter Stewart (II), son of Alan (d.1241)	359729.3
Adam of Makerstoun, master, provost (d.1280x86)	358100.6
Roger de Merlay (II) (d.c.1239)	349409.6
John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	340296.7
Walter of St Albans, bishop of Glasgow (d.1232)	339354.3
<i>Alan, son of Cospatric of Swinton</i>	338024.1
Henry, son of Geoffrey de Liberatione of Perth	336389.2

Table 6.7. Top twenty witnesses by degree centrality (H3)

PoMS ID	Name	Degree
13	Duncan (II), earl of Fife (d.1204)	318
745	Jocelin, bishop of Glasgow (d.1199)	254
42	William del Bois, chancellor (d.1232)	250
1287	<i>Alan, son of Cospatric of Swinton</i>	233
782	Malcolm (I), earl of Fife (d.1229)	226
142	David, earl of Huntingdon (d.1219)	221
40	William Malveisin, bishop of St Andrews (d.1238)	217
1285	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	204
2115	Walter Lindsay (III), son of William (II) (d.c.1222)	193
444	Patrick (I), earl of Dunbar (d.1232)	192
3149	<i>Patrick, son of Adam son of Aldan the steward</i>	185
880	Bernard of Hadden, sheriff of Roxburgh	182
858	Walter of St Albans, bishop of Glasgow (d.1232)	179
866	Simon, archdeacon of Glasgow (fl.1165x74-1195x96)	179
16019	Robert Crook, knight (12C)	174
15	Philip de Valognes, chamberlain (d.1215)	173
5323	<i>Elias of Prenderguest</i>	172
445	Patrick (II), earl of Dunbar (d.1248)	164
5781	Roger de Merlay (II) (d.c.1239)	163
5423	<i>Henry of Prenderguest (I)</i>	163

Table 6.8. Top twenty witnesses by eigenvector centrality (H3)

Poms ID	Witness	Eigenvector
13	Duncan (II), earl of Fife (d.1204)	1
1287	<i>Alan, son of Cospatric of Swinton</i>	0.942172
142	David, earl of Huntingdon (d.1219)	0.921498
42	William del Bois, chancellor (d.1232)	0.836456
745	Jocelin, bishop of Glasgow (d.1199)	0.835934
782	Malcolm (I), earl of Fife (d.1229)	0.806899
3149	<i>Patrick, son of Adam son of Aldan the steward</i>	0.775714
2115	Walter Lindsay (III), son of William (II) (d.c.1222)	0.770019
40	William Malveisin, bishop of St Andrews (d.1238)	0.767788
444	Patrick (I), earl of Dunbar (d.1232)	0.765531
1285	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	0.718511
5423	<i>Henry of Prenderguest (I)</i>	0.717066
858	Walter of St Albans, bishop of Glasgow (d.1232)	0.702635
15	Philip de Valognes, chamberlain (d.1215)	0.697596
5323	<i>Elias of Prenderguest</i>	0.686796
445	Patrick (II), earl of Dunbar (d.1248)	0.665752
798	Richard de Prebenda, bishop of Dunkeld (d.1210)	0.649437
5312	<i>Adam of Little Reston</i>	0.640545
6177	<i>Elias of Ayton (father of John)</i>	0.626034
260	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	0.623787

Figure 6.16. Netdraw: witnesses to H3 documents

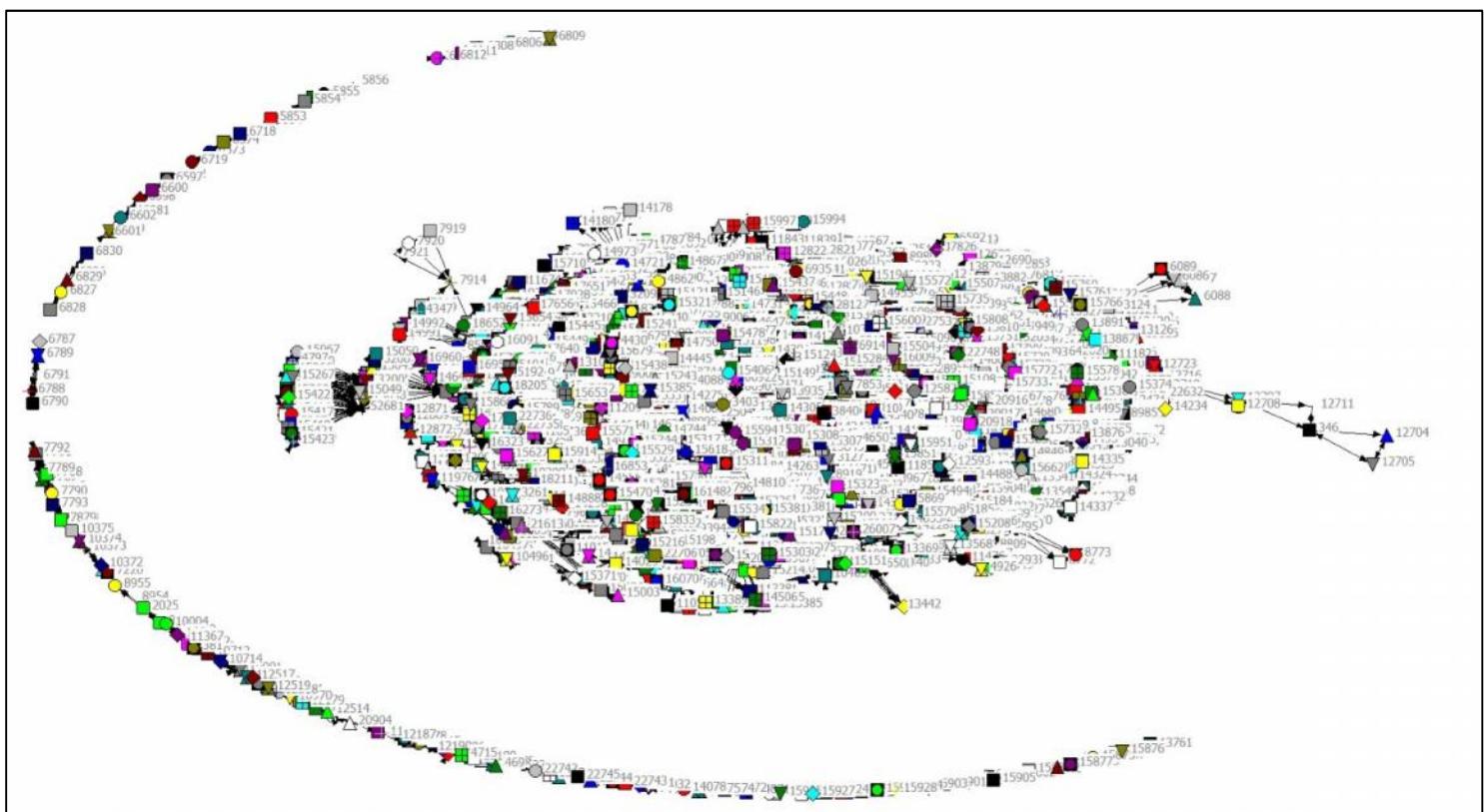


Figure 6.17. Netdraw: witnesses to H3 documents, >3 co-witnessing instances

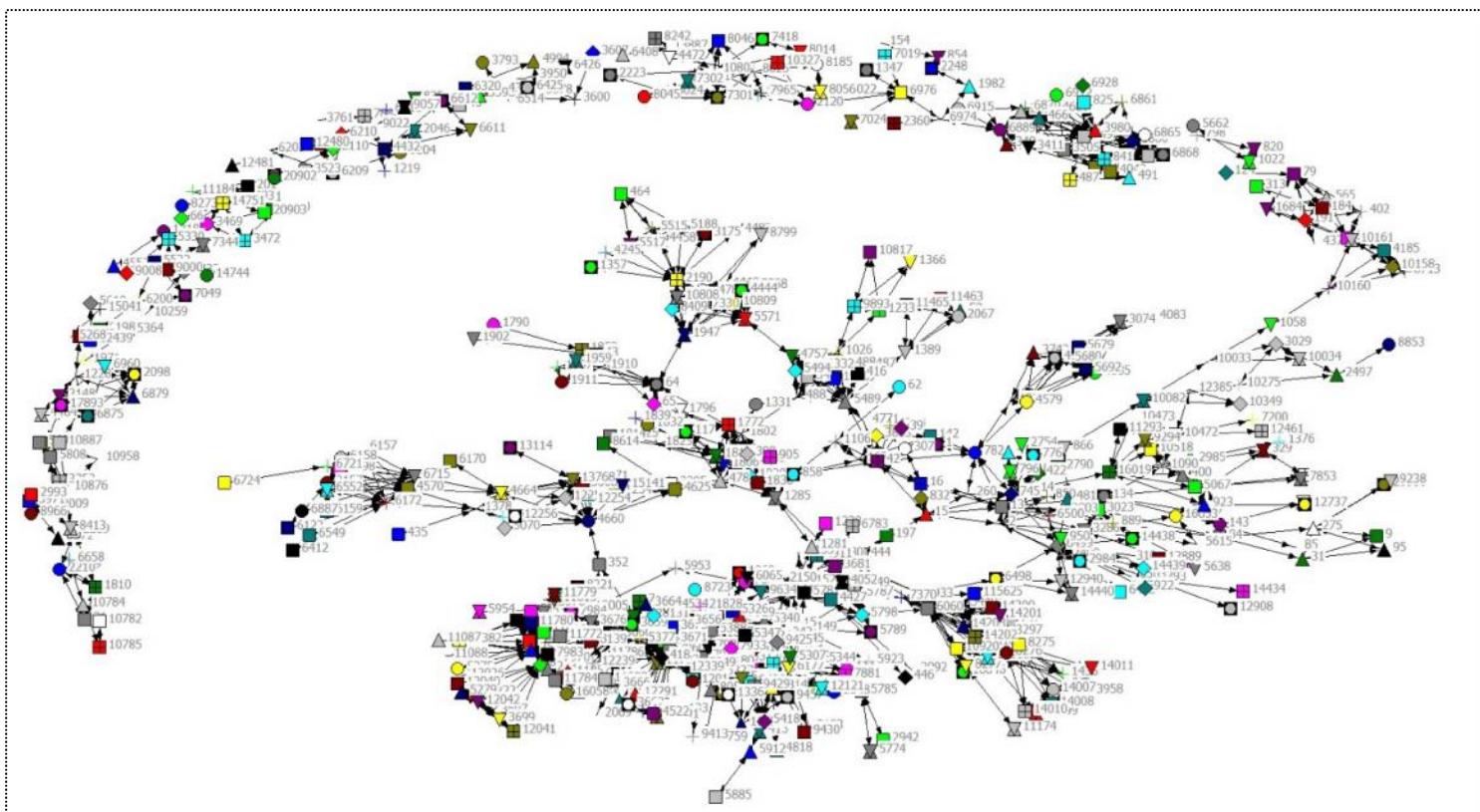


Figure 6.18. Netdraw: witnesses to H3 documents, >5 co-witnessing instances

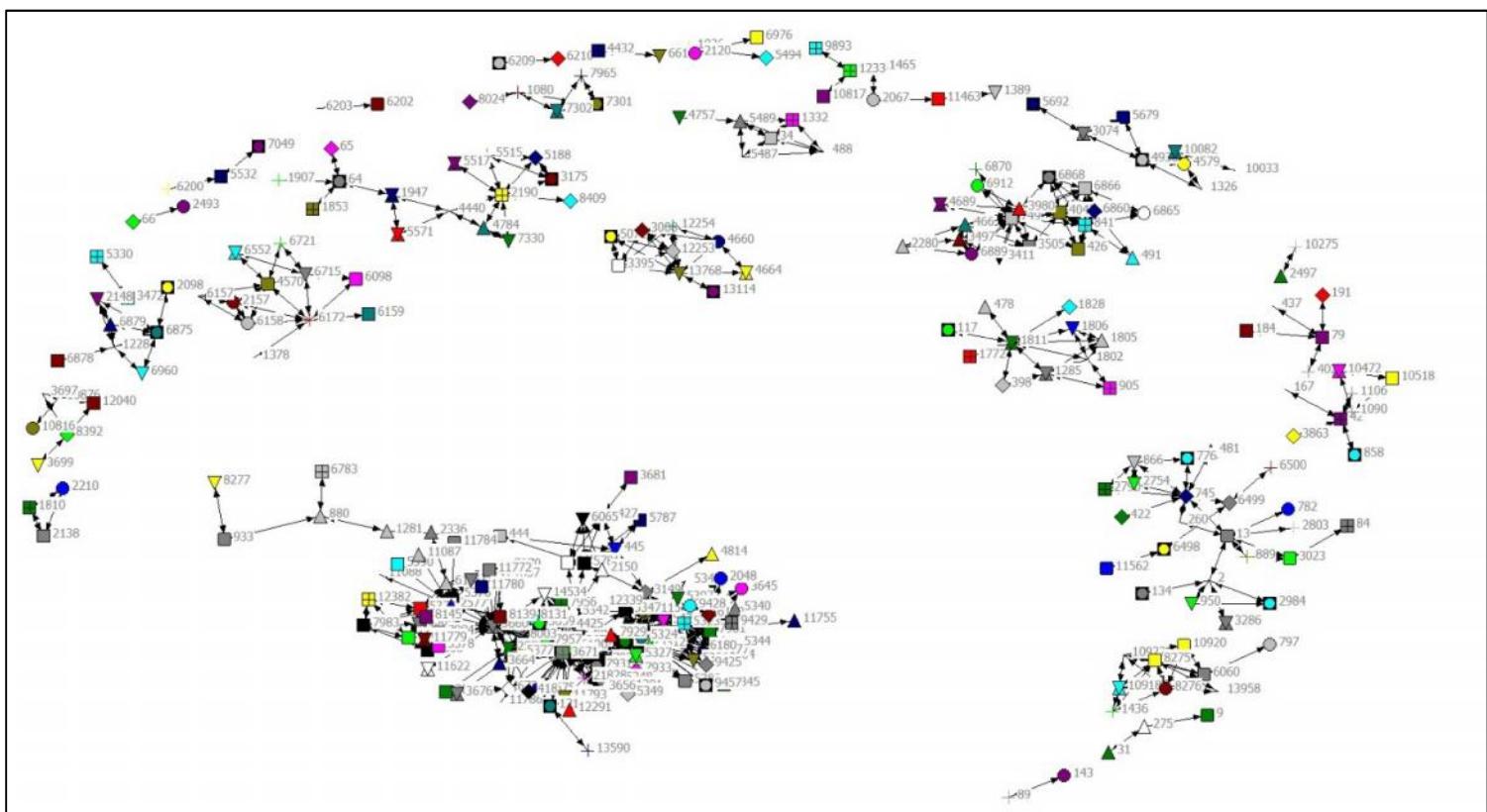


Figure 6.19. Netdraw: witnesses to H3 documents, >8 co-witnessing instances

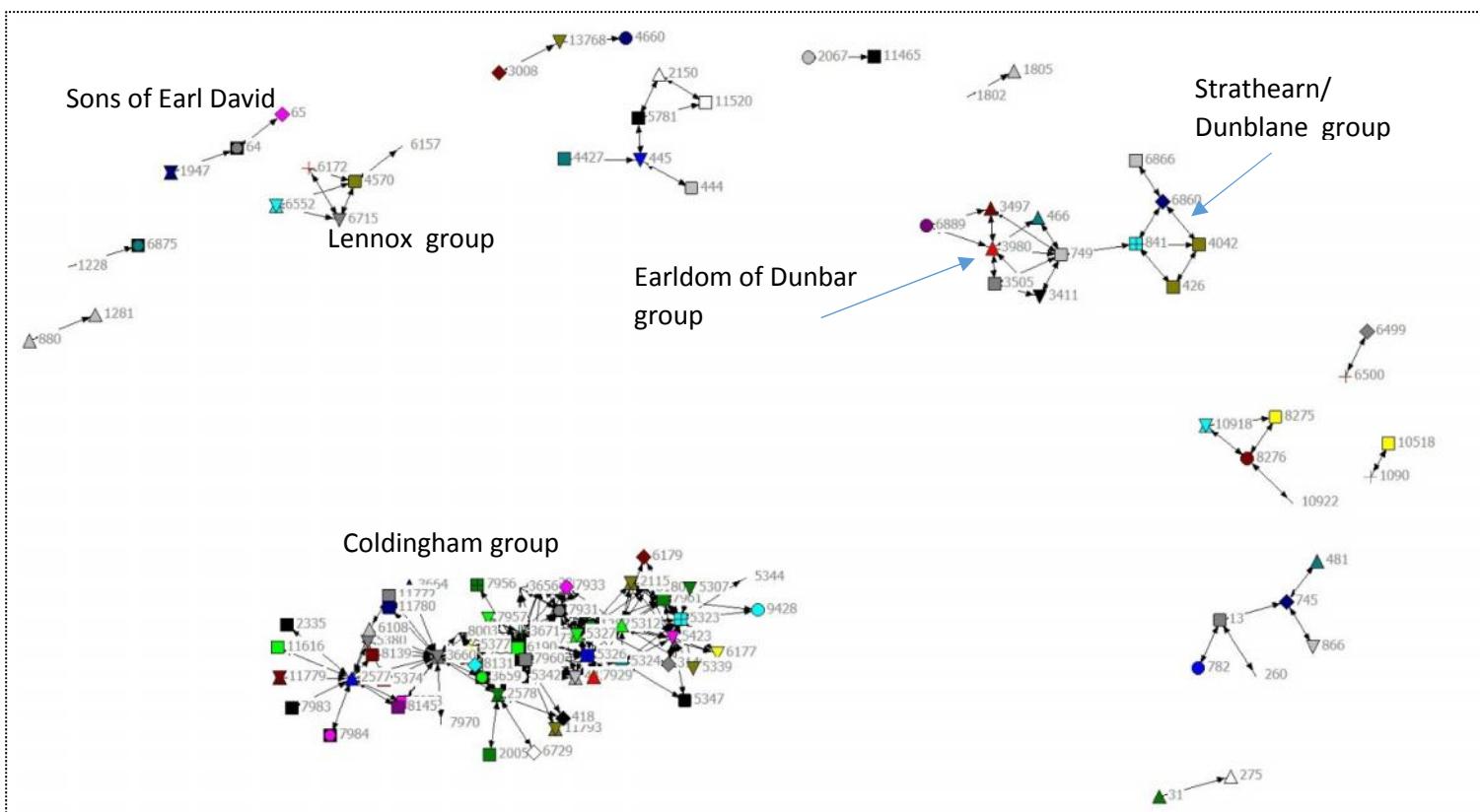


Figure 6.20. Netdraw: witnesses to H3 documents, >10 co-witnessing instances

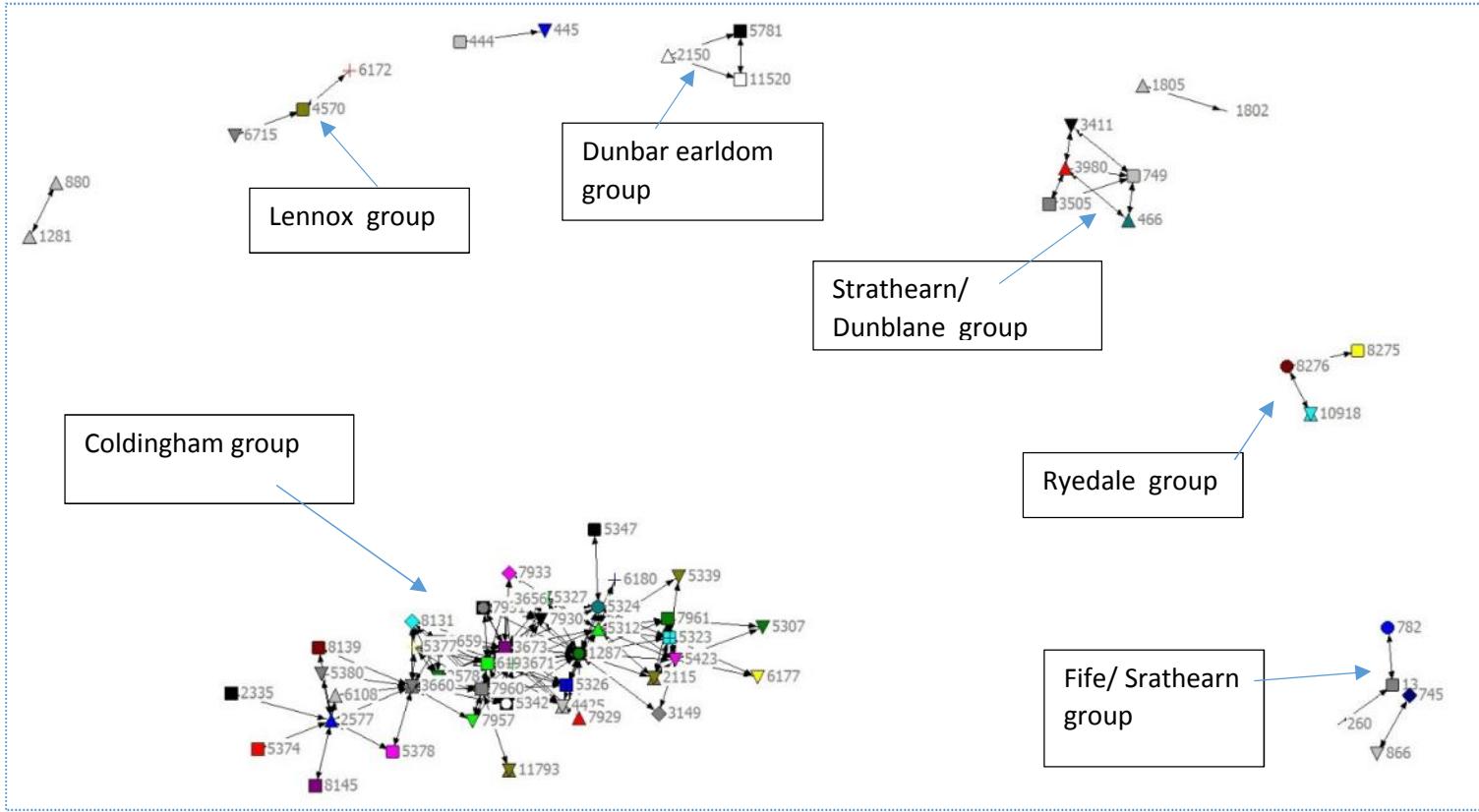


Figure 6.21. Netdraw: witnesses to H3 documents, >13 co-witnessing instances

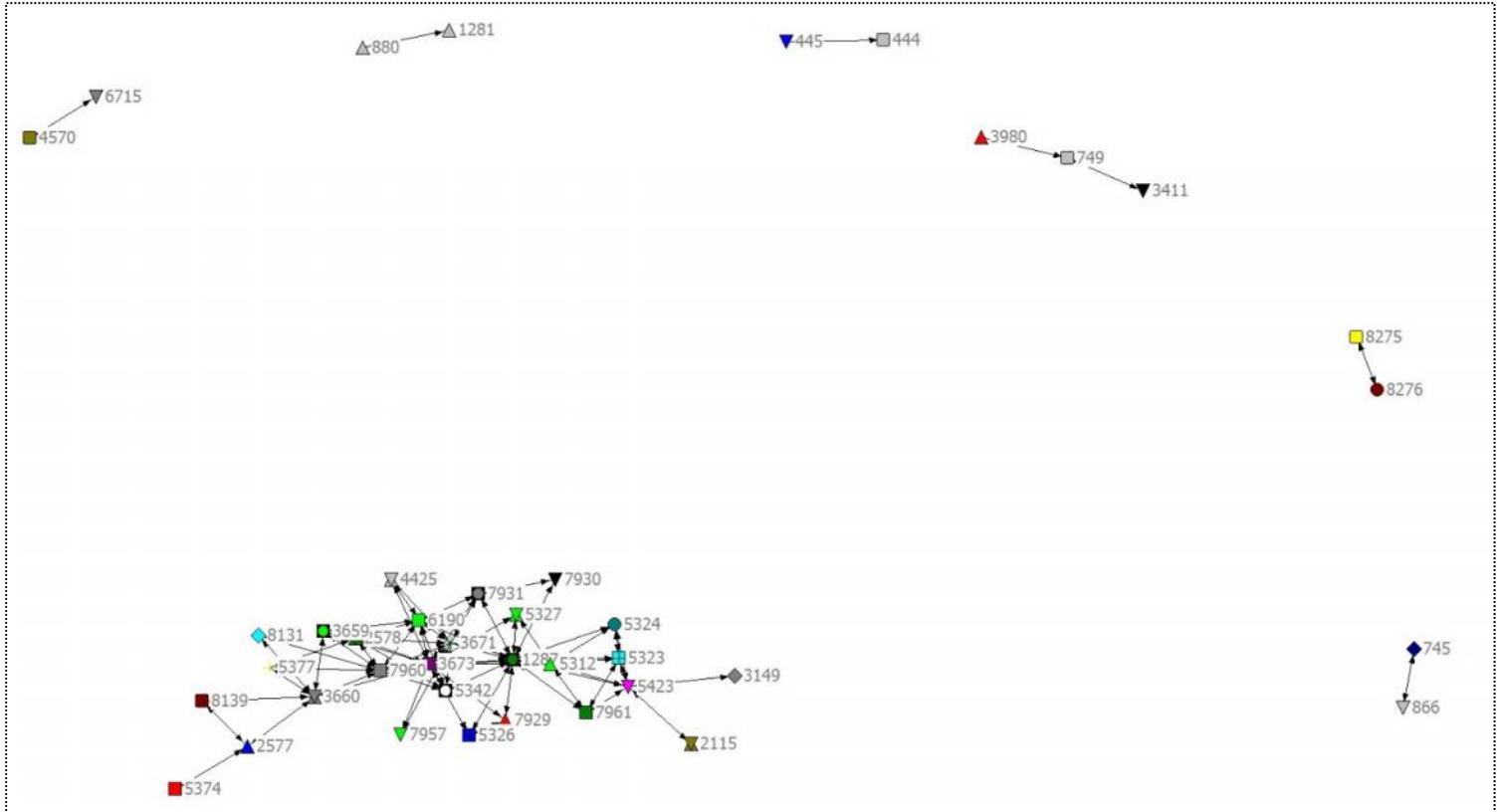


Figure 6.22. Netdraw: witnesses to H3 documents, >15 co-witnessing instances

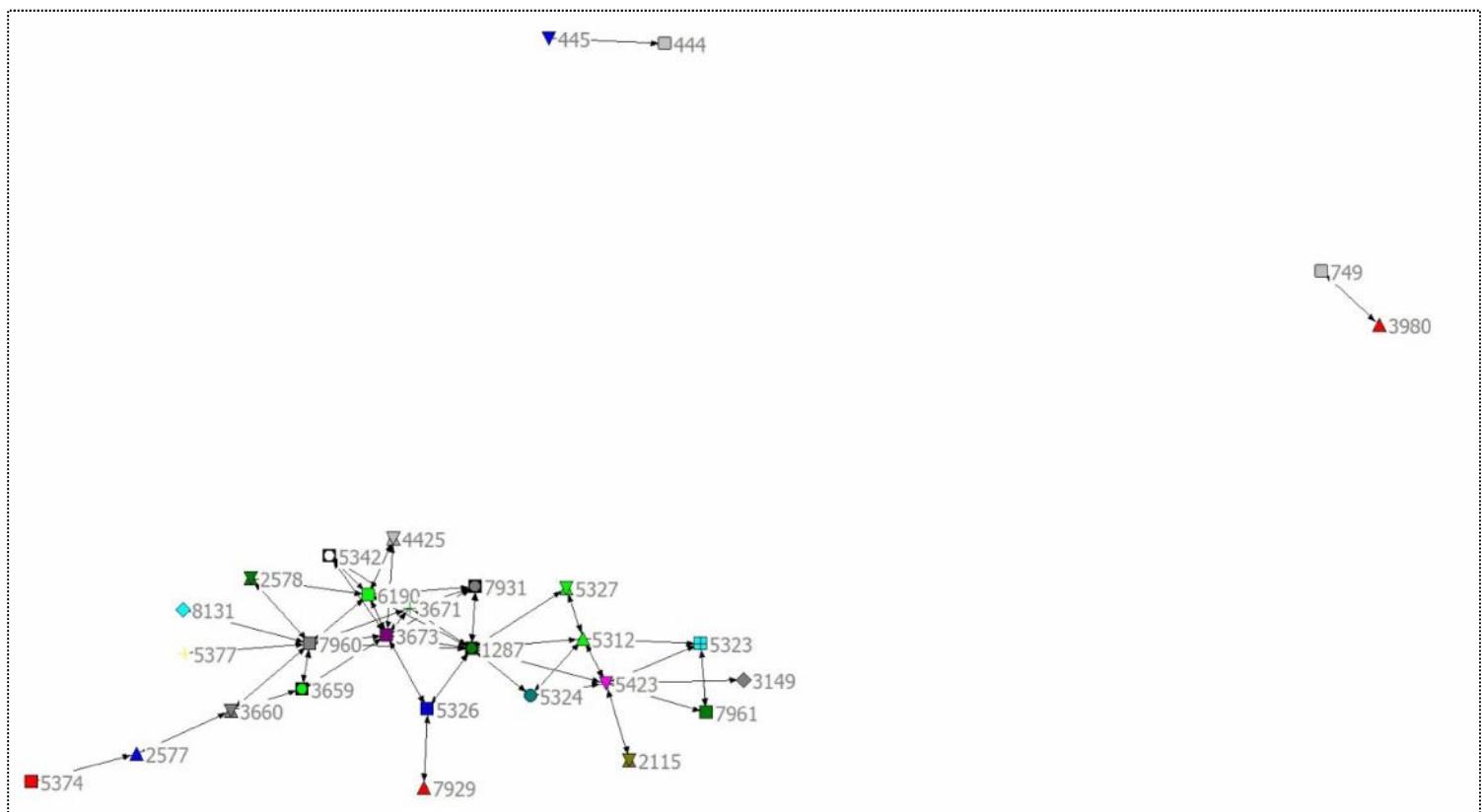


Figure 6.23. Netdraw: witnesses to H3 documents, >18 co-witnessing instances

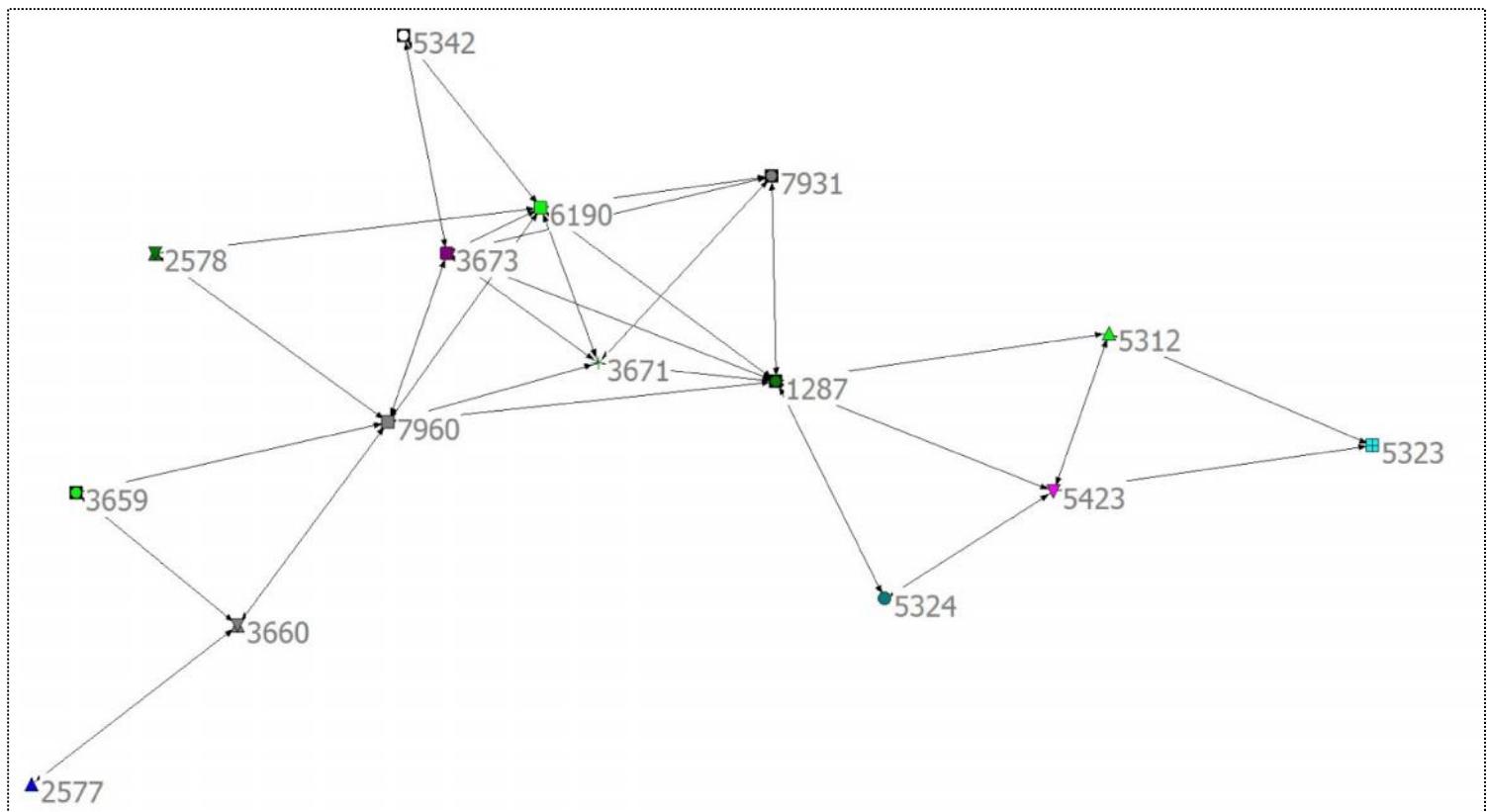


Figure 6.24. Netdraw: witnesses to H3 documents, >20 co-witnessing instances

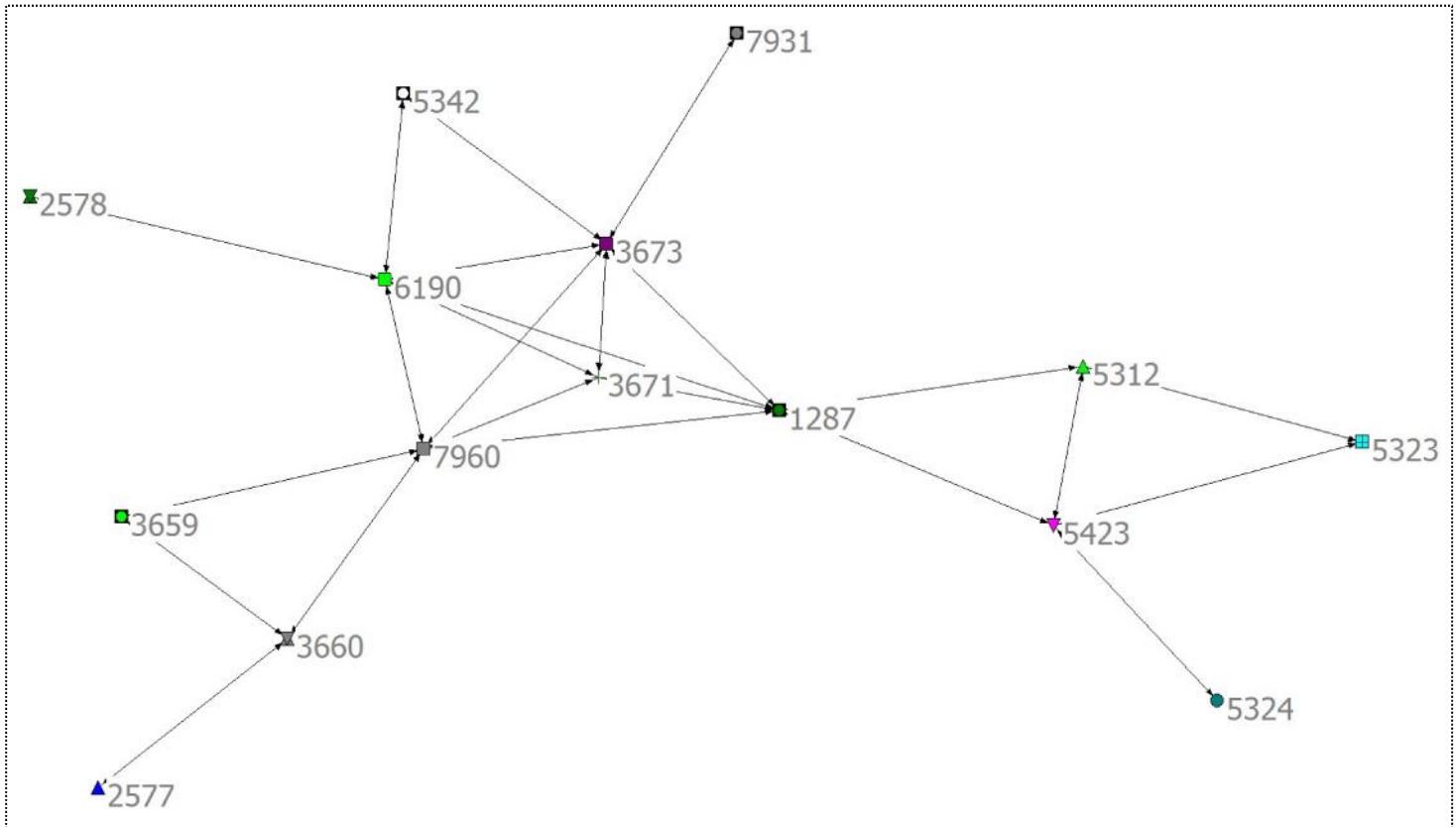


Figure 6.25. Netdraw: witnesses to H3 documents, >23 co-witnessing instances

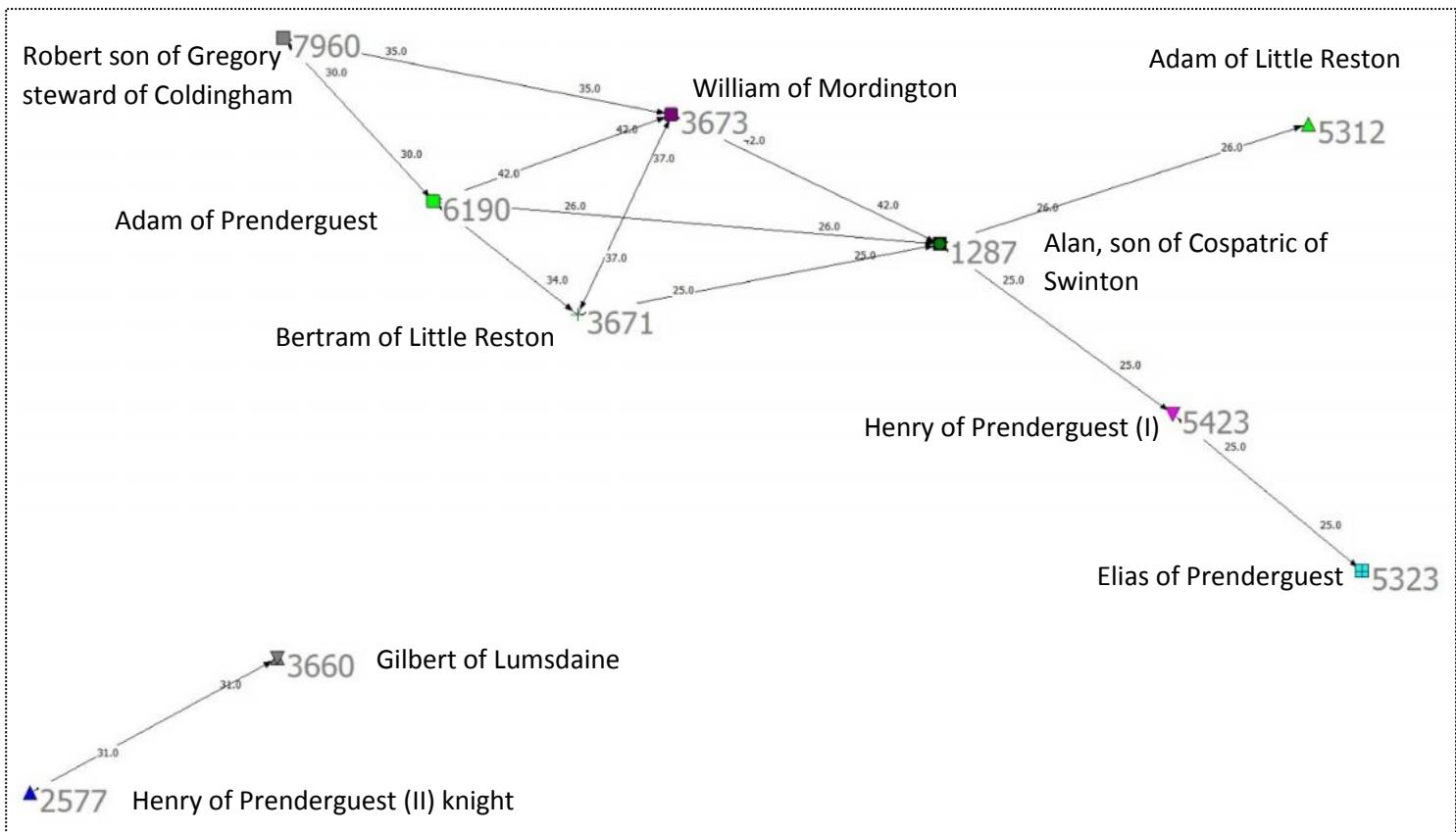


Figure 6.26. Netdraw: witnesses to H3 documents, >25 co-witnessing instances

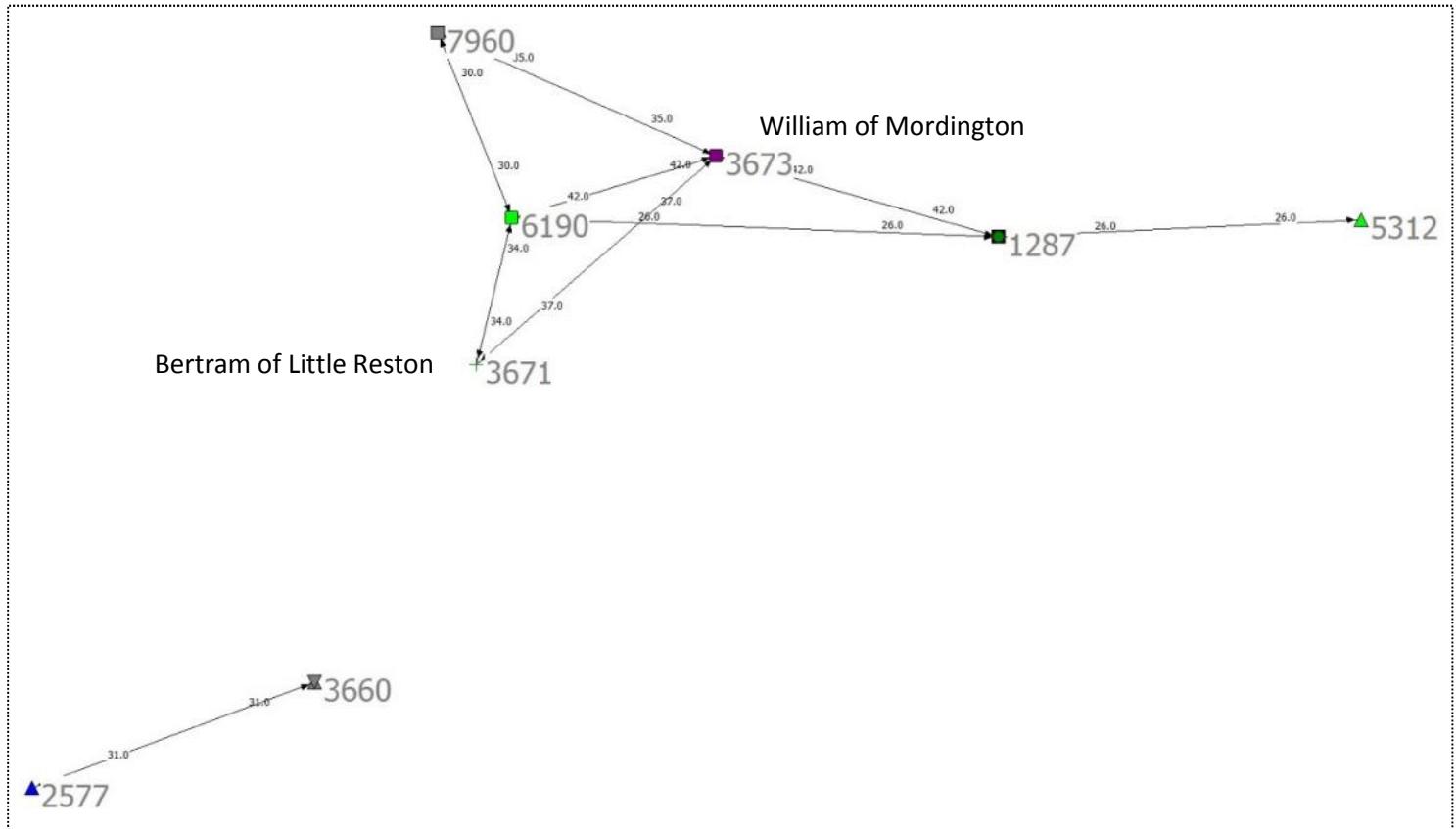


Figure 6.27. Netdraw: witnesses to H3 documents, >30 co-witnessing instances

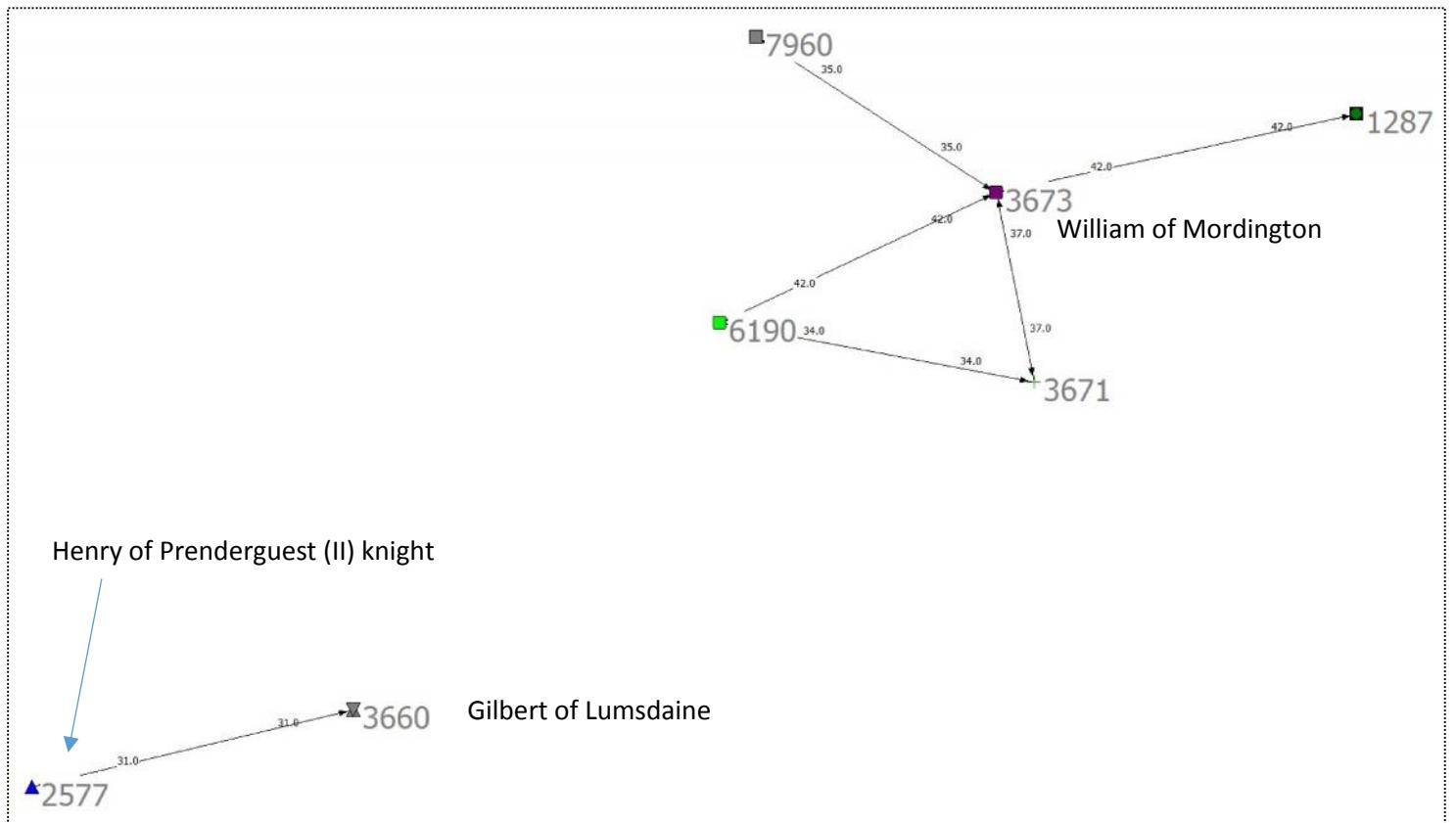


Figure 6.28. Netdraw: witnesses to H3 documents, >35 co-witnessing instances

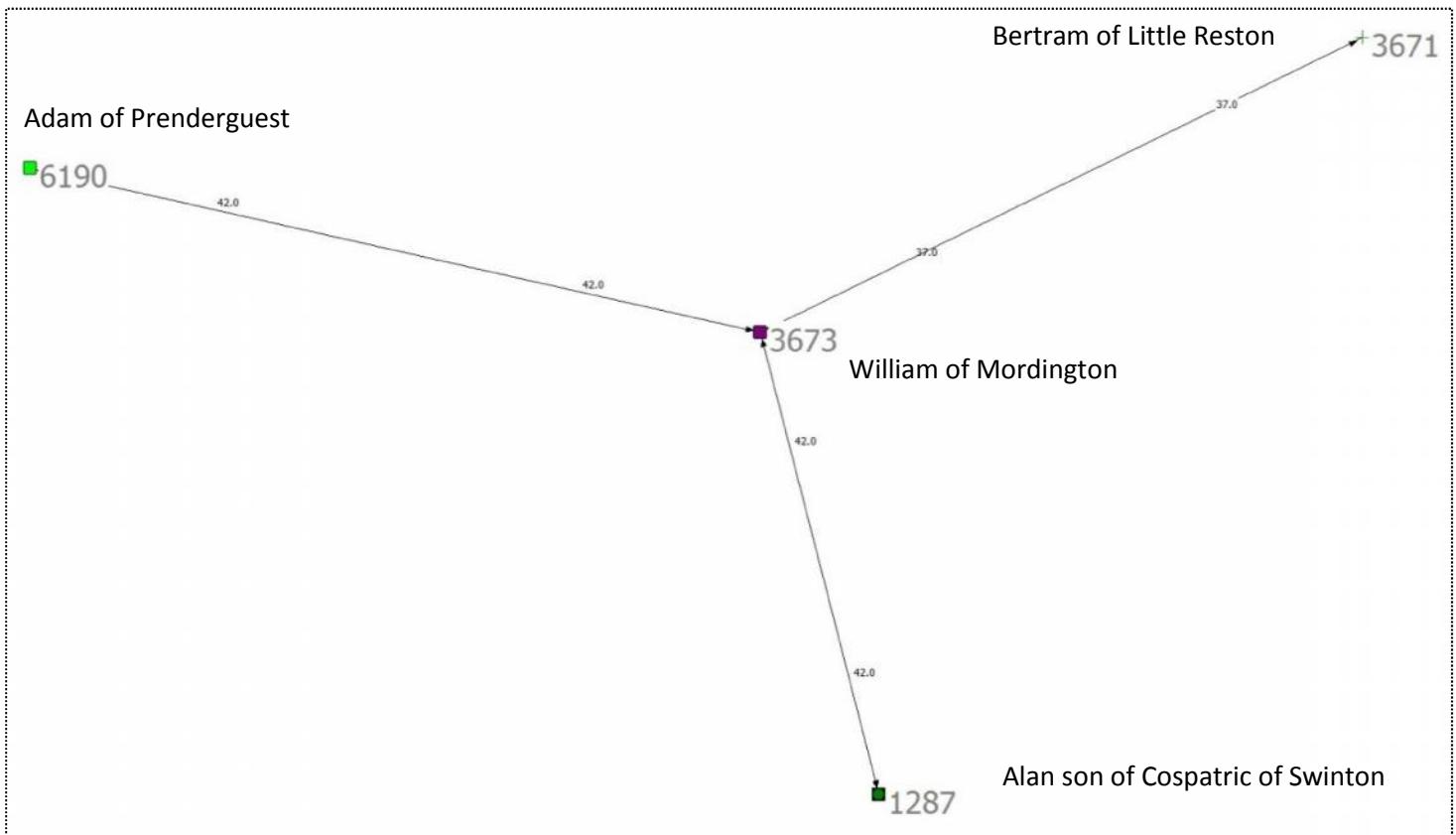


Figure 6.19 reveals a few of the social contexts in which witnesses appeared, at the level of witnessing together more than eight times. The Coldingham group at that level is joined by smaller groups centering on Lennox, Strathearn/ Dunblane, Dunbar, Fife & Strathearn, and the Ryedale family. The Coldingham witnesses dominate the higher reaches of co-witnessing acts, however, as tables 6.24 through 6.28 show. Individuals and families based on Prendergues, Swinton, Mordington, Reston, Ayton and Lumsdaine are all evident. Table 6.9 shows that every co-witnessing 'relationship' involving the witnessing of twenty or more documents involved individuals from the Coldingham group. William of Mordington in particular emerges as a key figure: he was a part of the top four pairs.

Table 6.9. Most productive co-witnessing 'relationships' (H3)

Person 1	Person 2	# docs
Alan, son of Cospatric of Swinton	William of Mordington	42
William of Mordington	Adam of Prenderguest	42
William of Mordington	Bertram of Little Reston (son of Adam of Little Reston)	37
William of Mordington	Robert, son of Gregory steward of Coldingham	35
Adam of Prenderguest	Bertram of Little Reston (son of Adam of Little Reston)	34
Gilbert of Lumsdaine	Henry of Prenderguest (II) knight	31
Adam of Prenderguest	Robert, son of Gregory steward of Coldingham	30
Alan, son of Cospatric of Swinton	Adam of Little Reston	26
Alan, son of Cospatric of Swinton	Adam of Prenderguest	26
Henry of Prenderguest (I)	Alan, son of Cospatric of Swinton	25
Henry of Prenderguest (I)	Elias of Prenderguest	25
Alan, son of Cospatric of Swinton	Bertram of Little Reston (son of Adam of Little Reston)	25
Alan, son of Cospatric of Swinton	Robert, son of Gregory steward of Coldingham	23
William of Scremerston, knight	Adam of Prenderguest	23
Robert, son of Gregory steward of Coldingham	Bertram of Little Reston (son of Adam of Little Reston)	23
Gilbert of Lumsdaine	David of Lumsdaine	23
Henry of Prenderguest (I)	William of Lumsdaine	22
William of Mordington	John, son of Elias of Ayton	22
Henry of Prenderguest (I)	Adam of Little Reston	21
Thomas of Nisbet	William of Mordington	21
Thomas of Nisbet	Adam of Prenderguest	21
Adam of Little Reston	Elias of Prenderguest	21
Robert, son of Gregory steward of Coldingham	Gilbert of Lumsdaine	21
Robert, son of Gregory steward of Coldingham	David of Lumsdaine	21
Alan, son of Cospatric of Swinton	John, son of Elias of Ayton	20
Adam of Prenderguest	John, son of Elias of Ayton	20
John, son of Elias of Ayton	Bertram of Little Reston (son of Adam of Little Reston)	20

PART THREE: NETWORK OF ALL H4 DOCUMENTS

There are 194 documents in the dataset, which comprises mostly two-sided documents recording agreements and settlements. There were 1412 witnesses, of whom only one (Queen Ermengarde) was a woman. There were 13,692 edges in the study. Due to the relatively small number of documents in the dataset and the tendency for agreements to record a critical mass of legal witnesses, there are an average of over 7 witnesses per document in this study.

The main characteristic of the H4 dataset is that it is a collection of highly disparate examples, with not a great degree of overlap. Few individuals witnessed together more than even once or twice. There is a case to be made that many of these agreements should be included in other case studies involving lay or ecclesiastical grantors, but that would involve painstaking crafting of bespoke datasets, so will have to be left for some time in the future. Interestingly, David earl of Huntingdon (d. 1219), brother of King William, had the highest degree and eigenvector centrality, although the majority of top players were bishops, abbots, archdeacons and other clergy. Indeed Earl David and King William himself were the only laymen to appear in the top 14 actors according to degree centrality, and in the top 19 according to eigenvector.

Table 6.10. Top twenty witnesses by betweenness centrality (H4)

Poms ID	Name	Betweeness
59	Gregory, bishop of Brechin (fl.1189x98-1242x46)	57453.19
1	William I, king of Scots (d.1214)	52716.99
445	Patrick (II), earl of Dunbar (d.1248)	51586.4
474	Guy, abbot of Lindores (d.1219)	48093.68
2047	Peter Ramsay, bishop of Aberdeen (d.1256)	44245.61
2115	Walter Lindsay (III), son of William (II) (d.c.1222)	42597.28
900	Adam, son of Gilbert, son of Richer, lord of Kilbucho	42446
4743	Fearchar, earl of Ross (d.1251)	39252.57
485	Jocelin, archdeacon of Dunkeld (fl.1165x67-1193/4)	35881.04
42	William del Bois, chancellor (d.1232)	35398.16
142	David, earl of Huntingdon (d.1219)	33617.82
789	Gilbert Murray, bishop of Caithness (d.1245)	32936.83
757	Richard of Coldingham, master (d.1198)	32846.94
2491	Stephen of Lilliesleaf, master, clerk, persona	32533.85
5330	Henry, son of Geoffrey de Liberatione of Perth	30456
835	Laurence of Thornton, archdeacon of St Andrews (d.1238x40)	27899.86
760	Brice Douglas, bishop of Moray (d.1222)	27242.42
858	Walter of St Albans, bishop of Glasgow (d.1232)	26530.04
2110	William of Brechin, knight	26036
768	William of Greenlaw, master (d.1247)	26003.83

Table 6.11. Top twenty witnesses by degree centrality (H4)

Poms ID	Name	Degree
142	David, earl of Huntingdon (d.1219)	124
2491	Stephen of Lilliesleaf, master, clerk, persona	122
863	Isaac Scott, master, clerk	117
474	Guy, abbot of Lindores (d.1219)	111
1	William I, king of Scots (d.1214)	106
42	William del Bois, chancellor (d.1232)	105
850	John Scott, bishop of Dunkeld (d.1203)	101
829	Ranulf de Wat, archdeacon of St Andrews (d.1209)	97
835	Laurence of Thornton, archdeacon of St Andrews (d.1238x40)	96
493	John of Leicester, bishop of Dunkeld (d.1214)	95
858	Walter of St Albans, bishop of Glasgow (d.1232)	93
809	Ralph, bishop of Brechin (d.1212x14)	86
40	William Malveisin, bishop of St Andrews (d.1238)	85
39	Hugh de Sigillo, bishop of Dunkeld (d.1229 or 1230)	84
445	Patrick (II), earl of Dunbar (d.1248)	82
4743	Fearchar, earl of Ross (d.1251)	82
798	Richard de Prebenda, bishop of Dunkeld (d.1210)	82
500	Osbert, abbot of Kelso (d.1203)	81
794	William, abbot of Holyrood (II) (fl.1187x89-1206)	78
2115	Walter Lindsay (III), son of William (II) (d.c.1222)	77

Table 6.12. Top twenty witnesses by eigenvector centrality (H4)

Poms ID	Name	Eigenvector
142	David, earl of Huntingdon (d.1219)	1
1	William I, king of Scots (d.1214)	0.908997
850	John Scott, bishop of Dunkeld (d.1203)	0.846207
829	Ranulf de Wat, archdeacon of St Andrews (d.1209)	0.83654
809	Ralph, bishop of Brechin (d.1212x14)	0.827825
798	Richard de Prebenda, bishop of Dunkeld (d.1210)	0.815957
863	Isaac Scott, master, clerk	0.80627
39	Hugh de Sigillo, bishop of Dunkeld (d.1229 or 1230)	0.792588
794	William, abbot of Holyrood (II) (fl.1187x89-1206)	0.788068
770	William of Hailes, master, dean of St Andrews (fl.1189x98)	0.775541
3057	Ralph, clerk of Bishop Roger of St Andrews	0.775541
820	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	0.764114
500	Osbert, abbot of Kelso (d.1203)	0.759679
493	John of Leicester, bishop of Dunkeld (d.1214)	0.73906
474	Guy, abbot of Lindores (d.1219)	0.727717
858	Walter of St Albans, bishop of Glasgow (d.1232)	0.718067
42	William del Bois, chancellor (d.1232)	0.713415
40	William Malveisin, bishop of St Andrews (d.1238)	0.656168
1450	Hugh, king's chaplain (TRW)	0.609706
260	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	0.601789

Figure 6.29. Netdraw: witnesses to H4 documents, >1 co-witnessing instances

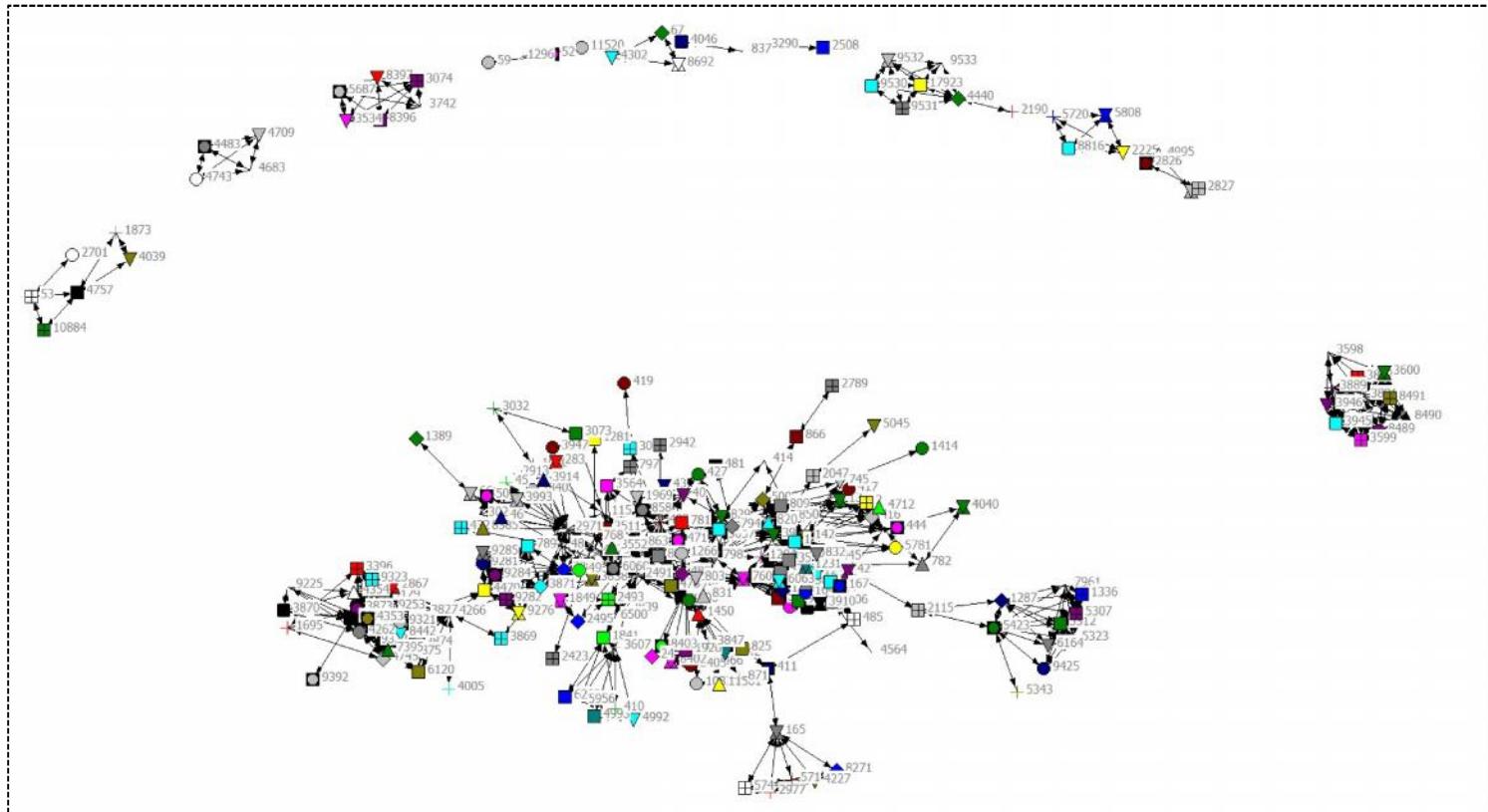


Figure 6.29. Netdraw: witnesses to H4 documents, >2 co-witnessing instances

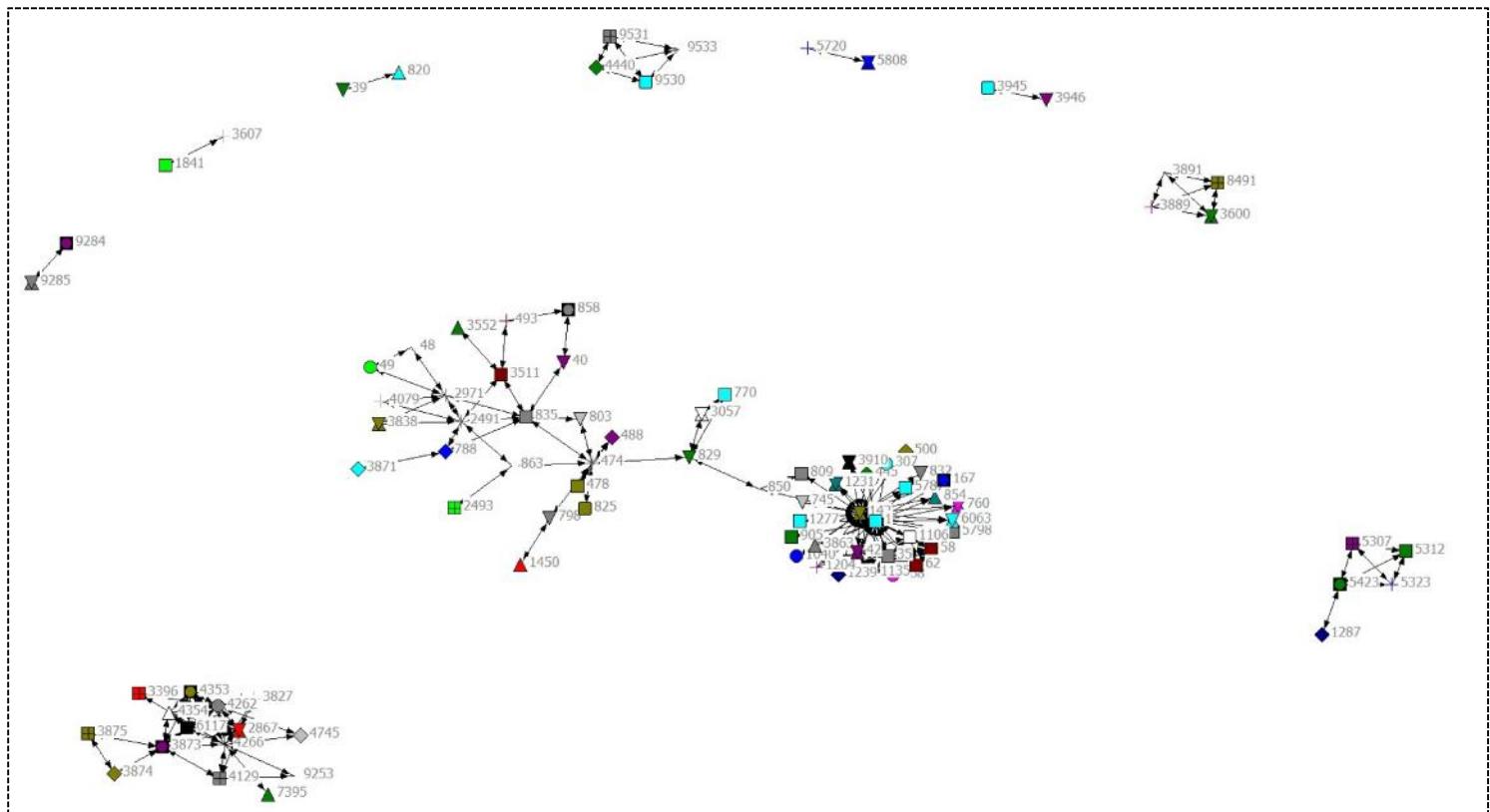


Figure 6.29. Netdraw: witnesses to H4 documents, >3 co-witnessing instances

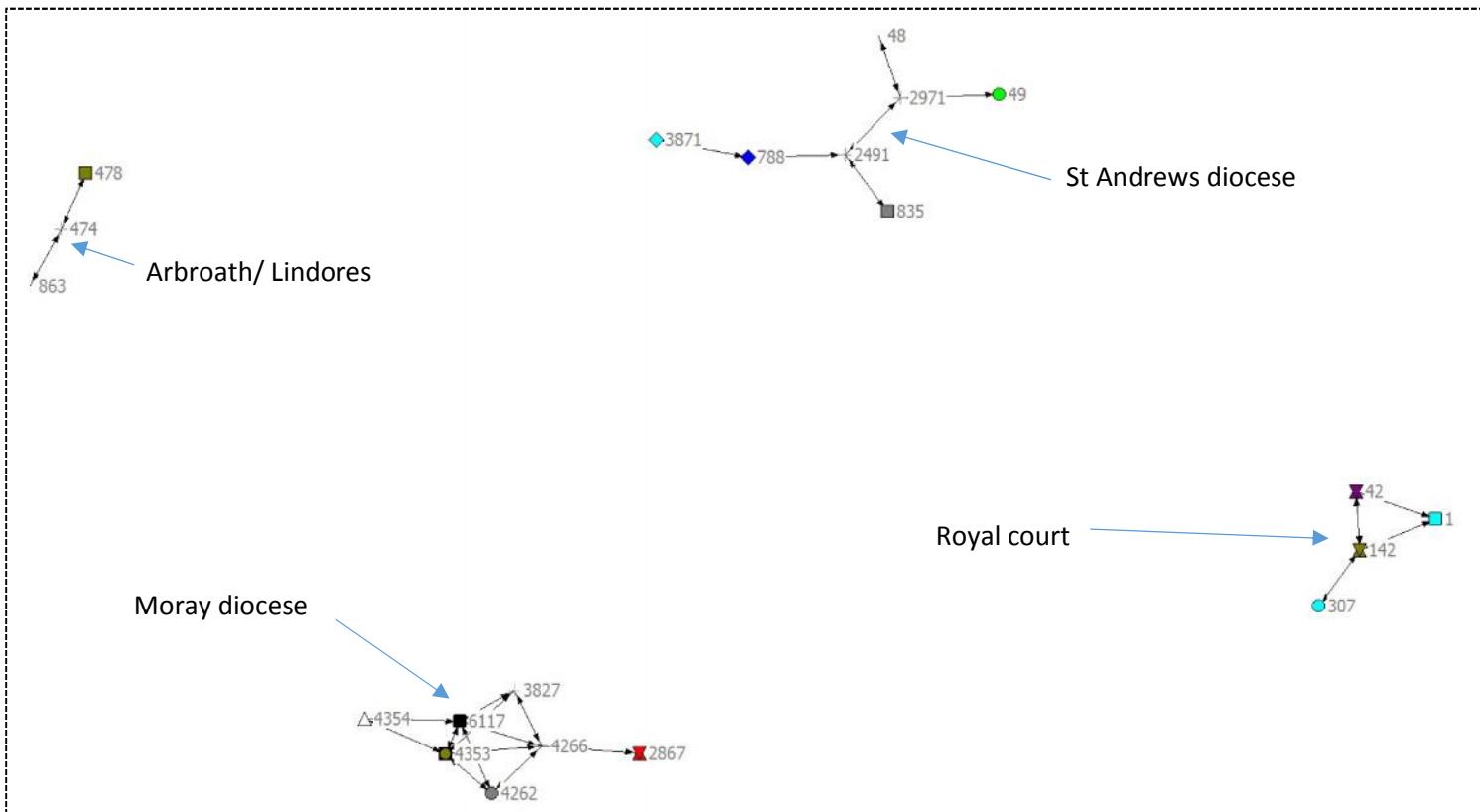


Figure 6.29. Netdraw: witnesses to H4 documents, >4 co-witnessing instances

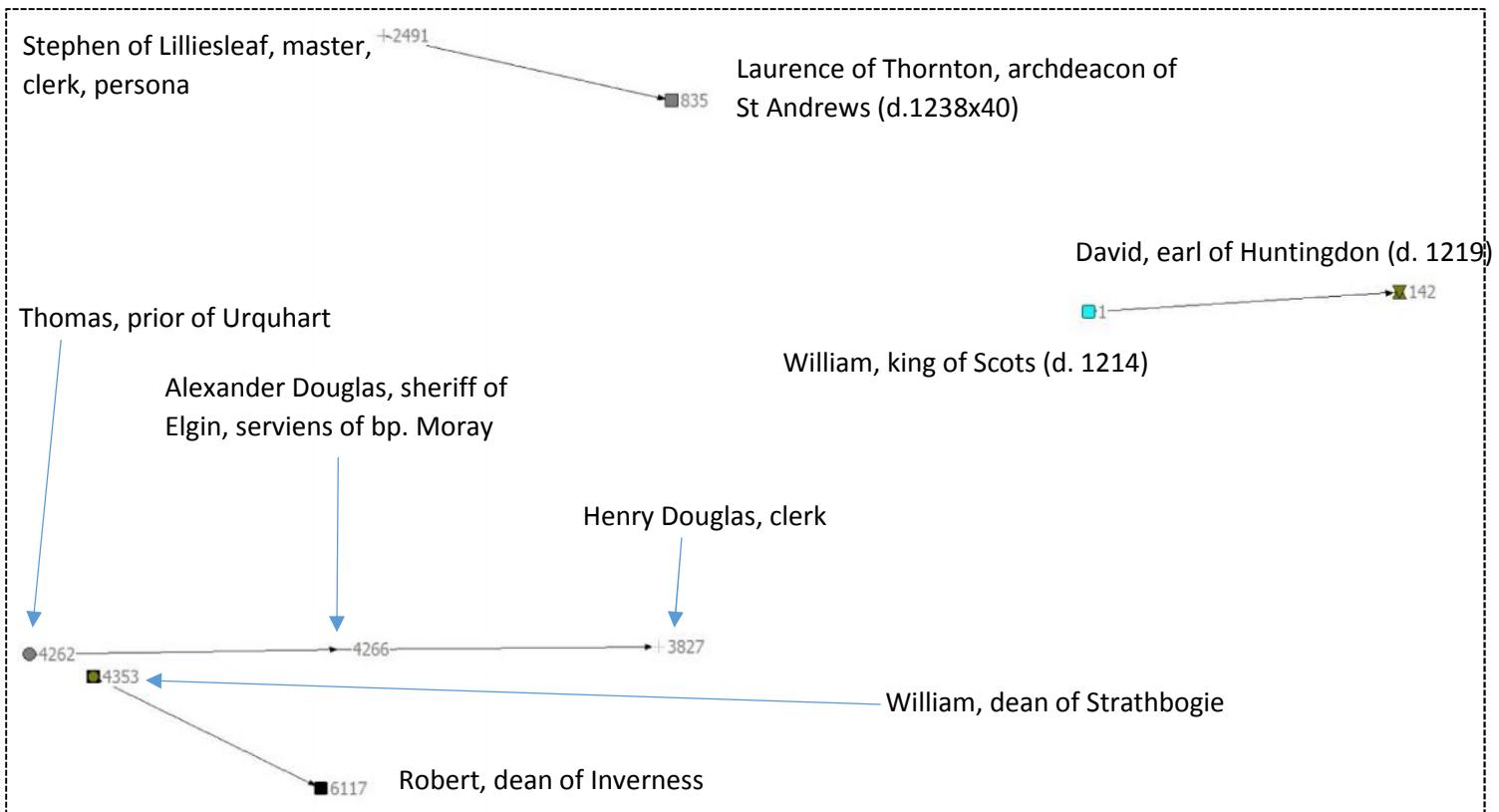


Table 6.13 highlights the importance of the diocese of Moray in the body of two-sided documents. The bishops of Moray had a marked preference for making formal agreements with magnates and others in the north of Scotland. This explains the predominance of individuals who co-witnessed relatively more than others in H4, despite the very low level of co-witnessing across the board. These men were Alexander Douglas, sheriff of Elgin, serviens of bp. Moray; Henry Douglas, clerk; Thomas, prior of Urquhart (fl.1226-32); William, dean of Strathbogie; Robert, dean of Inverness; Andrew Murray, bishop of Moray (d.1242); Augustine of Elgin and Gregory, dean of Strathspey.

Table 6.13. Most productive co-witnessing 'relationships' (H4)

Person 1	Person 2	#docs
David, earl of Huntingdon (d.1219)	William I, king of Scots (d.1214)	8
Laurence of Thornton, archdeacon of St Andrews (d.1238x40)	Stephen of Lilliesleaf, master, clerk, persona	7
Alexander Douglas, sheriff of Elgin, serviens of bp. Moray	Henry Douglas, clerk	5
Alexander Douglas, sheriff of Elgin, serviens of bp. Moray	Thomas, prior of Urquhart (fl.1226-32)	5
Robert, dean of Inverness	William, dean of Strathbogie	5
Alexander Douglas, sheriff of Elgin, serviens of bp. Moray	Augustine of Elgin	4
Alexander Douglas, sheriff of Elgin, serviens of bp. Moray	Robert, dean of Inverness	4
Alexander Douglas, sheriff of Elgin, serviens of bp. Moray	William, dean of Strathbogie	4
Andrew Murray, bishop of Moray (d.1242)	Edward Murray, master, canon, bishop's clerk	4
Andrew Murray, bishop of Moray (d.1242)	Stephen of Lilliesleaf, master, clerk, persona	4
David, earl of Huntingdon (d.1219)	Robert of London (d.1225)	4
David, earl of Huntingdon (d.1219)	William del Bois, chancellor (d.1232)	4
Gregory, dean of Strathspey	Robert, dean of Inverness	4
Gregory, dean of Strathspey	William, dean of Strathbogie	4
Guy, abbot of Lindores (d.1219)	Henry, abbot of Arbroath (fl.1179-1207)	4
Guy, abbot of Lindores (d.1219)	Isaac Scott, master, clerk	4
Henry Douglas, clerk	Robert, dean of Inverness	4
Henry Douglas, clerk	William, dean of Strathbogie	4
Peter, chaplain and clerk of Bishop Malveisin	Simon de Noisy, clerk of Bishop William of St Andrews	4
Peter, chaplain and clerk of Bishop Malveisin	Stephen of Lilliesleaf, master, clerk, persona	4
Peter, chaplain and clerk of Bishop Malveisin	William of Gullane, rector of Gullane	4
Robert, dean of Inverness	Thomas, prior of Urquhart (fl.1226-32)	4
Thomas, prior of Urquhart (fl.1226-32)	William, dean of Strathbogie	4
William del Bois, chancellor (d.1232)	William I, king of Scots (d.1214)	4

PART FOUR: GRANTOR CASE STUDIES

1. Documents of the bishops of St Andrews (H2/10/)

There were 194 documents, of which 192 were charters and two were notifications. There were 600 witnesses, of whom only one was a woman, and 8306 edges in the study.

The most central individuals in the network were active in the mid-to-late twelfth century. The Gephi sociogram below shows the especially well-represented grouping at this chronological period. Matthew, bishop of Aberdeen, the most central person by both degree and eigenvector, owes his prominence primarily to his position as archdeacon of St Andrews from around 1150 to 1172. His successor in the office, Walter of Roxburgh, archdeacon from 1173 to some point between 1179 and 1188, was the fourteenth most central person by degree. Ranulf de Wat, who was archdeacon from 1199 to 1209, had a degree almost as high as Matthew, but had a much lower eigenvector – only about 67%. Matthew's Lothian counterpart, Andrew, had the second highest eigenvector score, at 97.5%. The archdeacon of Lothian, Thorald, also appears in our league tables. John of Leicester, bishop of Dunkeld from 1212 to 1214, appears here in the 'top ten' because he was archdeacon of Lothian from 1200 to 1212. John Scott, bishop of Dunkeld from around 1183 to 1203, had been a member of the St Andrews familia, was a magister (equivalent of university graduate), and was the St Andrews' church establishment's choice for bishop in 1178 against the wishes of the king. Most of the other central figures listed below were members of the bishops' familia in the later twelfth century, as clerks, chaplains, chancellors, and so on. Most of these men were clerics, also we should also note the steward Odo of Kinninmonth and the doorward Gamel.

Table 6.14. Centrality by Degree

Poms ID	Name	Eigenvector	Degree
2	Matthew, bishop of Aberdeen (d.1199)	1	170
829	Ranulf de Wat, archdeacon of St Andrews (d.1209)	0.666611	169
411	Andrew, archdeacon of Lothian (fl.1147x59-1178x84)	0.975104	167
3016	Alexander, chaplain of bishops of St Andrews (12C)	0.838007	165
165	Aiulf, dean of Lothian (fl.1150/51-1186)	0.967106	163
862	Herbert Scott, master, clerk (fl.1144x59-1172x78)	0.861768	145
850	John Scott, bishop of Dunkeld (d.1203)	0.819292	143
571	Thorald, archdeacon of Lothian (d.1163 or 1166)	0.830259	140

493	John of Leicester, bishop of Dunkeld (d.1214)	0.57092	128
271	Robert, son of Saewulf, bishop's chancellor	0.800845	122
202	Andrew, bishop of Caithness (d.1184)	0.840326	117
13	Duncan (II), earl of Fife (d.1204)	0.779377	111
2781	Abraham of Dunkeld, master, canon (fl.1162x78)	0.701784	111
821	Walter of Roxburgh, archdeacon of St Andrews (fl.1165x72-1179x88)	0.552546	106
863	Isaac Scott, master, clerk	0.442392	105
1022	Odo of Kinninmonth, steward, marischal (d.c.1195)	0.691995	104
2483	Gamel, doorward, master (St Andrews)	0.58609	104
3072	Richard, chaplain of Bishop Roger of St Andrews	0.441602	104
2978	Stephen, clerk (St Andrews)	0.764677	103
133	Nicholas of Roxburgh, chancellor (d.1171?)	0.70273	99

The table of people who witnessed alongside one another most frequently is likewise a testament to the richness of the mid-to-late twelfth century charter material, the longevity of many of the careers, and, perhaps, the cohesiveness of the relationships formed between these men. The positions of some of these men, such as those who served as archdeacons, should not surprise us, but the appearance of some other witnesses is perhaps less expected. The chaplain Alexander witnessed 63 surviving document texts, nearly all of them episcopal charters and agreements of the bishops. His career spanned thirty years from the early 1160s to (most likely) the early 1190s. Three of the top five co-witnessing 'relationships' involve Alexander the chaplain. Men like these provided important institutional continuity through changes of personnel higher up the food chain. Master Herbert Scot was also an important figure in the formative period of the 1150s and 1160s. He witnessed 29 times with Matthew, who was archdeacon of St Andrews at the time, and 27 times with Andrew, archdeacon of Lothian. We know from historical evidence that Matthew was at the centre of a 'network' derived which represented the legacy of Bishop Robert (1124-59). Master Herbert Scot, Master John Scot, and Aiulf dean of Lothian were key members of this power grouping (Hammond, 'Founding of the Burgh', 80): all four of these men are in the top 7 by degree and have eigenvector scores over 80%. Andrew, archdeacon of Lothian, however, appears to have acted in opposition to them (Watt, *Graduates*). Ten of the most productive co-witnessing 'relationships' include one or two of these four men. Towards the lower end of the following table, we find a few personnel of the time of Bishop William Malveisin (1202-38), most notably the archdeacon of St Andrews, Laurence of Thornton and the bishop's chaplain and clerk, Peter.

Table 6.15. Most productive co-witnessing 'relationships' (H2/10)

Person 1	Person 2	# docs
Andrew, archdeacon of Lothian (fl.1147x59-1178x84)	Alexander, chaplain of bishops of St Andrews (12C)	32
Alexander, chaplain of bishops of St Andrews (12C)	Walter of Roxburgh, archdeacon of St Andrews (fl.1165x72-1179x88)	30
Matthew, bishop of Aberdeen (d.1199)	Herbert Scott, master, clerk (fl.1144x59-1172x78)	29
Andrew, archdeacon of Lothian (fl.1147x59-1178x84)	Herbert Scott, master, clerk (fl.1144x59-1172x78)	27
Alexander, chaplain of bishops of St Andrews (12C)	Abraham of Dunkeld, master, canon (fl.1162x78)	27
Aiulf, dean of Lothian (fl.1150/51-1186)	Andrew, archdeacon of Lothian (fl.1147x59-1178x84)	26
Aiulf, dean of Lothian (fl.1150/51-1186)	Herbert Scott, master, clerk (fl.1144x59-1172x78)	23
Robert, son of Saewulf, bishop's chancellor	Alexander, chaplain of bishops of St Andrews (12C)	23
Matthew, bishop of Aberdeen (d.1199)	Andrew, archdeacon of Lothian (fl.1147x59-1178x84)	21
Andrew, archdeacon of Lothian (fl.1147x59-1178x84)	Abraham of Dunkeld, master, canon (fl.1162x78)	21
John Scott, bishop of Dunkeld (d.1203)	Alexander, chaplain of bishops of St Andrews (12C)	21
Laurence of Thornton, archdeacon of St Andrews (d.1238x40)	Peter, chaplain and clerk of Bishop Malveisin	21
Laurence of Thornton, archdeacon of St Andrews (d.1238x40)	Edward Murray, master, canon, bishop's clerk	21
Andrew, archdeacon of Lothian (fl.1147x59-1178x84)	Robert, son of Saewulf, bishop's chancellor	20
Herbert Scott, master, clerk (fl.1144x59-1172x78)	Robert, son of Saewulf, bishop's chancellor	20
Laurence of Thornton, archdeacon of St Andrews (d.1238x40)	Michael, master, clerk, chaplain (fl.1201-1220x25)	20
Peter, chaplain and clerk of Bishop Malveisin	Stephen of Lilliesleaf, master, clerk, persona	20
Peter, chaplain and clerk of Bishop Malveisin	Michael, master, clerk, chaplain (fl.1201-1220x25)	20

Figure 6.29. Gephi: witnesses to documents of the bishops of St Andrews (H2/10)

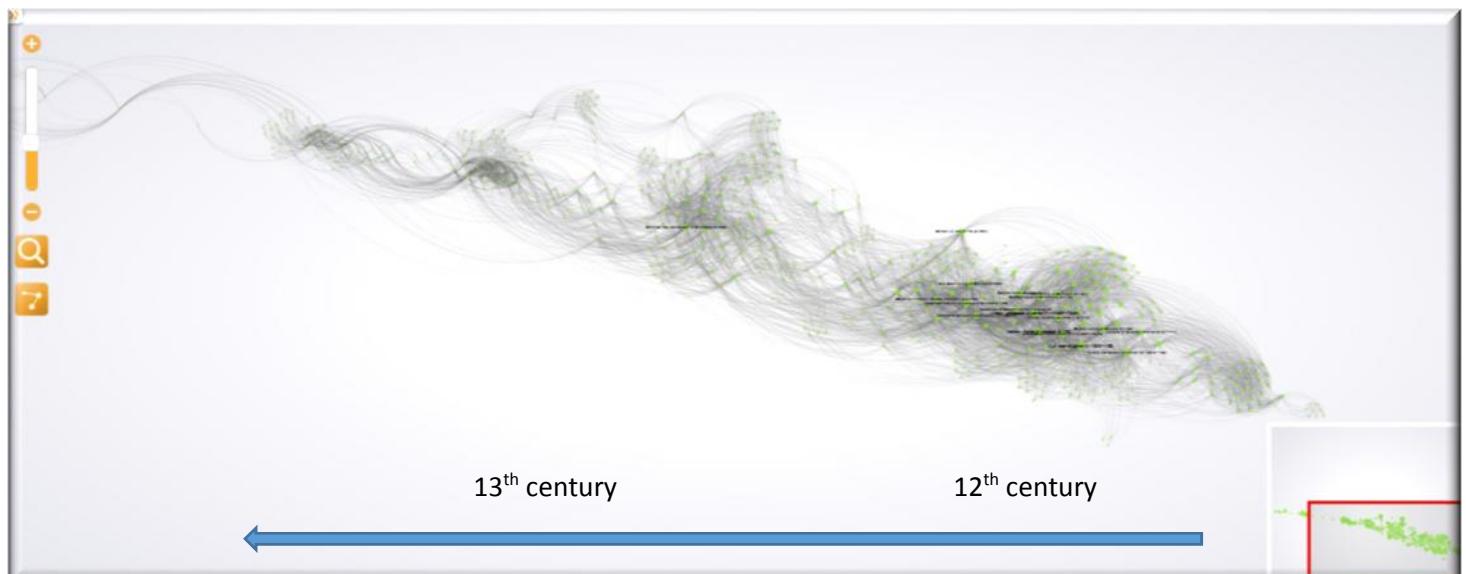


Figure 6.30. Gephi: witnesses to H2/10 documents, close-up

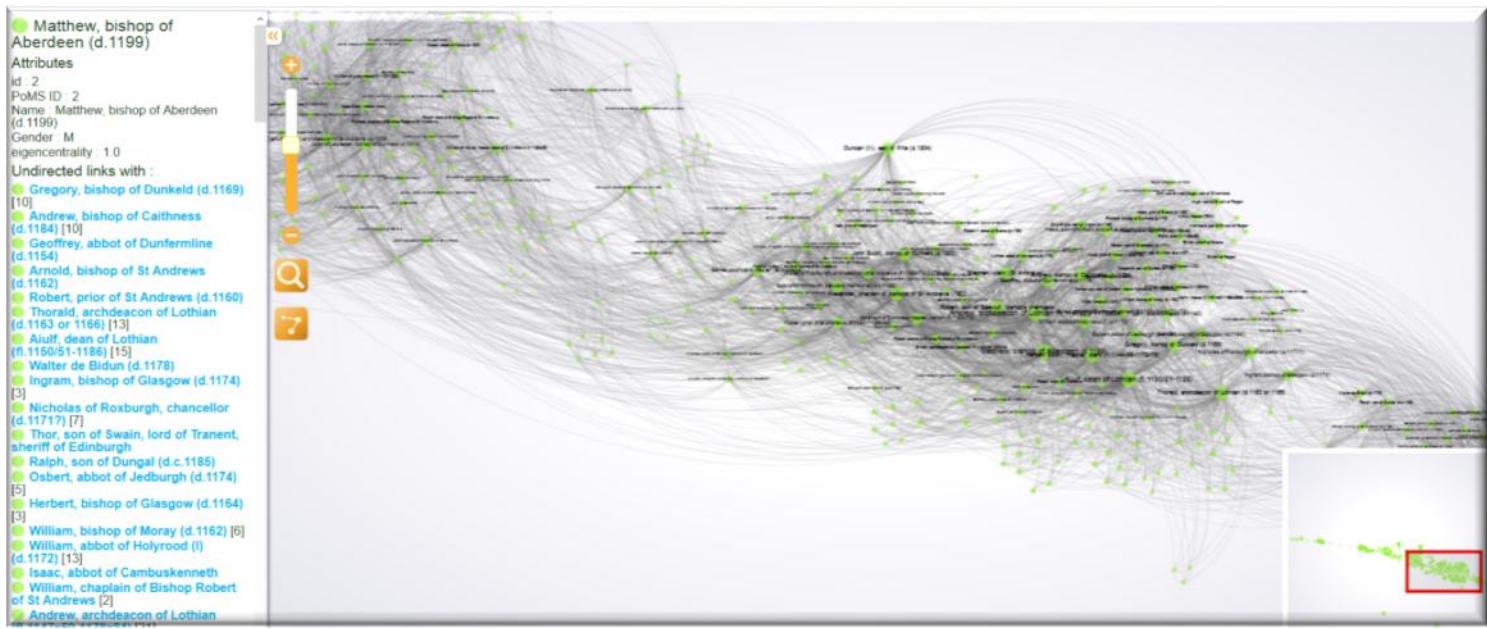


Figure 6.31. Gephi: witnesses to H2/10 documents, close-up

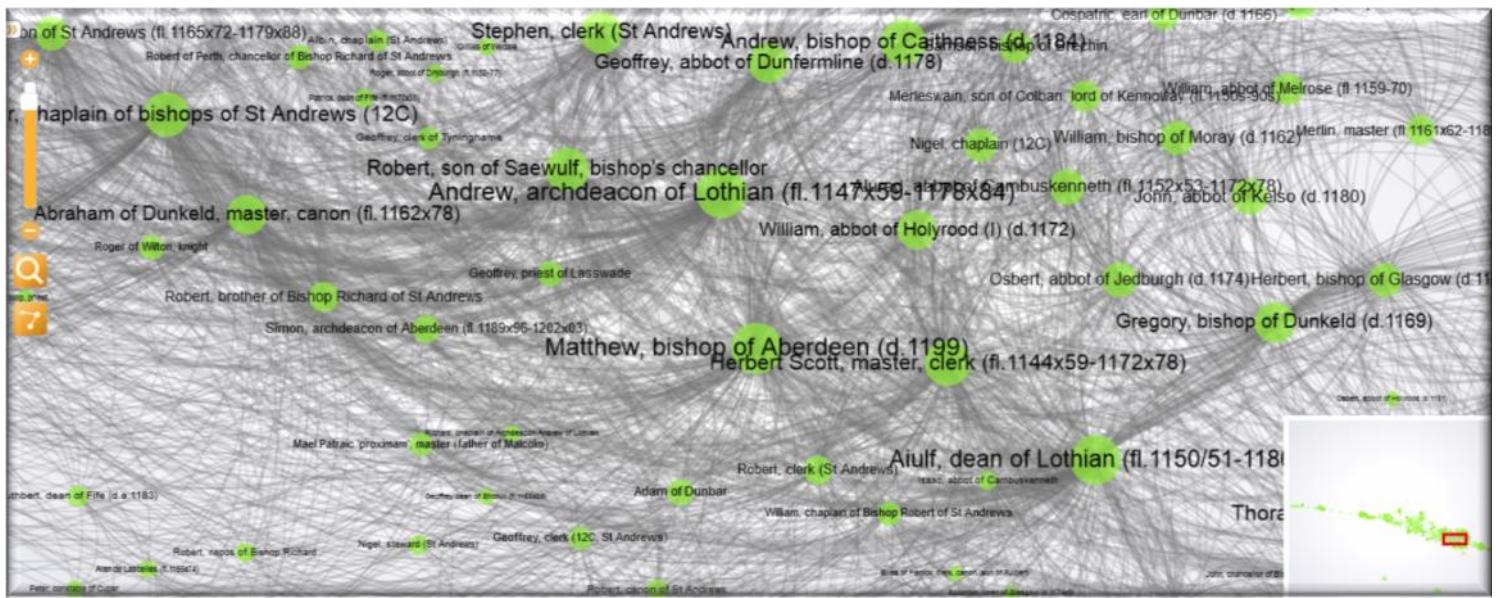


Figure 6.32. Netdraw: witnesses to H2/10 documents

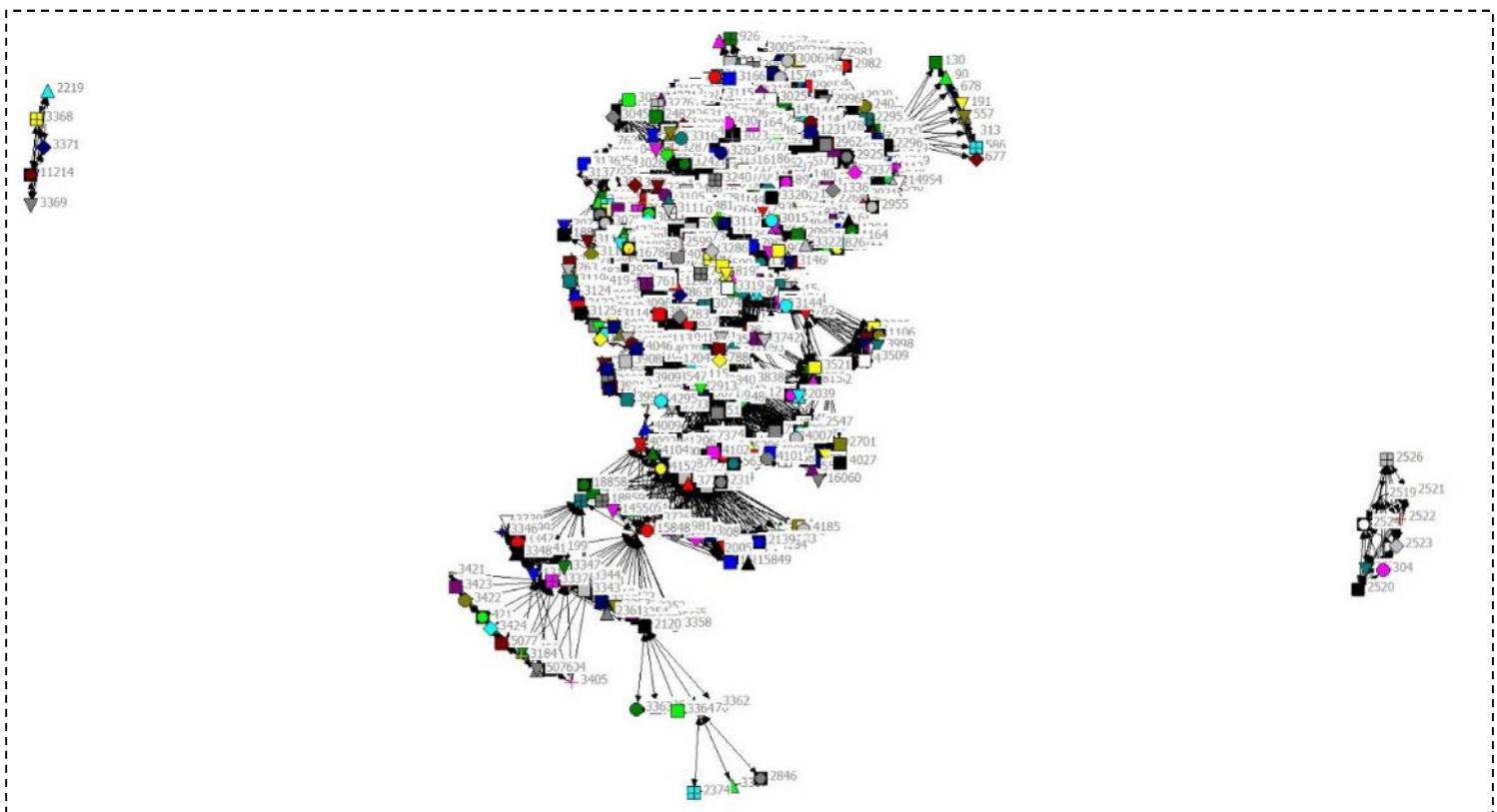
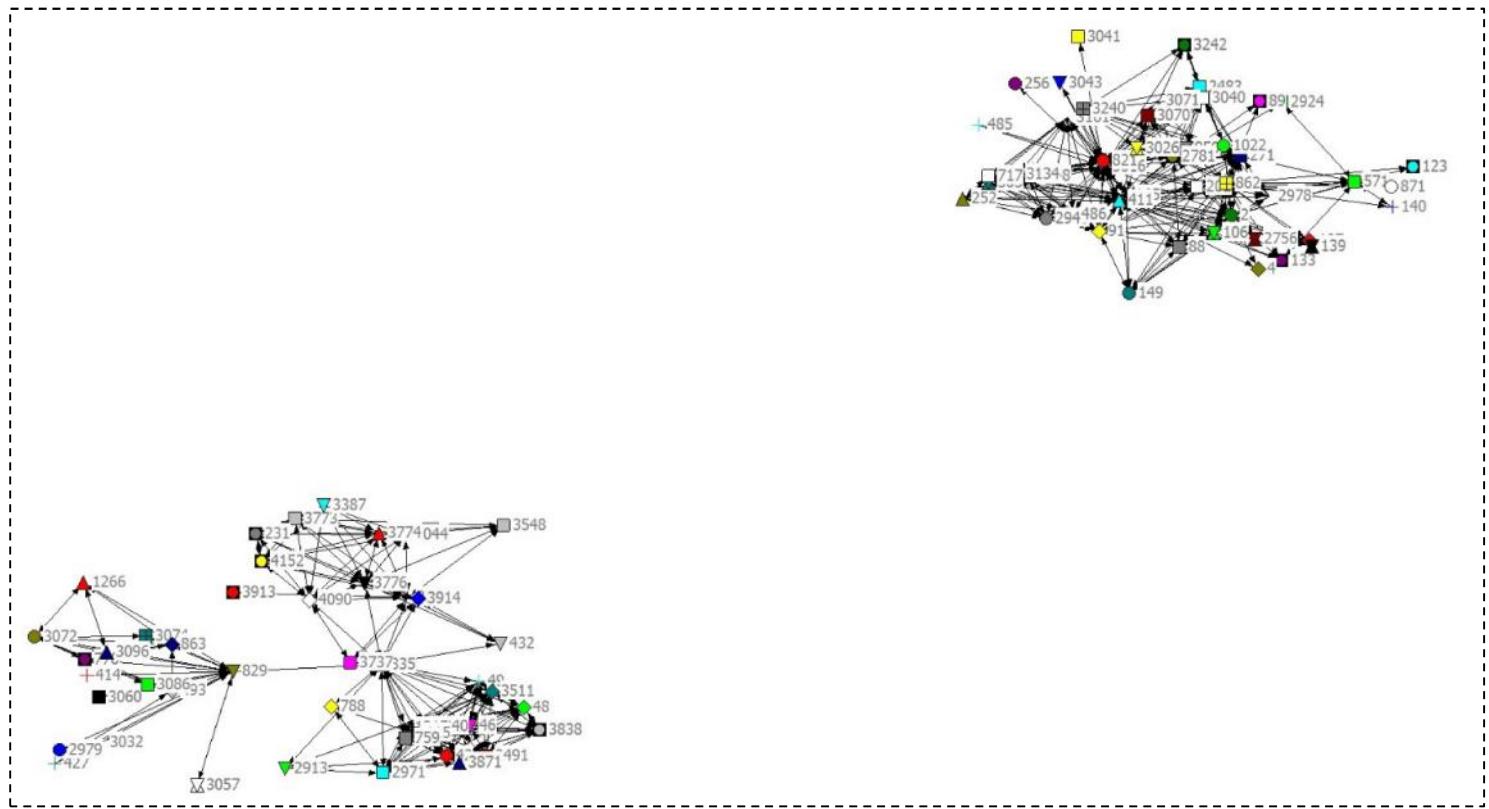


Figure 6.34. Netdraw: witnesses to H2/10 documents, >5 co-witnessing instances



At the level of more than three witnessing connections, it is clear that we have two main segments. The segment in the top right is highly interconnected and represents the group of individuals active in the second half of the twelfth century who have the highest centrality and were discussed above. The segment in the bottom left is bifurcated, with only the link between numbers 829 and 3737 connecting the two 'halves'. Number 829 is the archdeacon Ranulf de Wat (d. 1209) and number 835, his successor as archdeacon of St Andrews, Laurence of Thornton (d. 1240). Thus we have two completely disconnected groups of St Andrews personnel, one from the mid-to-late twelfth century, the other from the early-to-mid thirteenth century.

Figure 6.35. Netdraw: witnesses to H2/10 documents, >8 co-witnessing instances

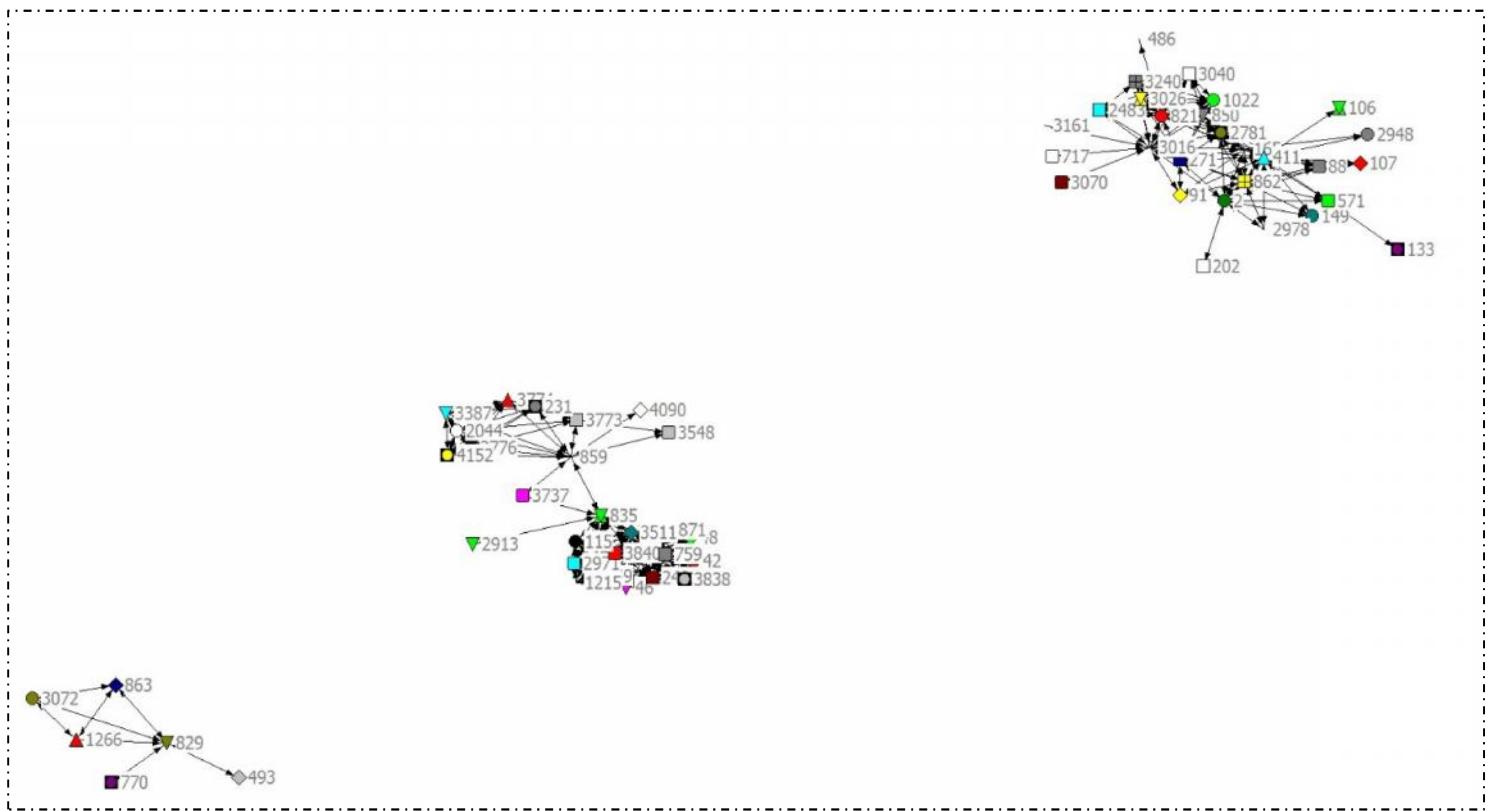
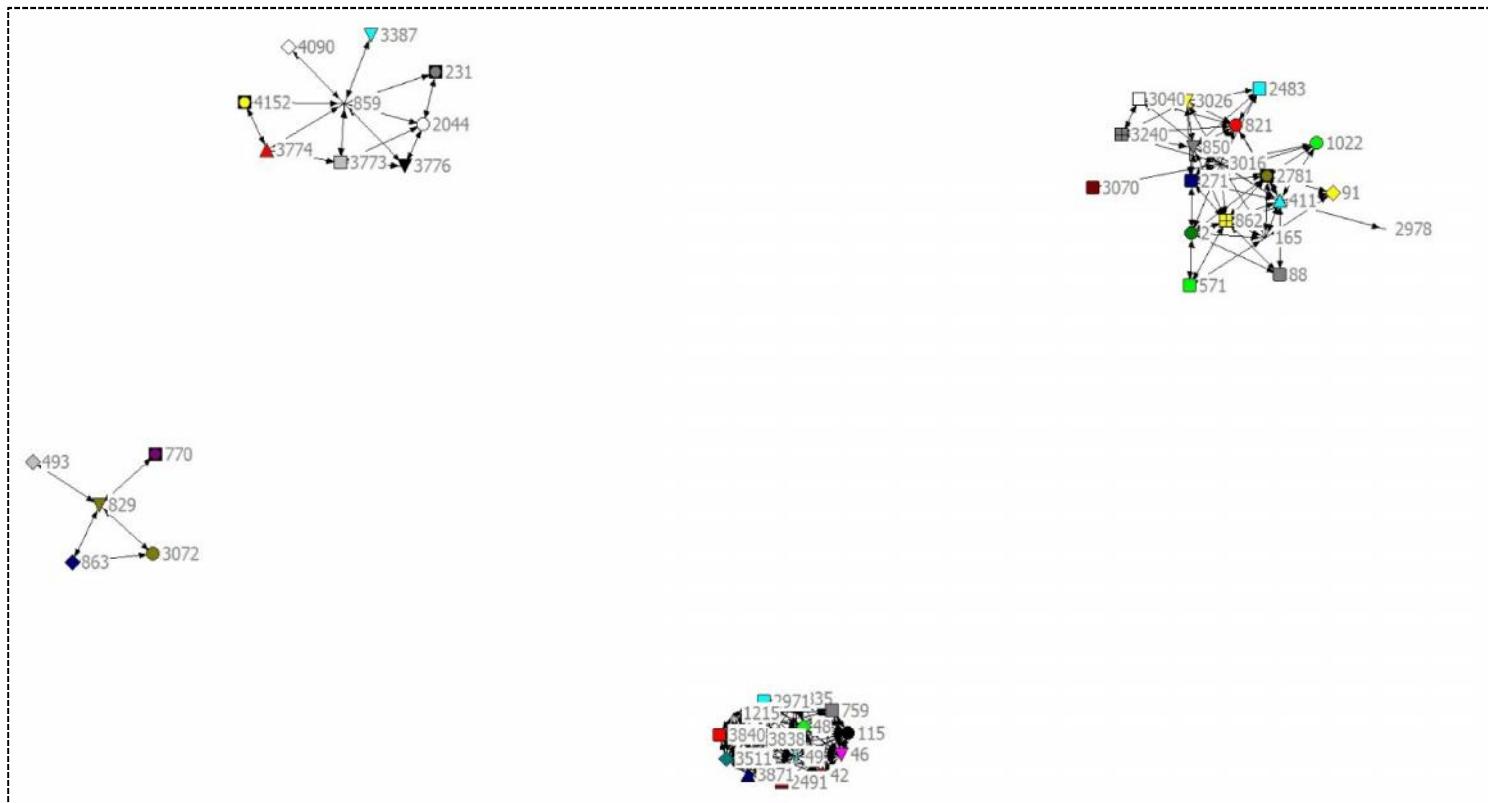


Figure 6.36. Netdraw: witnesses to H2/10 documents, >10 co-witnessing instances



At the level of more than ten co-witnessing instances, we are left with four distinct and separate segments. On the left we have a group of five, centred around no 829, archdeacon Ranulf de Wat (d. 1209). These men are John of Leicester [493], his counterpart archdeacon in Lothian, Master William of Hailes, dean of St Andrews [770], a 'dean of Christianity', Bishop Roger's chaplain, Richard [3072], and the clerk Master Isaac Scot [863]. Moving clockwise, there is another segment focused around the central figure of Master Alexander de St Martin [859], who was active from the 1220s through 1240s, and was the archdeacon of Lothian's official at one point. He is involved in five triads and one clique of four. These men include the masters Alexander of Edinburgh [3773] and Hugh of Melbourne [3776], and Adam, archdeacon of Lothian in the 1240s [231]. The larger, more interconnected segment in the top right, represents the twelfth-century group we have already encountered, including [2] Matthew, bishop of Aberdeen (d. 1199), [862] Master Herbert Scot, [271] the episcopal chancellor Robert son of Saewulf, but also including contemporaneous abbots, e.g. [88] William (I), abbot of Holyrood (d. 1172) and [91] Geoffrey, abbot of Dunfermline (d. 1178). The segment at the bottom of the graph represents the personnel of the episcopate of William Malveisin (1202-38), and includes [3840] Peter of Dryburgh, master, clerk, [3838] Adam Ovid, master (fl. 1203-33), [3871] Edward Murray, master, canon, bishop's clerk, [46] Richard of Dover (Tyningham), master, clerk, [48] Simon de Noisy, clerk of Bishop William of St Andrews, and [49] William of Gullane, rector of Gullane. It also includes the chancellor William del Bois [42], whom we have encountered on multiple occasions. This is more visible on the sociogram of more than 13 co-witnessing acts, below.

Figure 6.37. Netdraw: witnesses to H2/10 documents, >13 co-witnessing instances

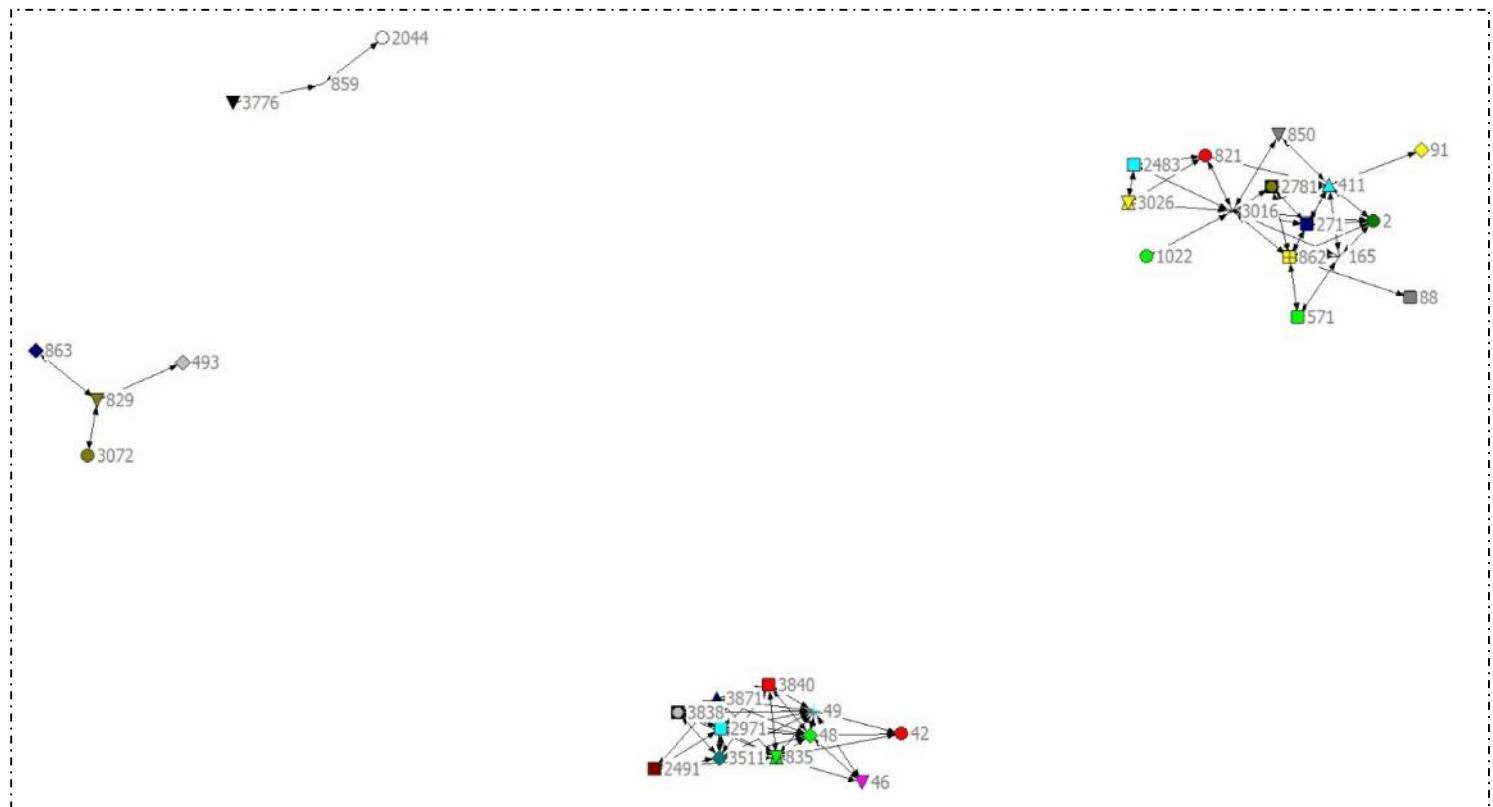


Figure 6.38. Netdraw: witnesses to H2/10 documents, >15 co-witnessing instances

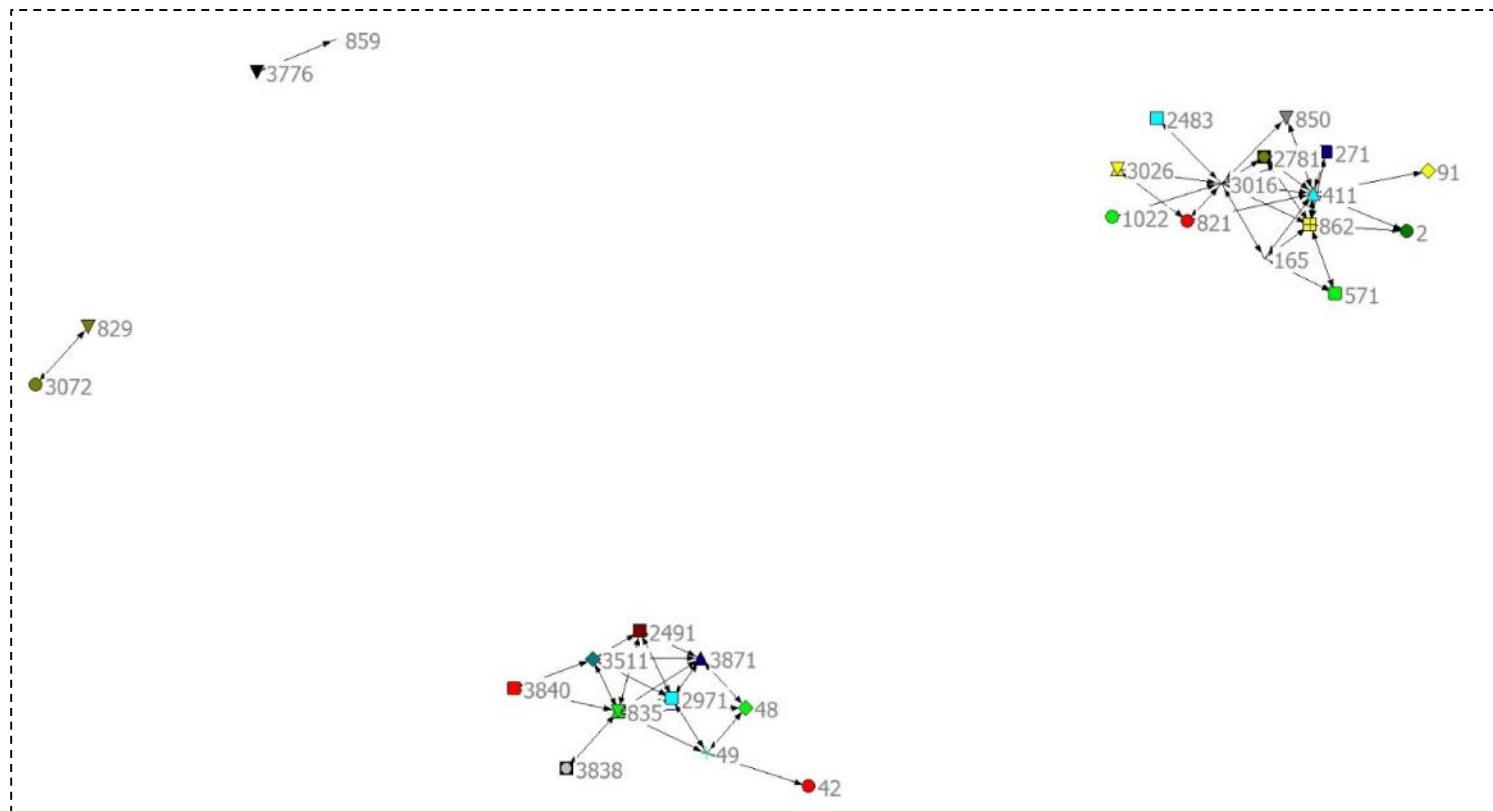


Figure 6.39. Netdraw: witnesses to H2/10 documents, >17 co-witnessing instances



Figure 6.40. Netdraw: witnesses to H2/10 documents, >20 co-witnessing instances

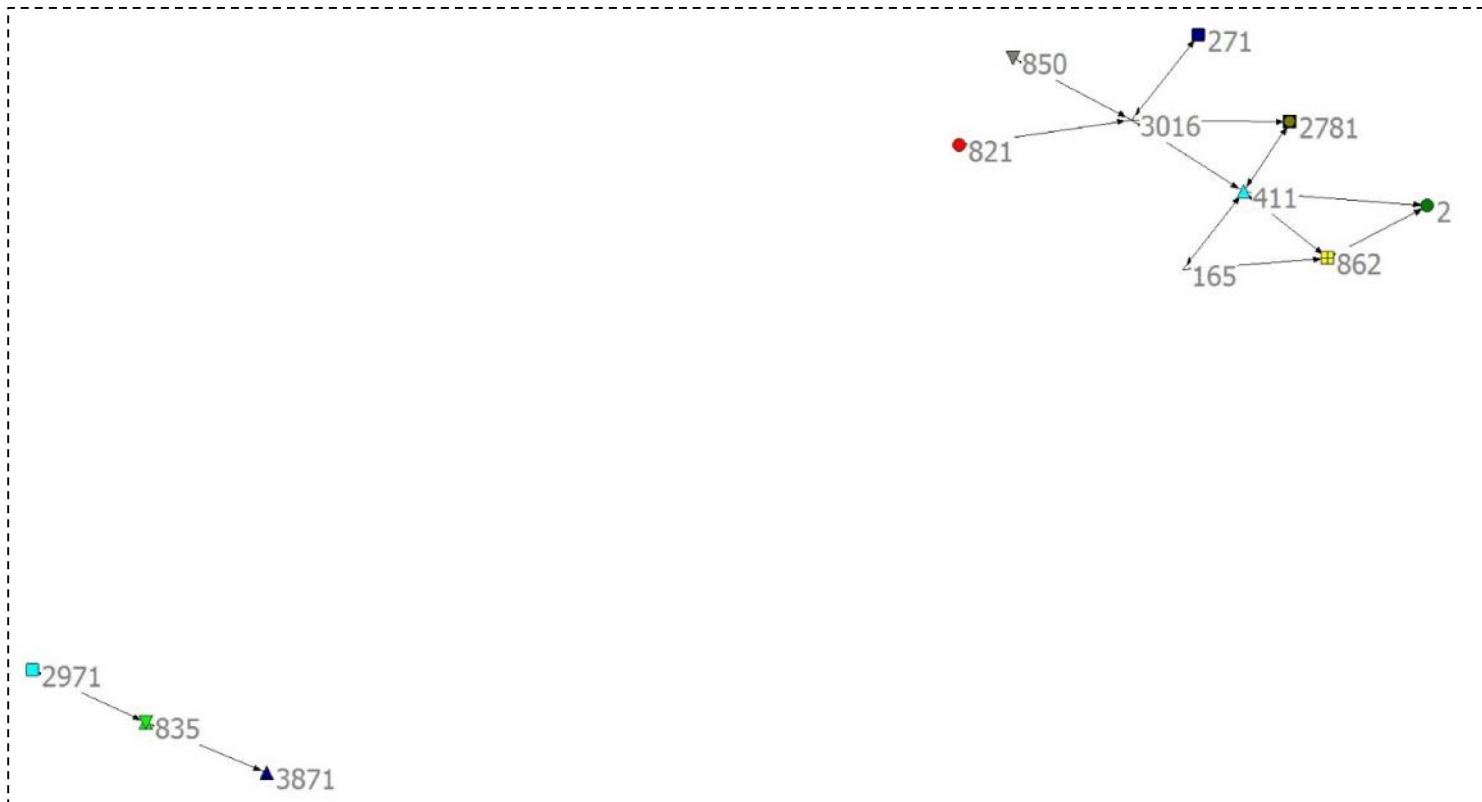


Figure 6.41. Netdraw: witnesses to H2/10 documents, >25 co-witnessing instances

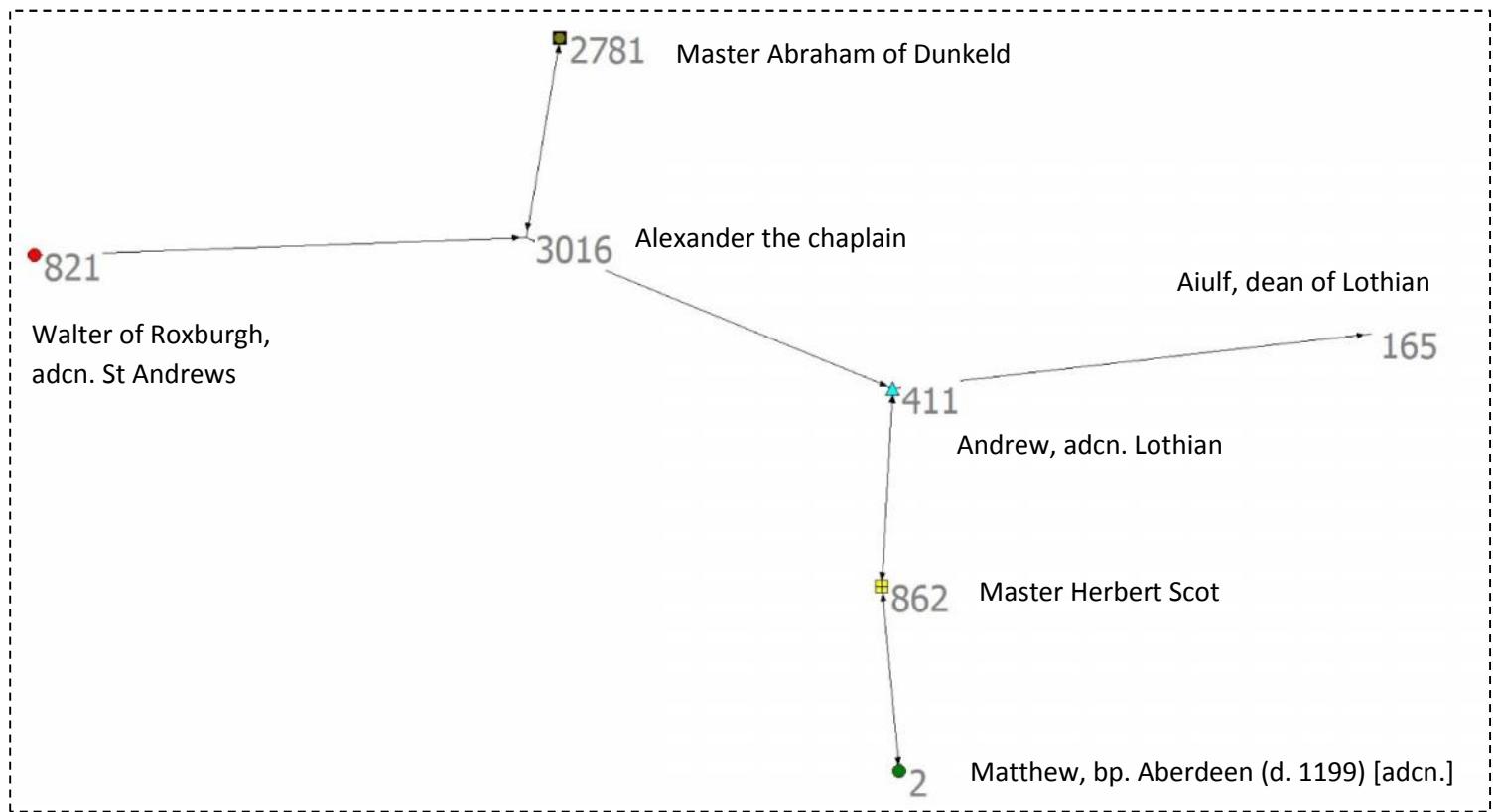
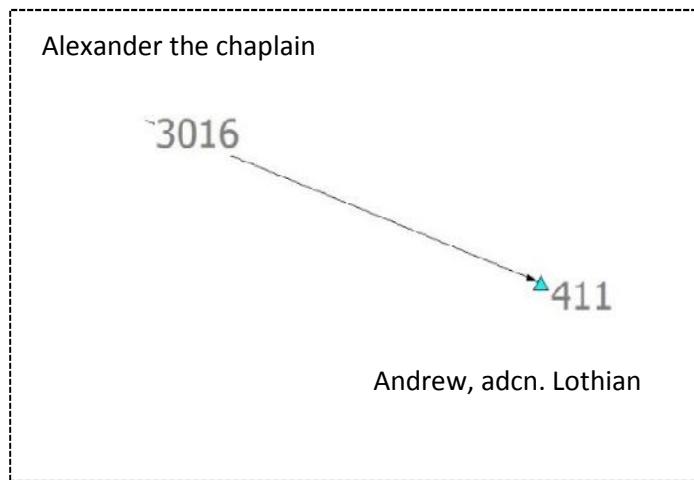


Figure 6.42. Netdraw: witnesses to H2/10 documents, >30 co-witnessing instances



References

Hammond, Matthew (2015), 'The bishop, the prior, and the founding of the burgh of St Andrews', *Innes Review* 66:1, pp. 72-101.

D. E. R. Watt (1977), *A Biographical Dictionary of Scottish Graduates to A.D. 1410*. Oxford.

2. Documents of the bishops of Glasgow (H2/7)

There were 52 documents, 50 of which were charters and two of which were notifications. There were 242 witnesses, all of them male. The network had 2147 edges.

In parallel with the charters of the bishops of St Andrews, the period in the documents of the bishops of Glasgow which jumps out in Social Network Analysis is in the mid-to-late twelfth century, although while in St Andrews the 1150s and 1160s, including the reigns of Arnold (1160-62) and Richard (1163-78) were to the fore, in Glasgow the episcopacies of Ingram (1164-74) and especially Jocelin (1175-99) seem most relevant. As with St Andrews, archdeacons, officials, deans of Christianity and other clerks and canons are among the most central players. The archdeacon Simon was in office for most of the time of both bishops Ingram and Jocelin, although while he has the highest number of co-witnessing contacts (85), it is his younger contemporary Herbert, the dean of the cathedral chapter of Glasgow from around 1180 to the 1200s, who has the highest eigenvector score. The counterpart of Alexander the chaplain at St Andrews, in terms of being a long-serving and apparently very well-connected churchman whose lack of any other title might cause him to be overlooked, is the clerk Walter, who served from the early 1170s to around 1195, and had an eigenvector of 98.5% that of Dean Herbert's.

Table 6.17. Centrality: top 15 by degree

PoMS ID	Name	Degree	Eigenvector Centrality
866	Simon, archdeacon of Glasgow (fl.1165x74-1195x96)	85	0.988227
776	John of Huntingdon, master, official of Glasgow (fl.1179x1208)	84	0.99228
2754	Walter, clerk of Bishops Ingram and Jocelin	83	0.985137
926	Elias of Partick, clerk, canon (son of Fulbert)	79	0.95064
481	Herbert, dean of Glasgow (fl.1179x89-1204x07)	77	1
1725	Bede, canon of Glasgow	73	0.975962
1718	William, canon of Glasgow, clerk	55	0.840206
2802	Peter, dean of Clydesdale and Stobo (fl.1175x95)	53	0.843521
797	Robert, archdeacon of Glasgow (d.1222)	51	0.340527
1738	Elias, canon of Glasgow (2)	47	0.733039
1124	John of Roxburgh, master, treasurer of Glasgow (d.1196)	46	0.726274
2895	John, dean of Teviotdale and Roxburgh (fl.1195-1204x07)	46	0.720881
42	William del Bois, chancellor (d.1232)	41	0.6955
774	Hugh, abbot of Newbattle (fl.1179-1201)	41	0.705128
2910	Gervase, clerk (king's and Glasgow)	41	0.711421

The most productive 'relationships' of individuals based on their co-witnessing can be viewed below. The most significant is that between Simon the archdeacon and Walter the clerk. Most of the important co-witnessing 'relationships' involve only a few key players, including Simon and Walter, as well as Herbert the dean, the clerk and canon Elias son of Fulbert, of Partick, the canon Bede, and the official Master John of Huntingdon. All of these men were active in either the reign of Bishop Herbert or Bishop Jocelin, or both.

Table 6.18. Most productive co-witnessing 'relationships' (H2/7)

Person 1	Person 2	#docs
Simon, archdeacon of Glasgow (fl.1165x74-1195x96)	Walter, clerk of Bishops Ingram and Jocelin	11
Elias of Partick, clerk, canon (son of Fulbert)	Simon, archdeacon of Glasgow (fl.1165x74-1195x96)	10
Elias of Partick, clerk, canon (son of Fulbert)	Herbert, dean of Glasgow (fl.1179x89-1204x07)	10
Bede, canon of Glasgow	Herbert, dean of Glasgow (fl.1179x89-1204x07)	10
Herbert, dean of Glasgow (fl.1179x89-1204x07)	John of Huntingdon, master, official of Glasgow (fl.1179x1208)	10
Elias of Partick, clerk, canon (son of Fulbert)	Walter, clerk of Bishops Ingram and Jocelin	9
Elias of Partick, clerk, canon (son of Fulbert)	Bede, canon of Glasgow	8
Simon, archdeacon of Glasgow (fl.1165x74-1195x96)	Herbert, dean of Glasgow (fl.1179x89-1204x07)	8
Walter, clerk of Bishops Ingram and Jocelin	Herbert, dean of Glasgow (fl.1179x89-1204x07)	8
Walter, clerk of Bishops Ingram and Jocelin	John of Huntingdon, master, official of Glasgow (fl.1179x1208)	8
Bede, canon of Glasgow	John of Huntingdon, master, official of Glasgow (fl.1179x1208)	8

Figure 6.43. Gephi: witnesses to documents of the bishops of Glasgow (H2/7)



Figure 6.44. Gephi: witnesses to H7 documents, close-up

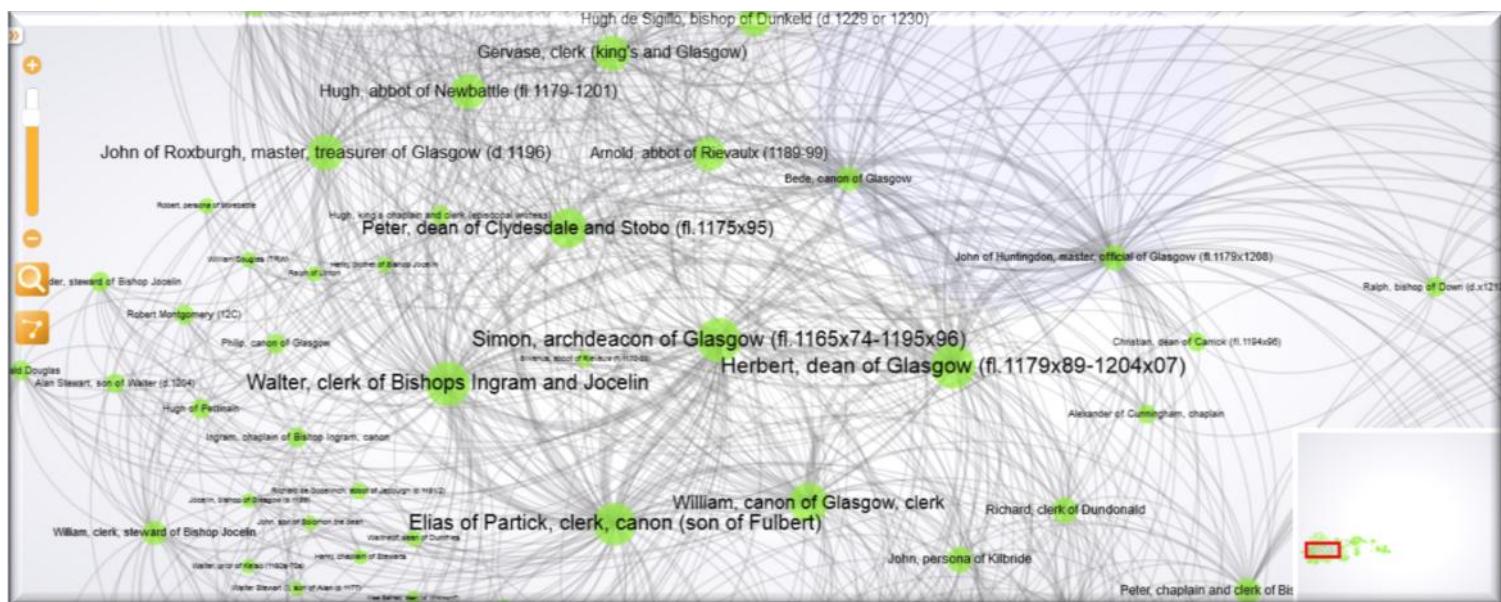


Figure 6.45. Netdraw: witnesses to H2/7 documents

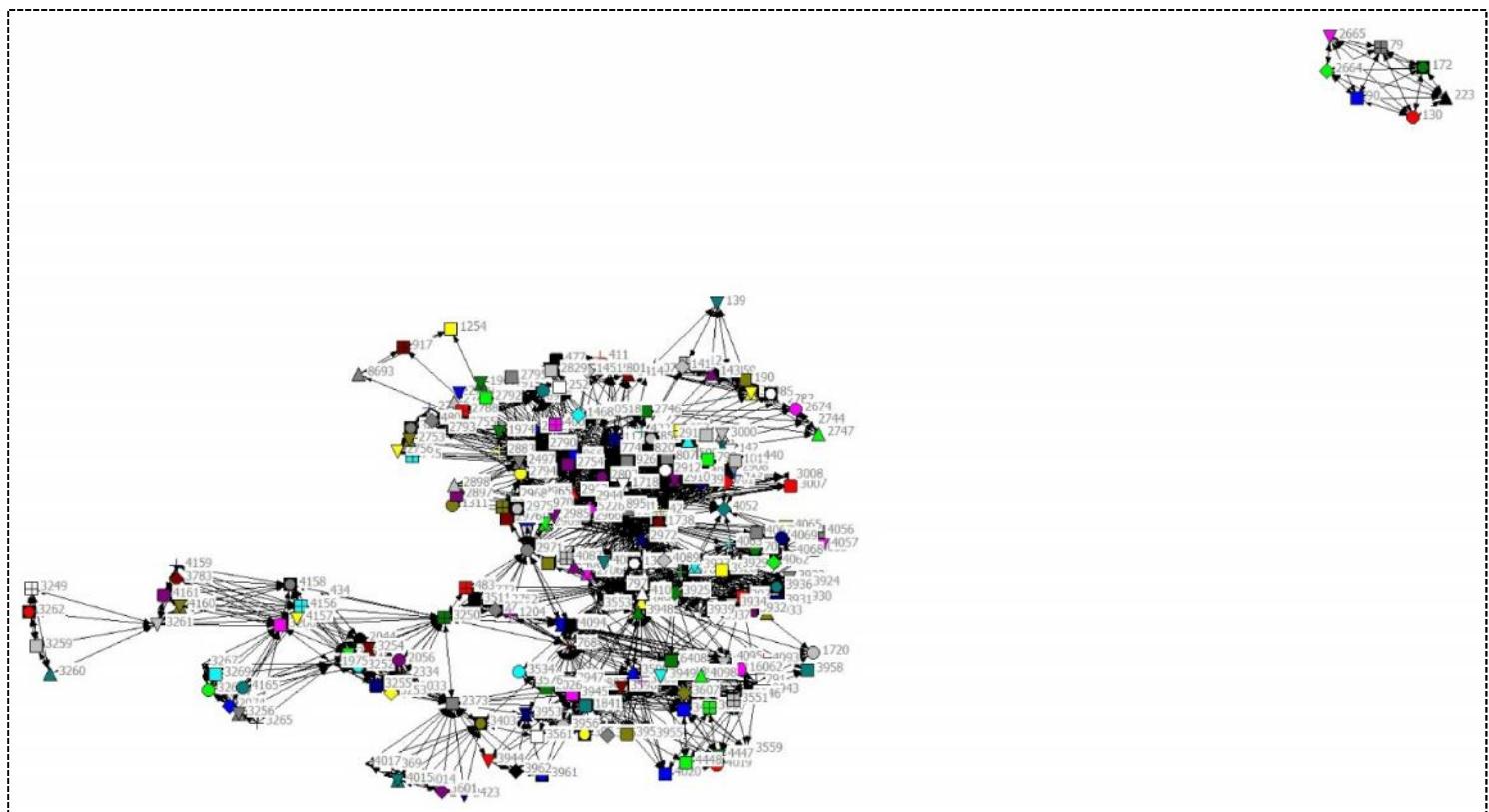
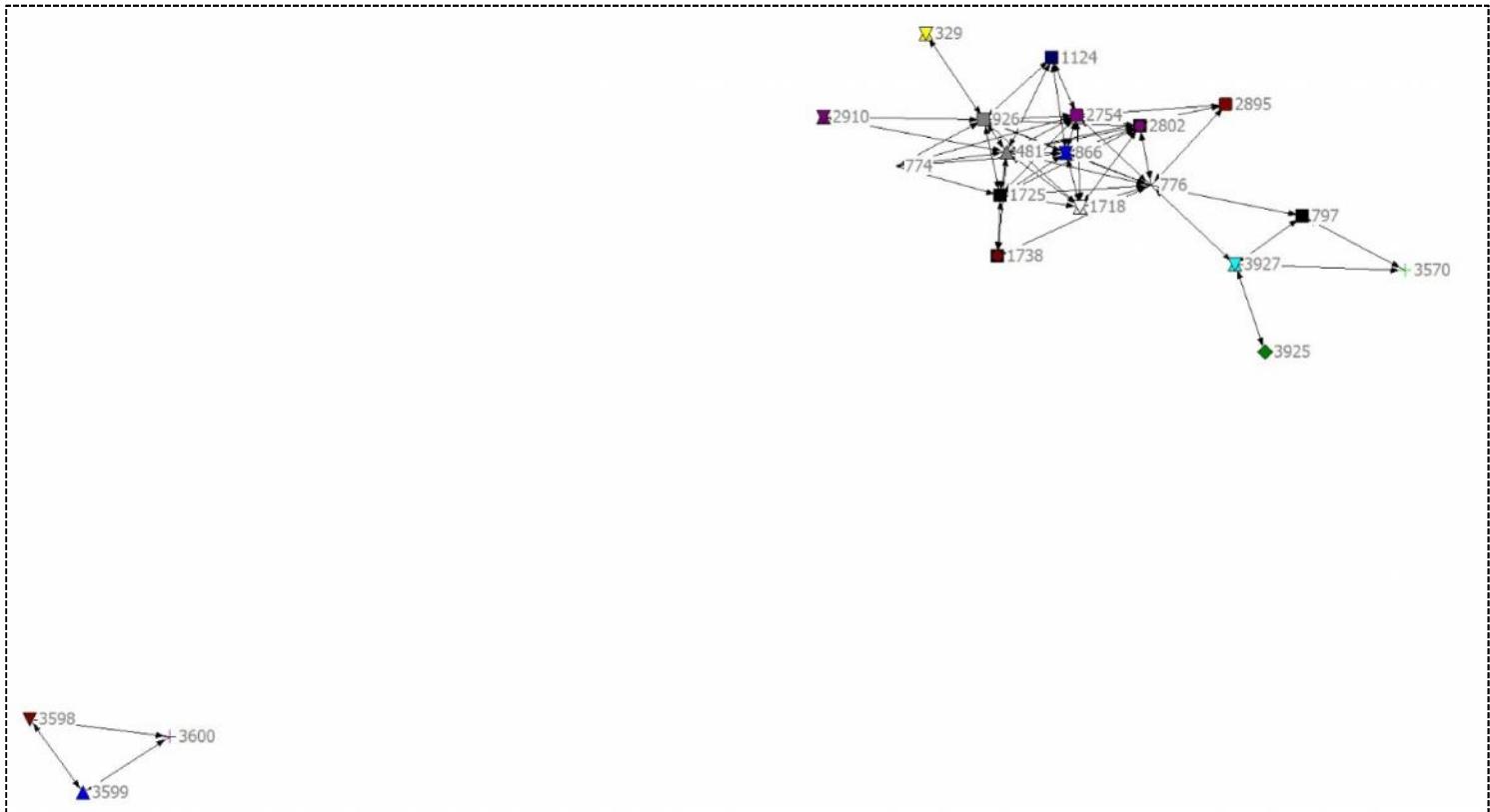


Figure 6.46. Netdraw: witnesses to H2/7 documents, >3 co-witnessing instances



The detached triad visible in the 'more than three' sociogram (Figure 6.46, above) constitutes the following individuals:

- [3598] Ralph of Braid, master
- [3599] Warin, clerk of Bishop Walter of Glasgow
- [3600] Walter, clerk of Bishop Walter of Glasgow

These are men from the time of Bishop Walter of St Albans (1207-32).

Figure 6.47. Netdraw: witnesses to H2/7 documents, >5 co-witnessing instances

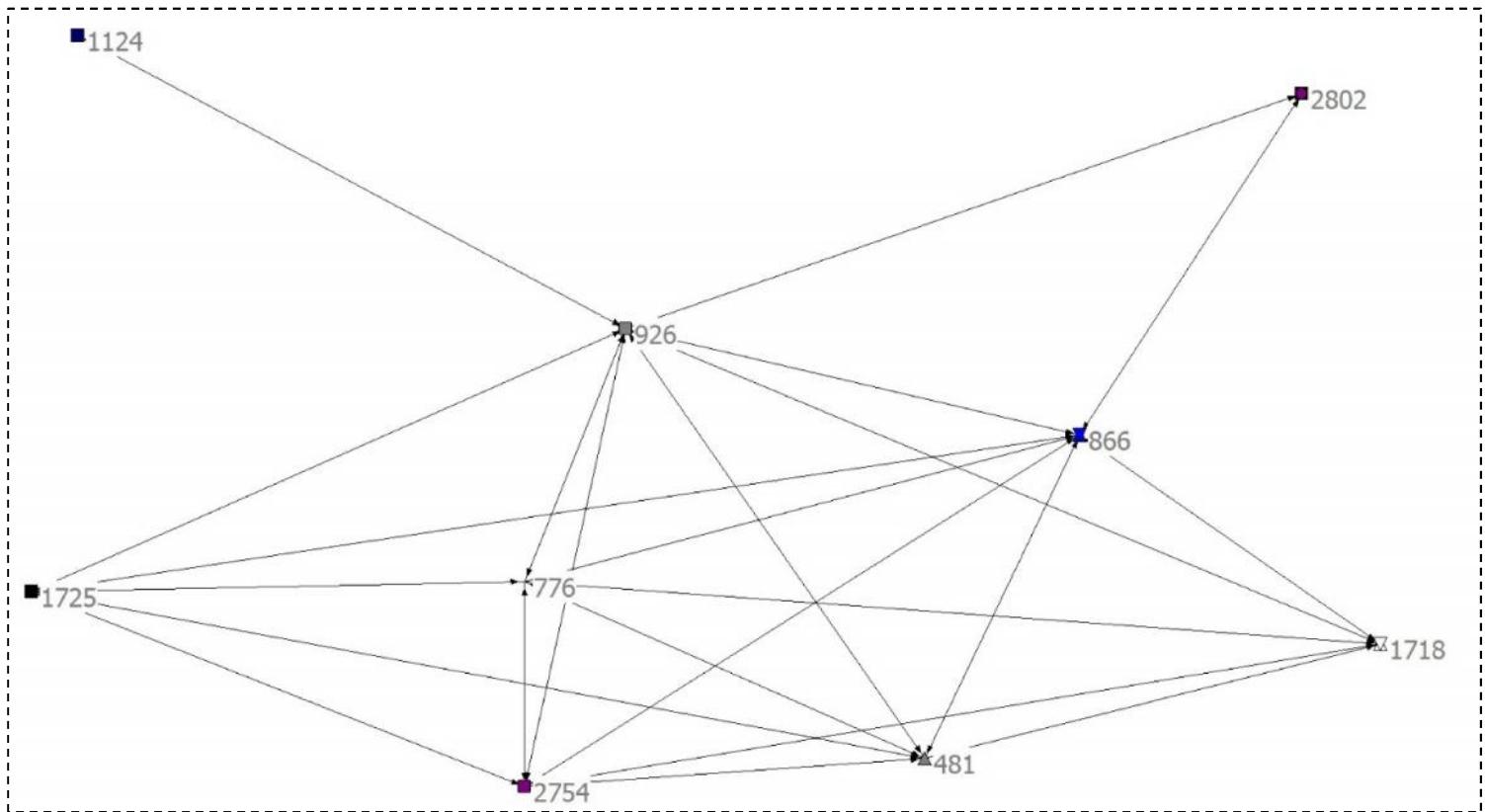


Figure 6.48. Netdraw: witnesses to H2/7 documents, >7 co-witnessing instances

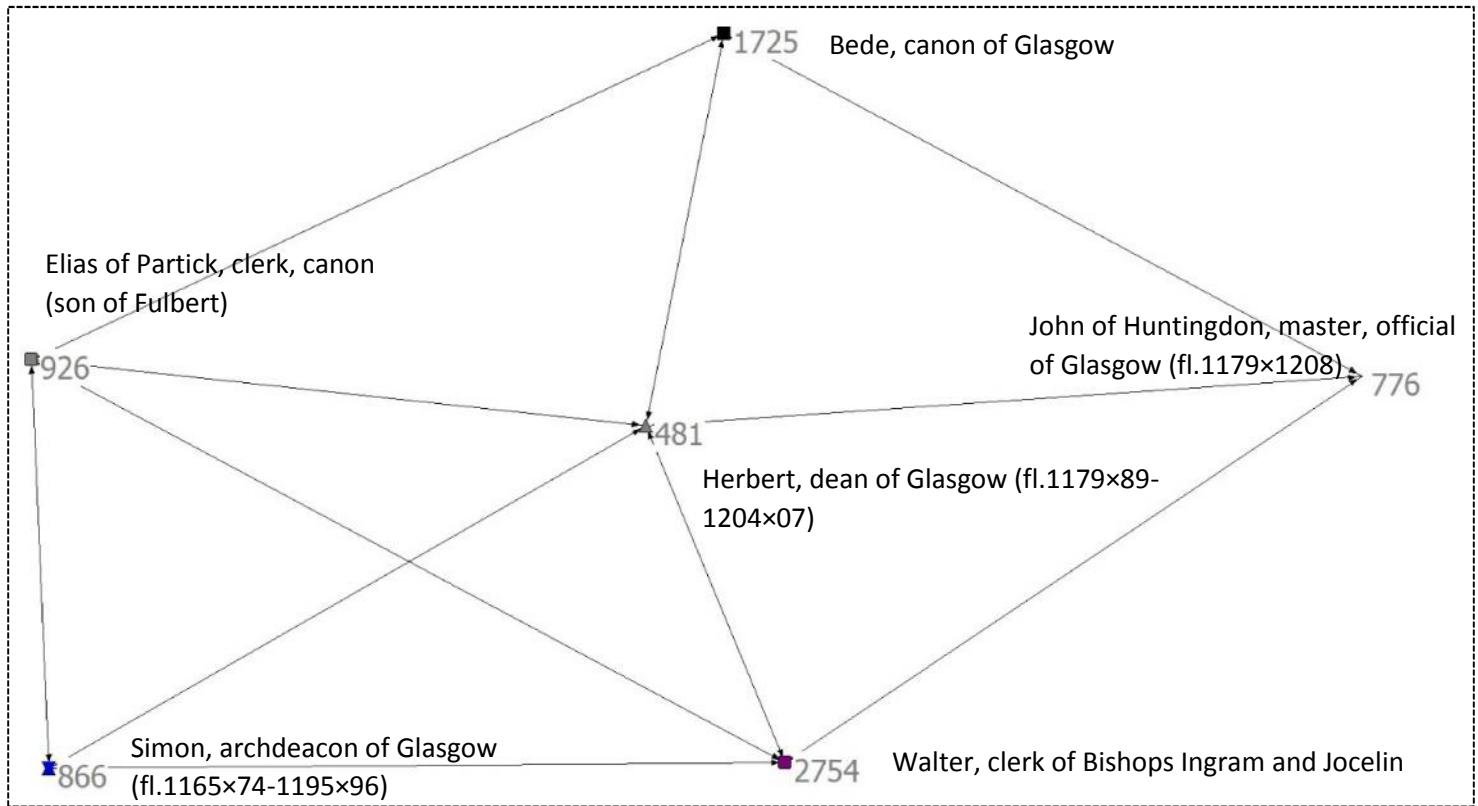
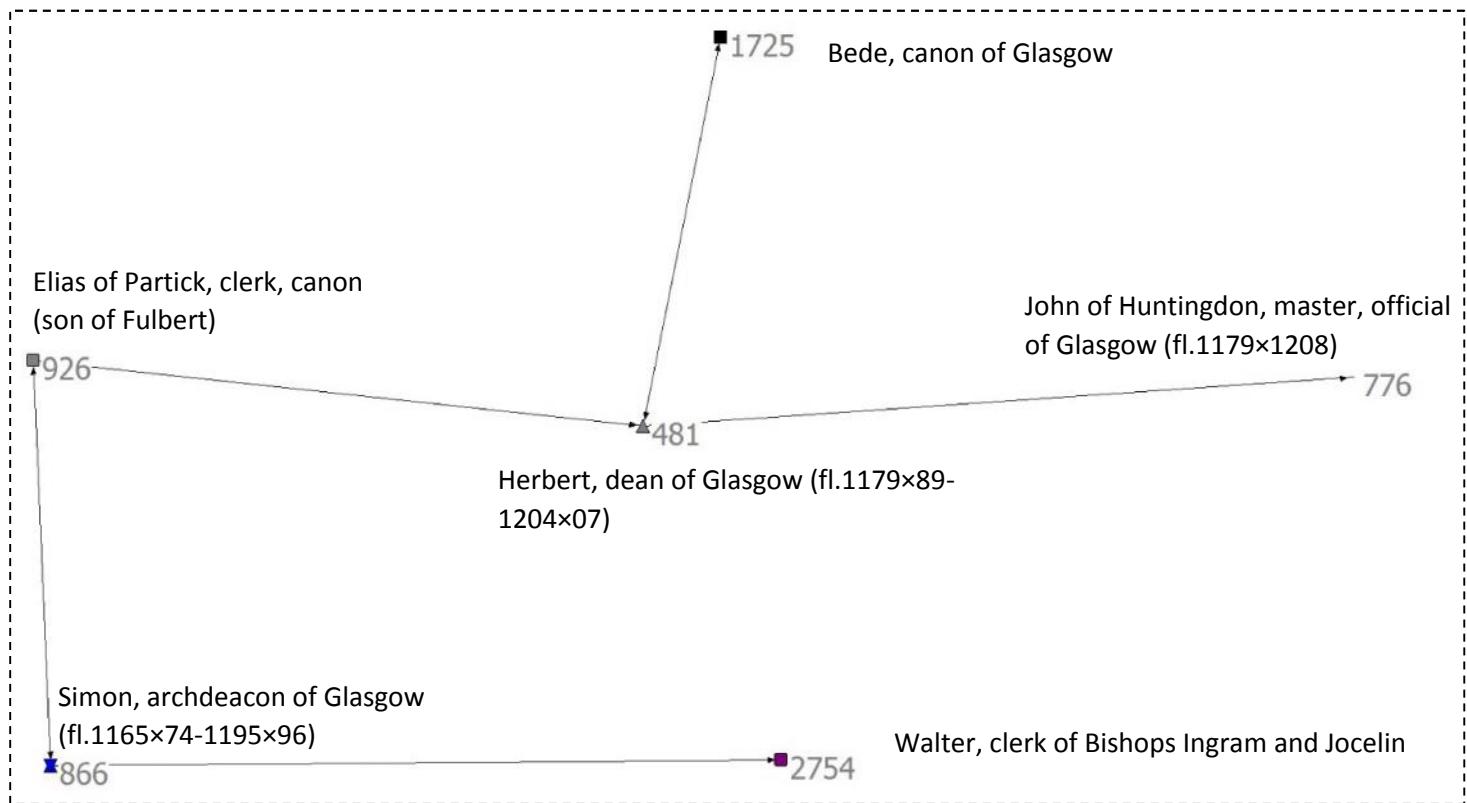


Figure 6.49. Netdraw: witnesses to H2/7 documents, >9 co-witnessing instances



3. Documents of the earls of Strathearn (H3/21)

There were 64 documents by the earls of Strathearn and their family members, defined by the H-number series 3/21. 62 of these are charters strictly speaking, one was a charter/brieve, and another a notification. There were 221 witnesses in the study, two of whom were women. There were 1765 edges in the SNA study. The period best represented among the most central individuals is the first half of the thirteenth century. Among laypeople, close relatives of the earls, as well as their stewards, have the highest centrality, while among clergy, the bishops and archdeacons of Dunblane, as well as churchmen associated with the comital caput of Crieff, are the most important. The individual with the highest centrality in terms of both degree and eigenvector was the steward Malise, son of Gilla na Naem, who witnessed charters for roughly four decades, from ca 1200 until the late 1230s. Malise's father, Gilla na Naem, and his son, Duncan, as well as the steward Brice of Dunning are also among the most central players. Other household members to appear are Henry son of Tristram, a rannaire, Joachim of Kinbuck, a knight, and William Hay, a clerk. The next highest person in terms of eigenvector comes in at only 88%, and that is Earl Gilbert of Strathearn's younger son, Malise. Other family members include Earl Gilbert's wife, Countess Matilda d'Aubigny, his sons Earl Robert, Gilbert, and

Fergus, and his brother Malise son of Earl Ferteth. Two bishops of Dunblane appear among the most central players – Abraham (1210×14 – 1223×25) and Clement (1233×58), as well as the archdeacon Gilbert. See also <http://www.poms.ac.uk/social-network-analysis/private-charter-witnesses/earls-of-strathearn-h321/>.

Table 6.19. Centrality: top 15 by degree

PoMS ID	Name	Degree	Eigenvector Centrality
3980	Malise, son of Gilla na Naem, steward of earls of Strathearn	80	1
749	Abraham, bishop of Dunblane (fl.1210×14-1220×25)	67	0.83937623
6889	Malise, son of Earl Gilbert of Strathearn (d.c.1272)	66	0.87981738
466	Gilbert, archdeacon of Dunblane (fl.1203×10-1235×39)	57	0.72994531
6976	Nicholas, son of Malise of Strathearn, chamberlain, rector of Crieff	57	0.35406347
2280	Gilbert or Gilla Brigte, son of Earl Gilbert, lord of Glencarnie (I) (d.a.1267)	55	0.71938914
3505	Robert, earl of Strathearn (1223-45)	50	0.72823605
4042	Gilla na Naem, steward of Earl Gilbert	50	0.65886962
3411	Brice, persona of Crieff	48	0.68970232
841	Malise, son of Ferteth earl of Strathearn (d.a.1214)	45	0.62328964
3497	Fergus, son of Gilbert, earl of Strathearn (d.c.1247)	45	0.72542091
4689	Duncan, son of Malise the steward	45	0.70925552
426	Matilda d'Aubigny, countess of Strathearn	44	0.61610913
1982	Clement, bishop of Dunblane (d.1258)	42	0.47514461
2360	Gilbert of Ruthven, lord of Ruthven in Strathearn	38	0.36600216
6870	Henry son of Tristram, rannaire	38	0.5844178
6974	Joachim of Kinbuck, knight	38	0.37305406
6950	Brice of Dunning, thane of Dunning, steward	37	0.45100816
6912	William Hay, clerk of earls of Strathearn	35	0.52871408

The most well-recorded co-witnessing ‘relationships’ involved churchmen. Of the 11 relationships which involved co-witnessing ten or more times, Bishop Abraham was a party to five of them, archdeacon Gilbert and Brice persona of Crieff were party to two each. These relationships attest to the exceptional production and survival of charters in the final two decades of Earl Gilbert’s tenure, roughly the first two decades of the thirteenth century. Thus we have Earl Gilbert’s brother, Malise, his son, Robert, and his steward, Malise, being represented so generously in this table.

Table 6.20. Most productive co-witnessing 'relationships' (H3/21)

Person 1	Person 2	#docs
Abraham, bishop of Dunblane (fl.1210×14-1220×25)	Malise, son of Gilla na Naem, steward of earls of Strathearn	17
Abraham, bishop of Dunblane (fl.1210×14-1220×25)	Brice, persona of Crieff	14
Abraham, bishop of Dunblane (fl.1210×14-1220×25)	Gilbert, archdeacon of Dunblane (fl.1203×10-1235×39)	12
Malise, son of Gilla na Naem, steward of earls of Strathearn	Brice, persona of Crieff	11
Malise, son of Gilla na Naem, steward of earls of Strathearn	Gilbert, archdeacon of Dunblane (fl.1203×10-1235×39)	11
Robert, earl of Strathearn (1223-45)	Abraham, bishop of Dunblane (fl.1210×14-1220×25)	11
Robert, earl of Strathearn (1223-45)	Malise, son of Gilla na Naem, steward of earls of Strathearn	11
Gilla na Naem, steward of Earl Gilbert	Malise, son of Ferteth earl of Strathearn (d.a.1214)	10
Malise, son of Ferteth earl of Strathearn (d.a.1214)	Constantine, judex (PER)	10
Abraham, bishop of Dunblane (fl.1210×14-1220×25)	Fergus, son of Gilbert, earl of Strathearn (d.c.1247)	10
Malise, son of Gilla na Naem, steward of earls of Strathearn	Malise, son of Earl Gilbert of Strathearn (d.c.1272)	10

Figure 6.50. Gephi: witnesses to documents of the earls of Strathearn (H3/21)

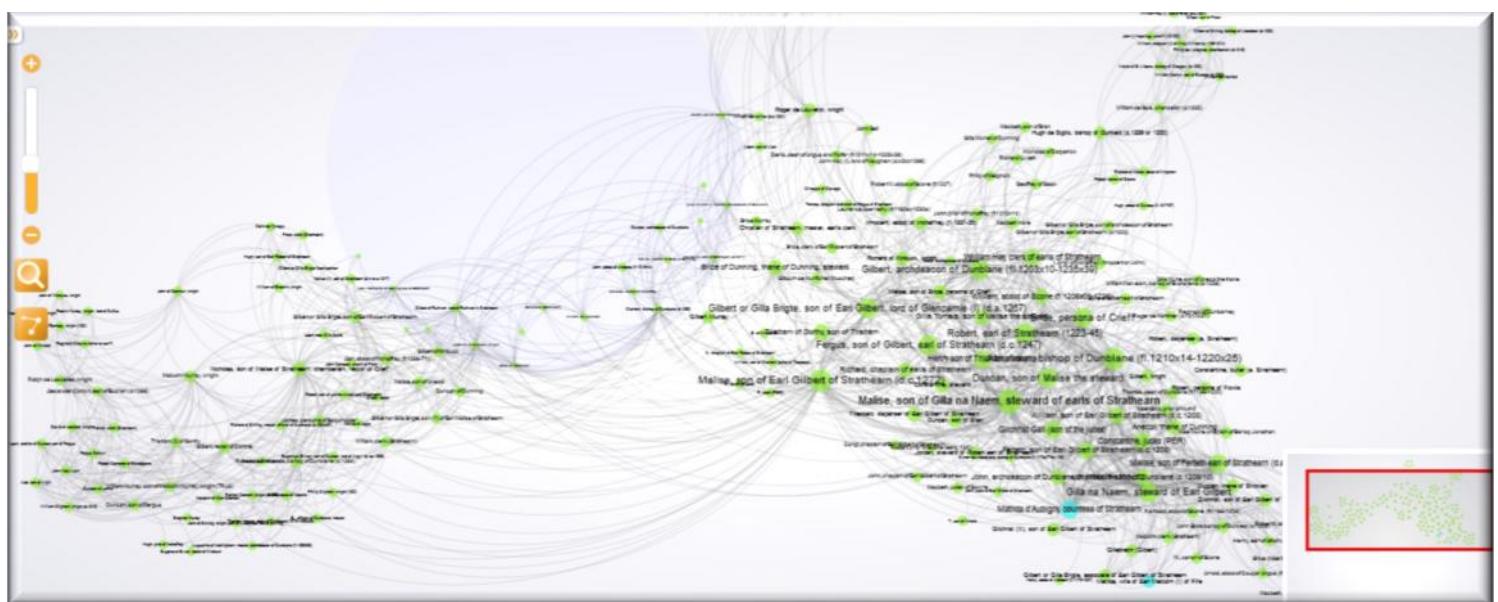


Figure 6.51. Gephi: witnesses to H3/21 documents, close-up

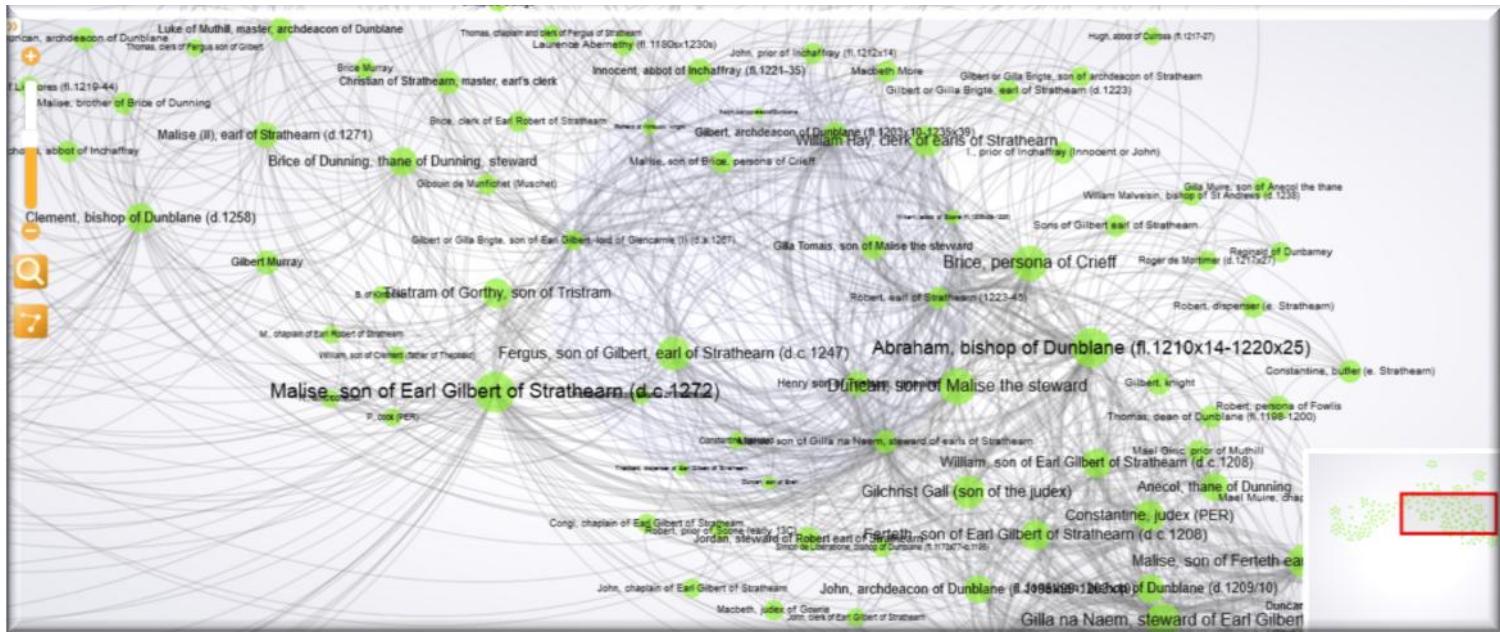
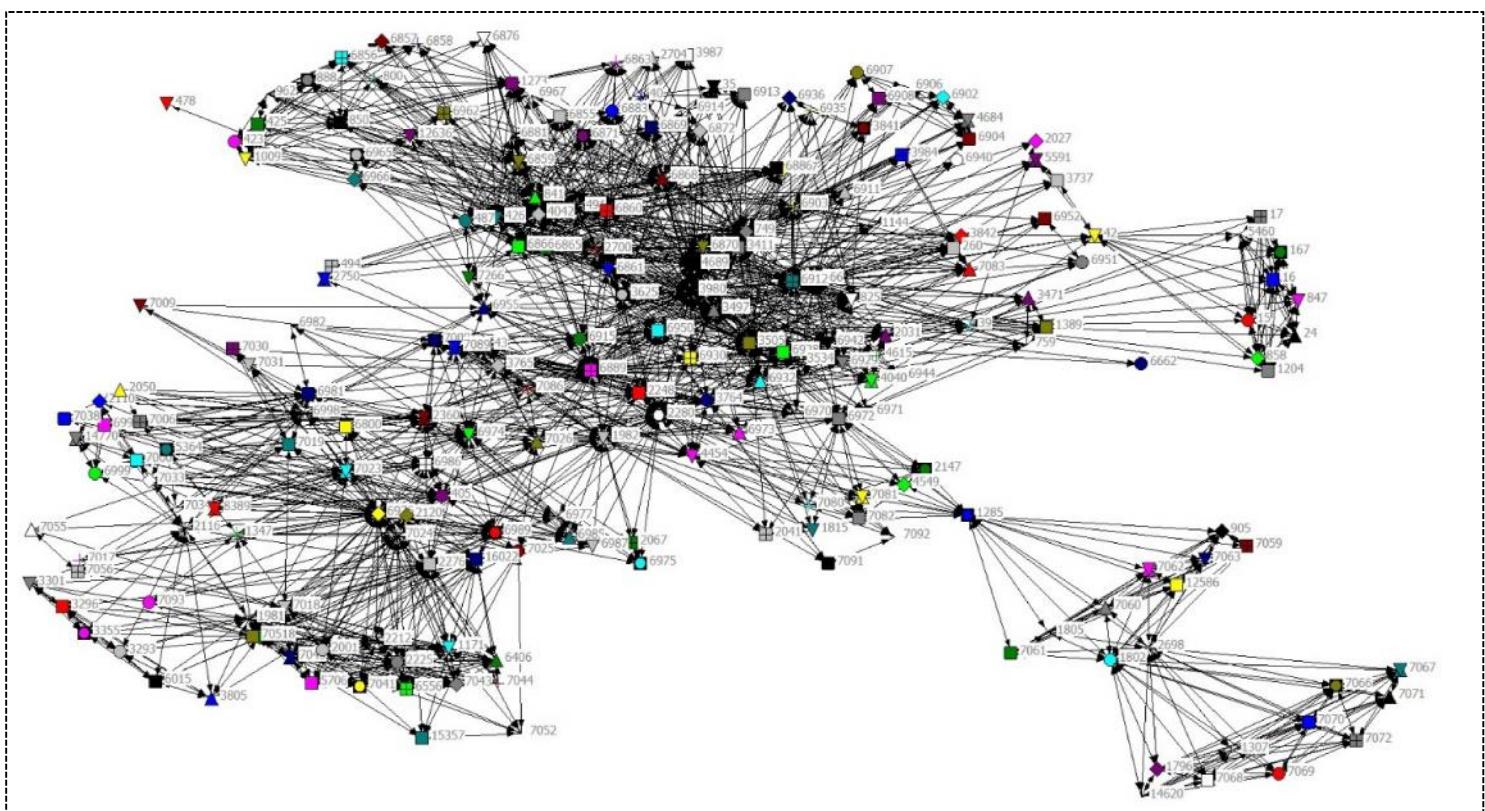


Figure 6.52. Netdraw: witnesses to H3/21 documents



The sociogram of more than 3 co-witnessing acts reveals the richness of the evidence for the early thirteenth century, whether in abundance or interconnectedness, compared to the later material. Earl Gilbert's son Malise [6889] is a vital connector to the later generations, represented by Bishop Clement [1982] and the knight Joachim of Kinbuck [6974]. The early thirteenth century period is explored in greater detail in the sociograms of individuals who co-witnessed more than seven and more than ten times, respectively.

Figure 6.53. Netdraw: witnesses to H3/21 documents, >3 co-witnessing instances

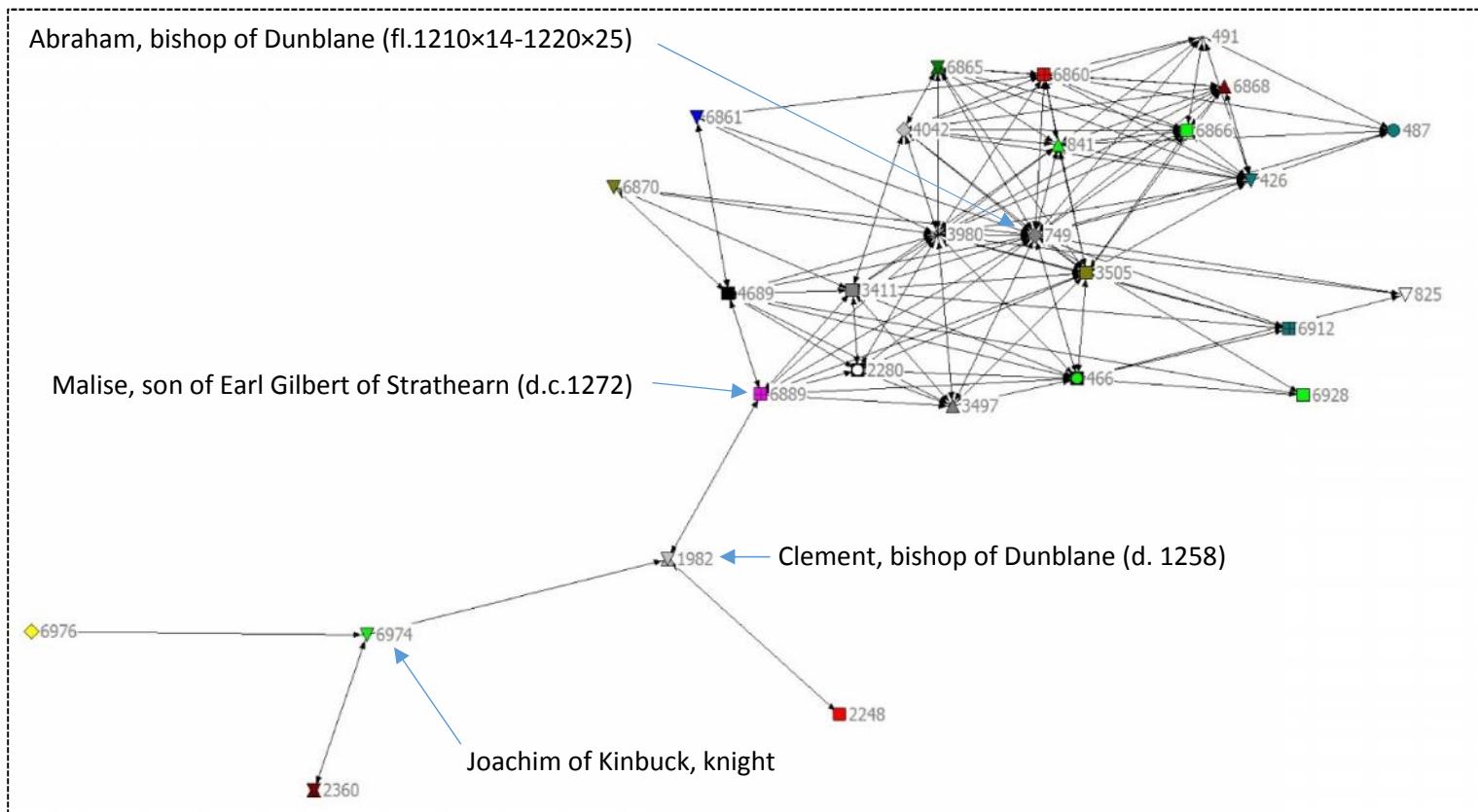


Figure 6.54. Netdraw: witnesses to H3/21 documents, >5 co-witnessing instances

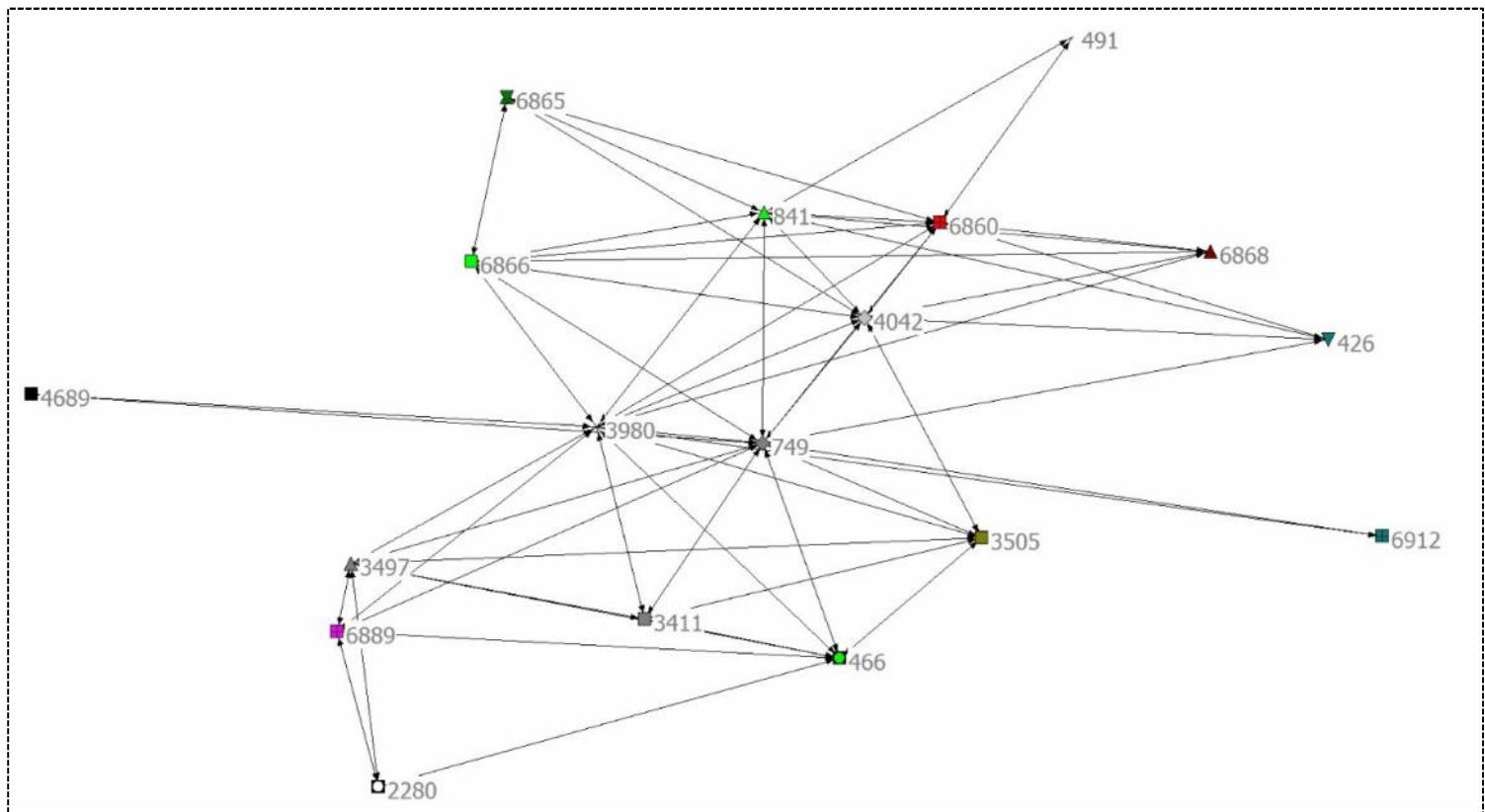


Figure 6.55. Netdraw: witnesses to H3/21 documents, >7 co-witnessing instances

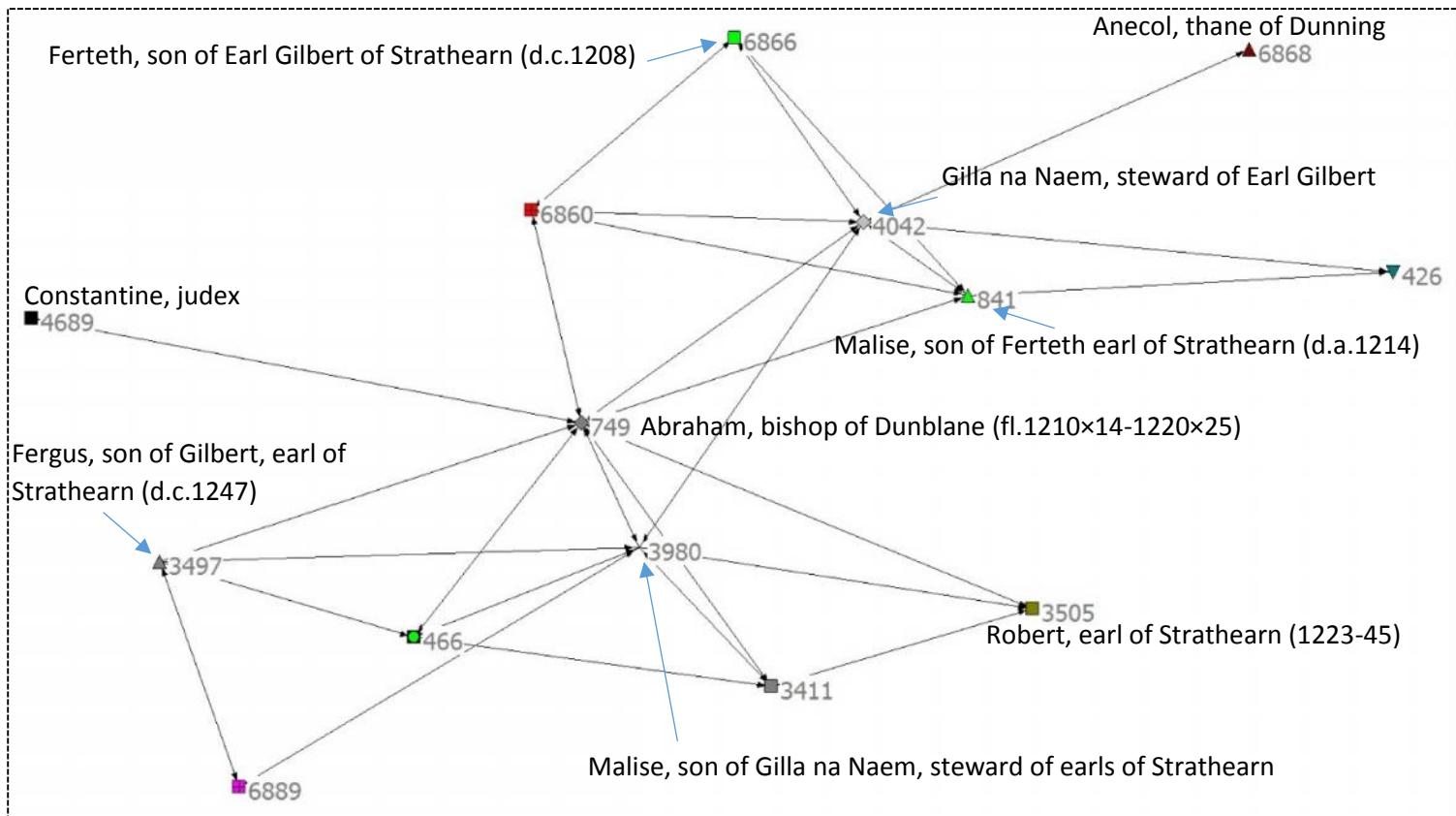
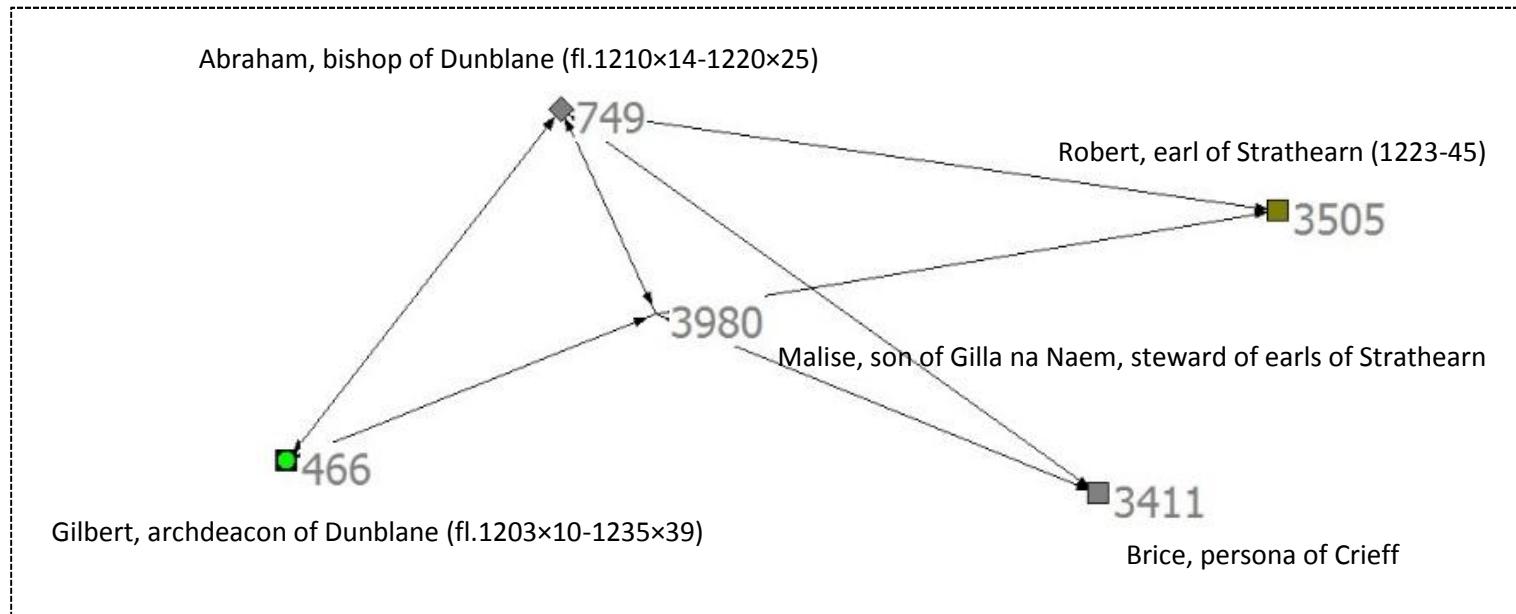


Figure 6.56. Netdraw: witnesses to H3/21 documents, >10 co-witnessing instances



4. Documents of the earls of Dunbar (H3/15)

There were 73 documents in the H3/15 series, representing the earls of Dunbar and their family. Of these one was a notification, the rest were charters. There were 362 witnesses –far more than in the Strathearn study. Three of these were women, all of whom were countesses. There were 3094 edges. See also <http://www.poms.ac.uk/social-network-analysis/private-charter-witnesses/earls-of-dunbar-h315/>

Figure 6.57. Gephi: witnesses to documents of the earls of Dunbar (H3/15).

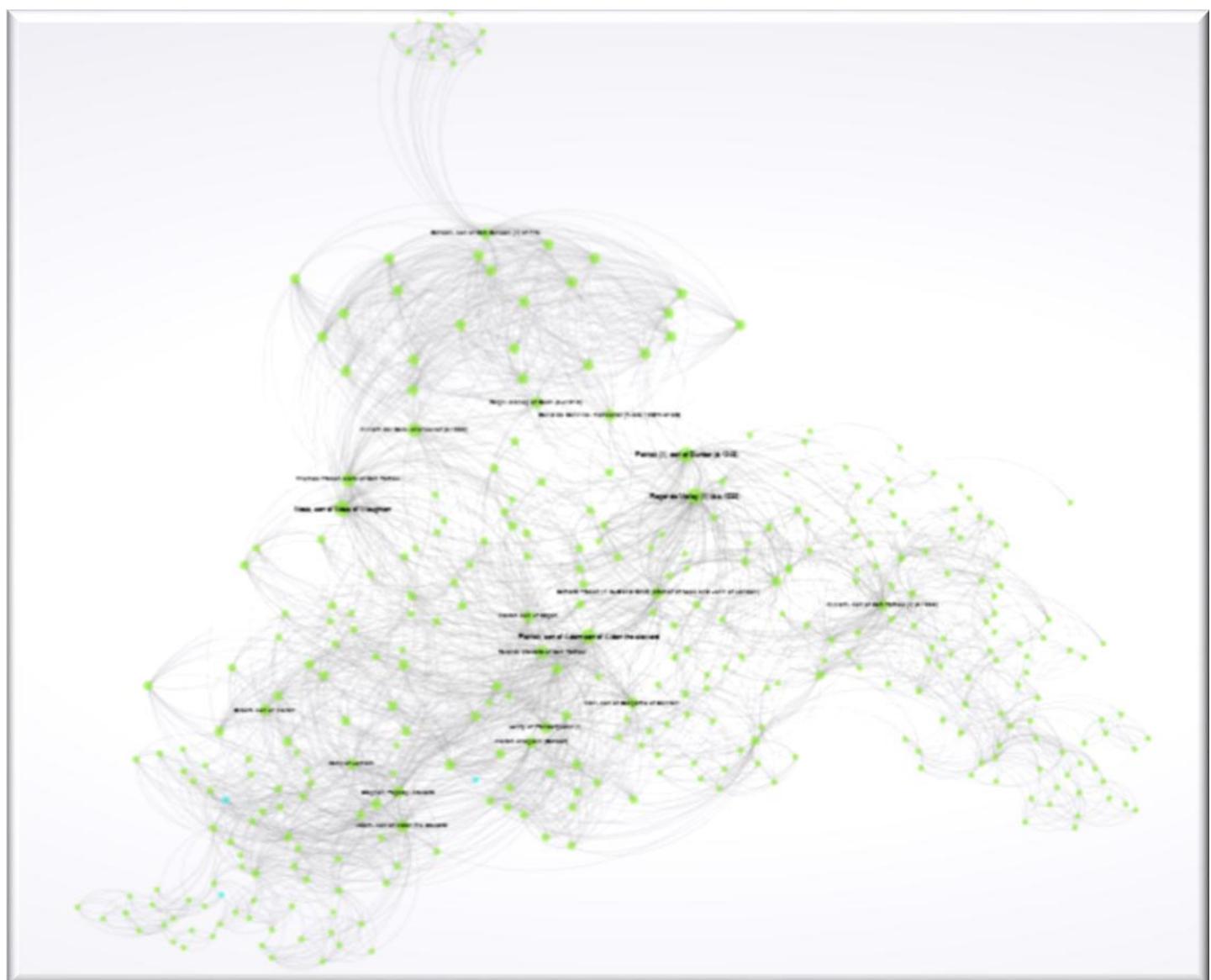
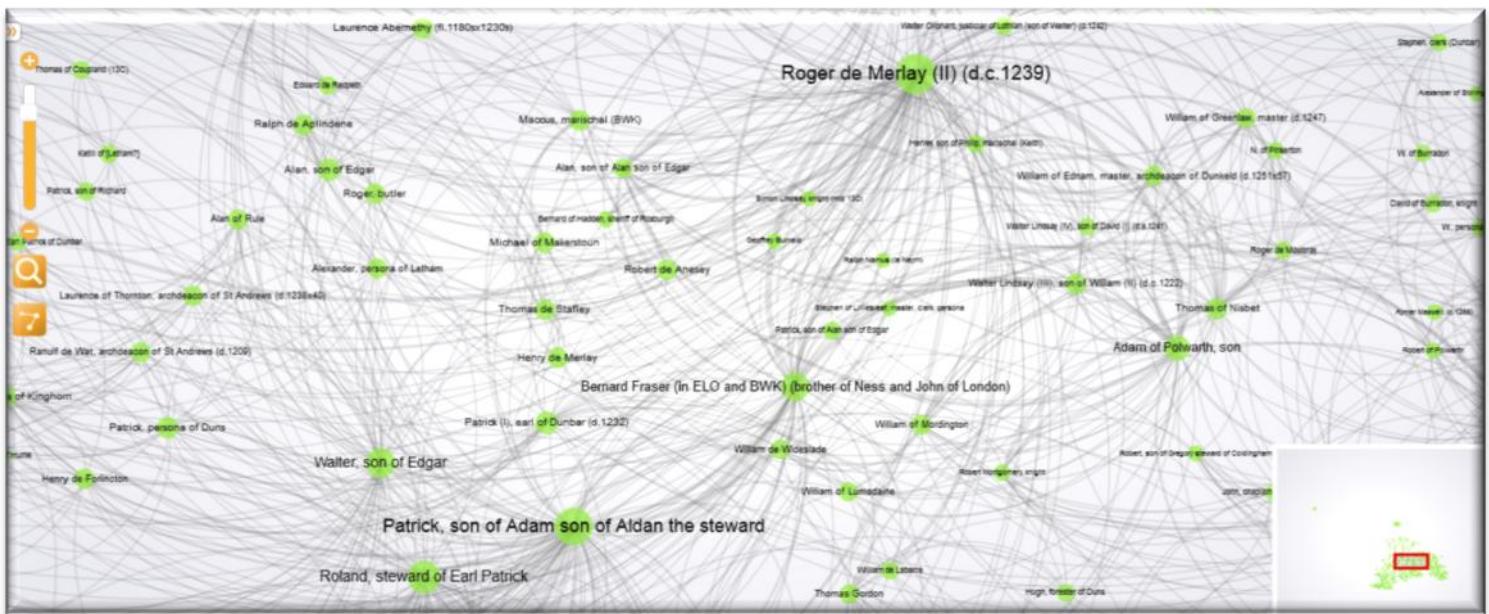


Figure 6.58. Gephi: witnesses to H3/15 documents, close-up



As with the Strathearn comital charters, the most prominent witnesses were family members and stewards. Indeed, stewards appear as even more important figures in the Dunbar charters. Roger de Merlay (no 1 – degree and eigenvector), Roland (no. 10 degree/ no. 7 eigenvector), and Stephen Papedy (no. 8 degree/ no. 10 eigenvector) were all stewards of Earl Patrick (I) at various points. The descendants of Aldan, who had been steward in the 1150s and 1160s, also remained very central to Dunbar earldom politics. Adam son of Aldan (no. 5 degree/ no. 8 eigenvector) and his son Patrick (no. 3 degree/ no. 4 eigenvector) seem to have maintained great importance despite apparently not holding onto the stewardship. The main family members to appear were Earl Patrick (I)'s sons Earl Patrick (II) [445] and William [4427]. Walter son of Edgar was also part of the comital kindred, as Edgar was Earl Patrick (I)'s great-uncle and a brother of the aforementioned Juliana. Other household members include a chaplain, Walter, and a clerk, Thomas Fraser. The family grouping which included the Frasers, Londons and Waughtons were prominent vassals, as was Ketill of Letham, whose name comes from the place now known as Leithholm near Coldstream.

Table 6.21. Centrality: top 15 by degree

PoMS ID	Name	Degree	Eigenvector
5781	Roger de Merlay (II) (d.c.1239) [steward]	110	1
445	Patrick (II), earl of Dunbar (d.1248)	93	0.915282
3149	Patrick, son of Adam son of Aldan the steward	92	0.906805
5798	Ness, son of Ness of Waughton	85	0.997628
4814	Adam, son of Aldan the Steward	78	0.668521
5787	Thomas Fraser, clerk of Earl Patrick	69	0.806917
4427	William, son of Earl Patrick (I) (d.1253)	67	0.477417
5912	Stephen Papedy, steward	67	0.571868
11520	Bernard Fraser (in ELO and BWK) (brother of Ness and John of London)	64	0.535782
5923	Roland, steward of Earl Patrick	60	0.698131
5925	Walter, chaplain (Dunbar)	58	0.524842
5789	Walter, son of Edgar	56	0.567614
5884	Ketill of Letham	54	0.478773
5901	Gilbert, son of Walter	54	0.548779
42	William del Bois, chancellor (d.1232)	53	0.766029

The most well-represented co-witnessing relationships involve some of the lay players already mentioned, including Bernard Fraser, Roger de Merlay (II), Patrick (II), earl of Dunbar, and his brother William. The only 'surprise' in the table below is the importance of Adam of Polwarth, son [2150], whose eigenvector was only about 40%, but who witnessed ten charters in the H3/15 series during the later part of the tenure of Earl Patrick (I). Polwarth is located in central Berwickshire and may have been held from the earl.

Table 6.22. Most productive co-witnessing 'relationships' (H3/15)

Person 1	Person 2	#docs
Bernard Fraser (in ELO and BWK) (brother of Ness and John of London)	Roger de Merlay (II) (d.c.1239)	9
Roger de Merlay (II) (d.c.1239)	Adam of Polwarth, son	9
Bernard Fraser (in ELO and BWK) (brother of Ness and John of London)	Adam of Polwarth, son	8
Patrick (II), earl of Dunbar (d.1248)	Roger de Merlay (II) (d.c.1239)	7
Patrick (II), earl of Dunbar (d.1248)	William, son of Earl Patrick (I) (d.1253)	7
Bernard Fraser (in ELO and BWK) (brother of Ness and John of London)	William, son of Earl Patrick (I) (d.1253)	6
Patrick (II), earl of Dunbar (d.1248)	Thomas Fraser, clerk of Earl Patrick	6
Roger de Merlay (II) (d.c.1239)	Patrick, son of Adam son of Aldan the steward	6
Roger de Merlay (II) (d.c.1239)	Thomas Fraser, clerk of Earl Patrick	6

Figure 6.59. Netdraw: witnesses to H3/15 documents

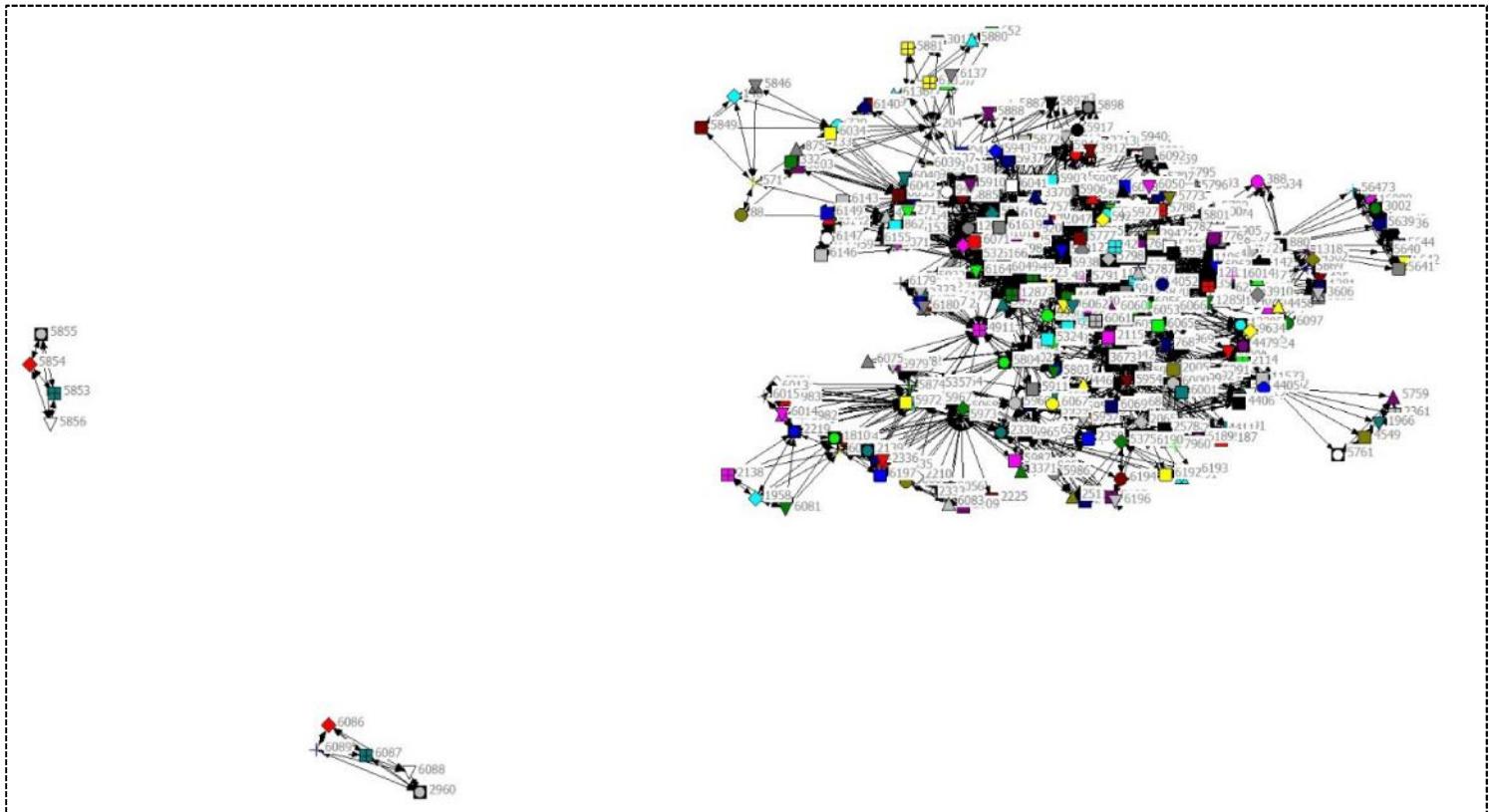


Figure 6.60. Netdraw: witnesses to H3/21 documents, >3 co-witnessing instances

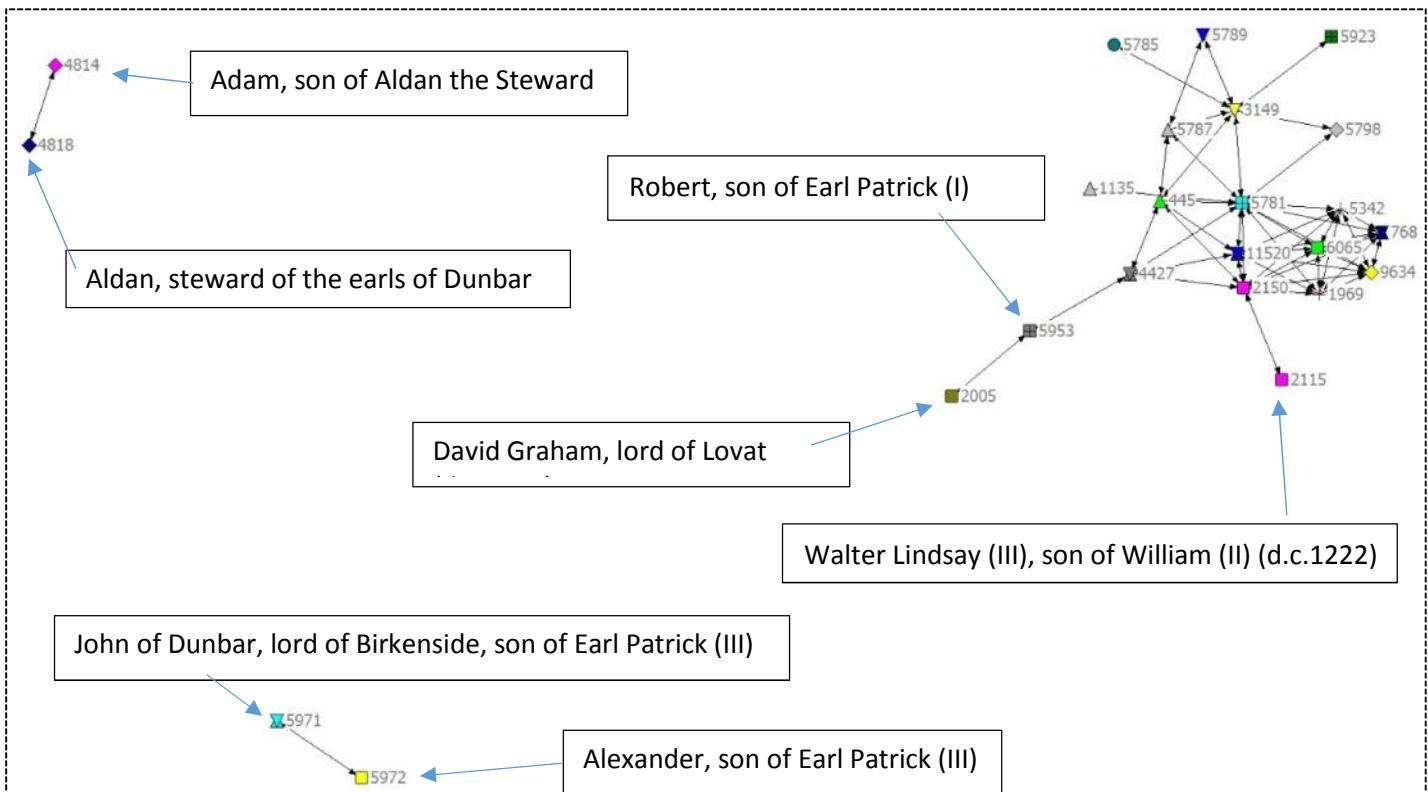


Figure 6.61. Netdraw: witnesses to H3/21 documents, >5 co-witnessing instances

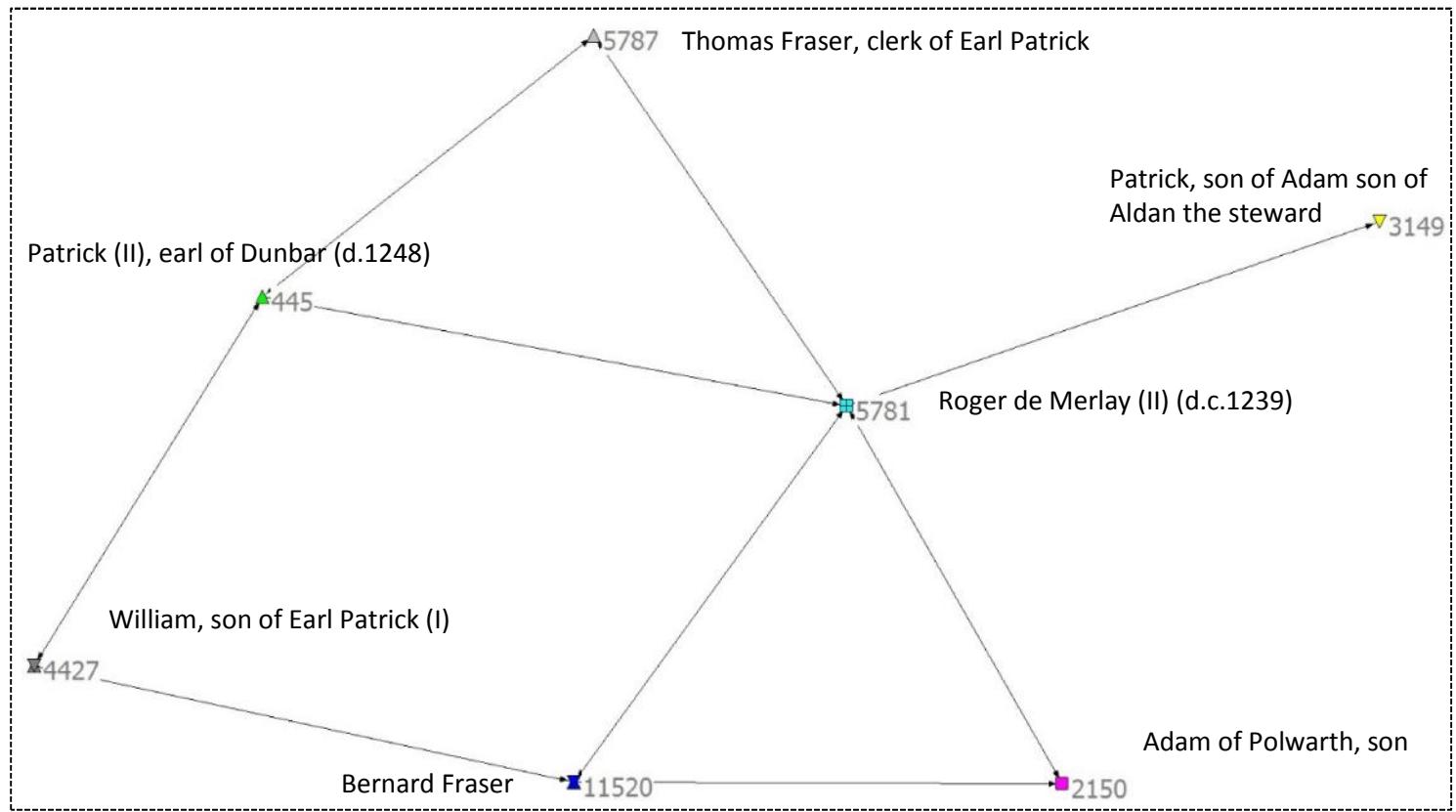
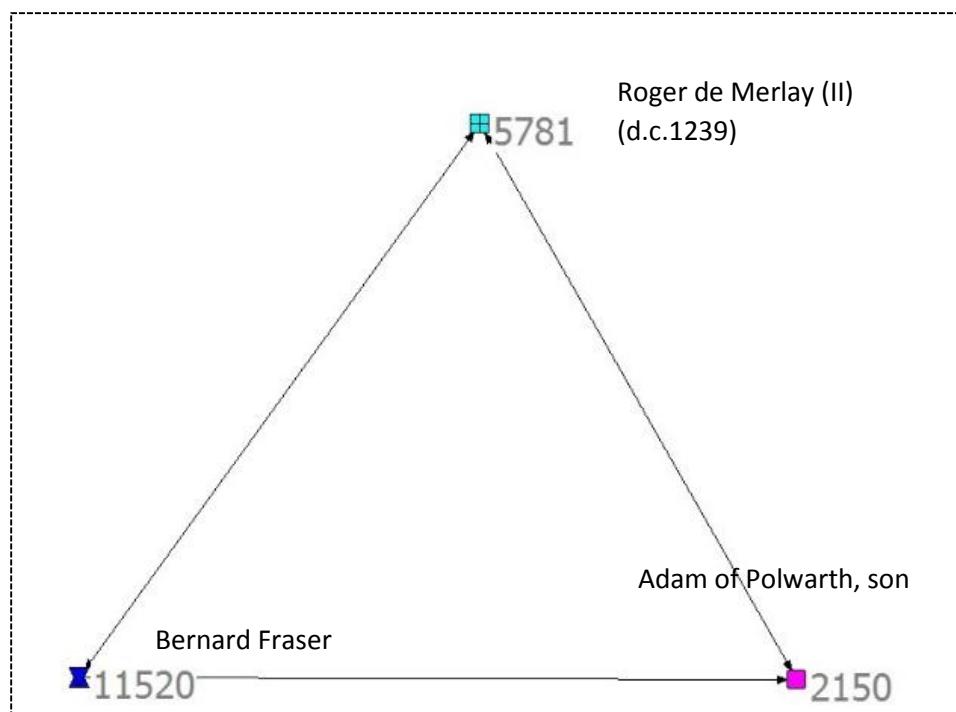


Figure 6.62. Netdraw: witnesses to H3/21 documents, >7 co-witnessing instances



PART FIVE: BENEFICIARY CASE STUDIES

1. Melrose Abbey

The studies of co-witnessing so far have all been defined by categories based on the grantors of documents, but it is also possible to define case studies based on the beneficiary. Two examples are presented here: witnesses of documents for Melrose Abbey and for Arbroath Abbey, respectively. Melrose abbey was the beneficiary of 224 documents, all of which were charters strictly speaking (agreements with Melrose abbey have not been included here). There were 1017 witnesses connected by 10,570 edges in the study. The witnesses included three women. Of the 224 documents, 51 (22.8%) were royal, only 12 (5.4%) were by ecclesiastical grantors (H2), and 161 (71.9%) were by various sorts of lay grantors.

Jocelin, bishop of Glasgow (1175-99), in whose diocese Melrose lay, and who was himself a former abbot of Melrose, had by far the highest number of co-witnessing contacts, with a degree of 209. David, earl of Huntingdon (d. 1219) had the next highest degree (161) and the highest eigenvector score. Other Glasgow diocesan figures were very central in the Melrose abbey collection, including Simon, who was archdeacon during Jocelin's episcopate, and Master John of Huntingdon, who was the official. The episcopal clerks Walter [2754] and William [2790] also appeared in the top ten by degree. Among laymen, the sheriffs of Roxburgh John Maxwell [1281] and Bernard of Hadden [880] had relatively high degree centralities but unimpressive eigenvector scores of 35-40%. John Maxwell, however, had the highest betweenness centrality in the sociogram. While the most central figures were flourishing in the last quarter of the twelfth century, there is a fairly broad chronological range of individuals in the table of people in the top twenty by degree.

Table 6.23: Centrality: top 15 by degree

Poms ID	Person	Degree	Eigenvector Centrality	Betweenness Centrality
745	Jocelin, bishop of Glasgow (d.1199)	209	0.969433071	55190.43371
142	David, earl of Huntingdon (d.1219)	161	1	26227.10592
866	Simon, archdeacon of Glasgow (fl.1165×74-1195×96)	140	0.848563015	11006.40339
776	John of Huntingdon, master, official of Glasgow (fl.1179×1208)	137	0.688349335	22666.81229
1281	John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	130	0.407692642	60477.63221
6060	Richard Nanus (le Nain)	114	0.46908129	26571.6271

15	Philip de Valognes, chamberlain (d.1215)	113	0.63269506	15362.94205
445	Patrick (II), earl of Dunbar (d.1248)	108	0.391641716	17738.12463
880	Bernard of Hadden, sheriff of Roxburgh	105	0.353307883	20098.24645
933	William of Hownam, son of John, son of Orm (d.1227)	102	0.476722667	15147.95263
42	William del Bois, chancellor (d.1232)	101	0.590488655	7613.795735
854	Gervase Avenel, lord of Eskdale (d.1219)	100	0.582574526	18122.57857
2754	Walter, clerk of Bishops Ingram and Jocelin	100	0.647206876	3278.949697
1285	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	99	0.392555123	30344.93552
2790	William, clerk, steward of Bishop Jocelin	97	0.554695951	3657.78061
184	William de Somerville (I)	93	0.431304755	19958.59327
5781	Roger de Merlay (II) (d.c.1239)	93	0.318427303	27997.45148
3	Walter Stewart (I), son of Alan (d.1177)	91	0.496810807	13968.61104
797	Robert, archdeacon of Glasgow (d.1222)	90	0.499233889	9964.892652
13	Duncan (II), earl of Fife (d.1204)	89	0.522867701	4693.755745

The table of the most productive co-witnessing ‘relationships’ is an odd mélange, including Glasgow diocesan figures, members of the Ryedale family, earls of Dunbar, sheriffs of Roxburgh, and individuals from the founding era and first generation of the abbey’s existence, like David I’s constable, Hugh de Moreville, Bishop John of Glasgow, and William de Somerville. These represent various pockets of charter producing activity from different points in the abbey’s history.

Table 6.24: Most productive co-witnessing ‘relationships’ (Melrose abbey)

Person1	Person2	Weight
Jocelin, bishop of Glasgow (d.1199)	Simon, archdeacon of Glasgow (fl.1165x74-1195x96)	11
Walter, son of Patrick of Ryedale	Ralph of Ryedale	11
Ralph of Ryedale	Robert of Barnoldby	11
Patrick (I), earl of Dunbar (d.1232)	Patrick (II), earl of Dunbar (d.1248)	9
John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	Walter Oliphant, justiciar of Lothian (son of Walter) (d.1242)	9
John Maxwell, chamberlain, sheriff of Roxburgh (d.1241)	Bernard of Hadden, sheriff of Roxburgh	9
Walter, son of Patrick of Ryedale	Robert of Barnoldby	9
Hugh de Moreville (I) (d.1162)	William de Somerville (I)	8
Hugh de Moreville (I) (d.1162)	John, bishop of Glasgow (d.1147)	8
Hugh de Moreville (I) (d.1162)	Gervase Ridle, sheriff of Roxburgh (TRD)	8
John, bishop of Glasgow (d.1147)	Gervase Ridle, sheriff of Roxburgh (TRD)	8
Bernard of Hadden, sheriff of Roxburgh	William of Hownam, son of John, son of Orm (d.1227)	8
Richard Nanus (le Nain)	Ralph of Ryedale	8
Adam of Chatto	Ralph of Ryedale	8
Adam of Whitton	Ralph of Ryedale	8

Figure 6.63. Netdraw: witnesses to Melrose abbey beneficiary documents

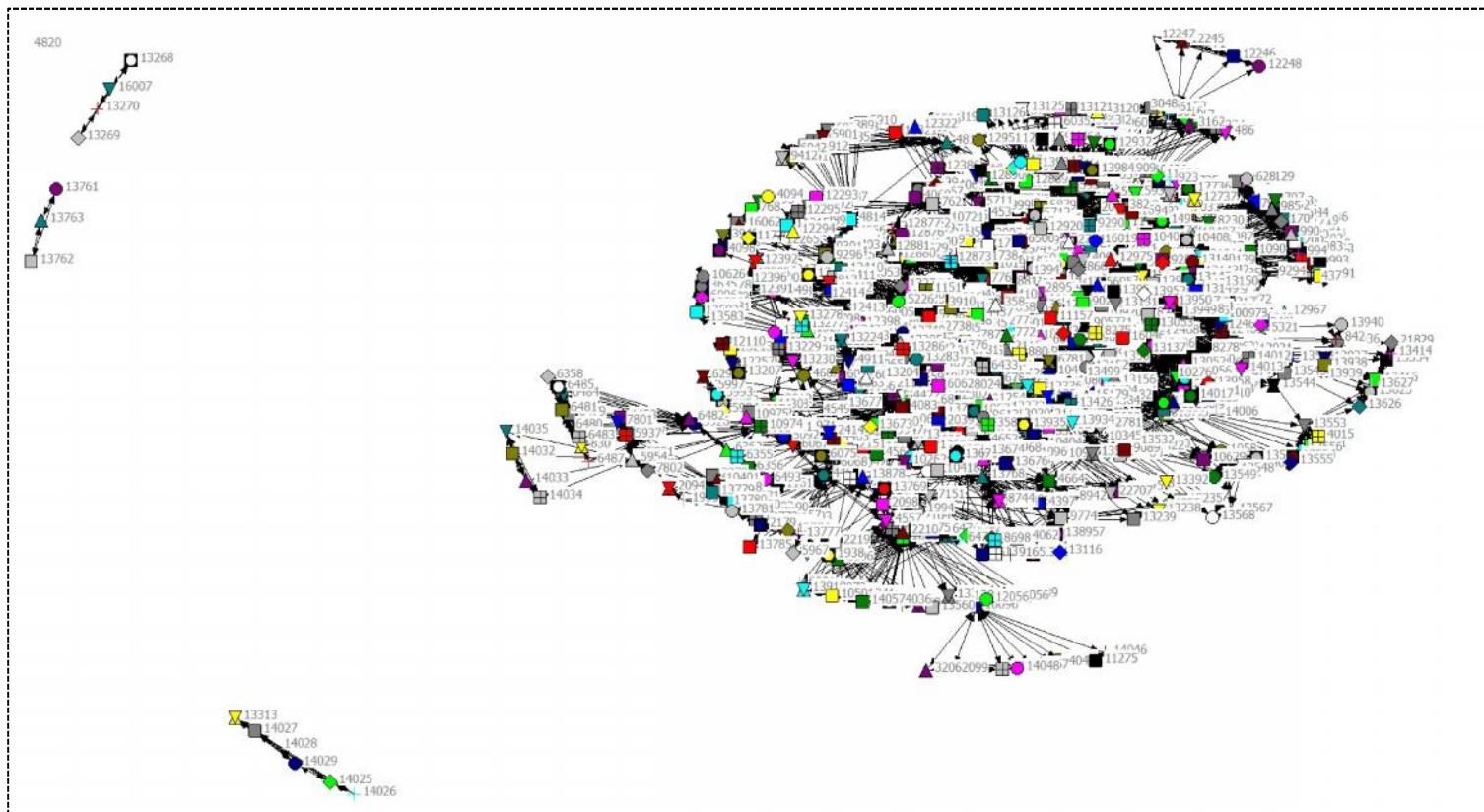


Figure 6.64. Netdraw: witnesses to Melrose abbey beneficiary documents, more than 3

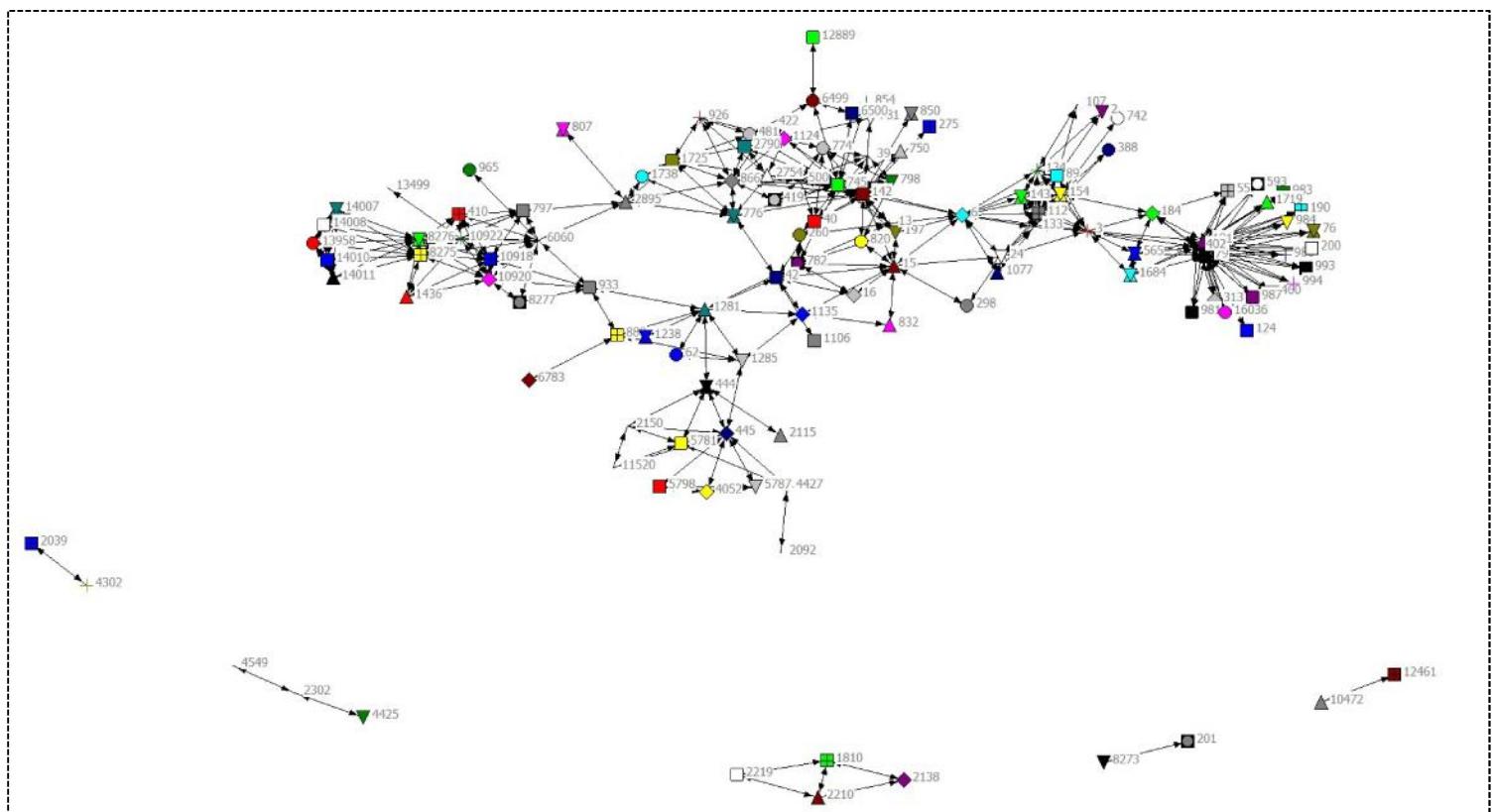


Figure 6.65. Netdraw: witnesses to Melrose abbey beneficiary documents, more than 5

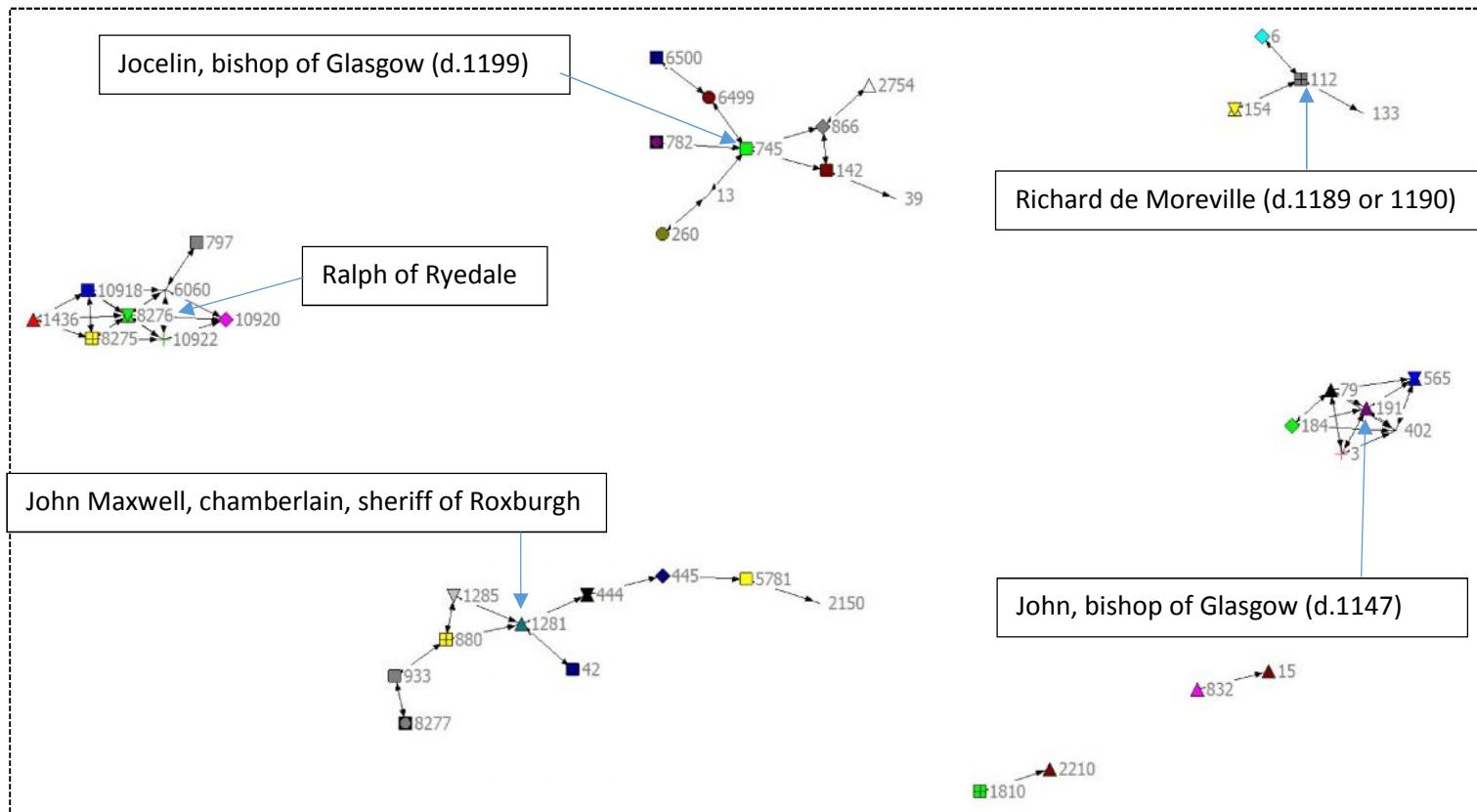


Figure 6.66. Netdraw: witnesses to Melrose abbey beneficiary documents, more than 8

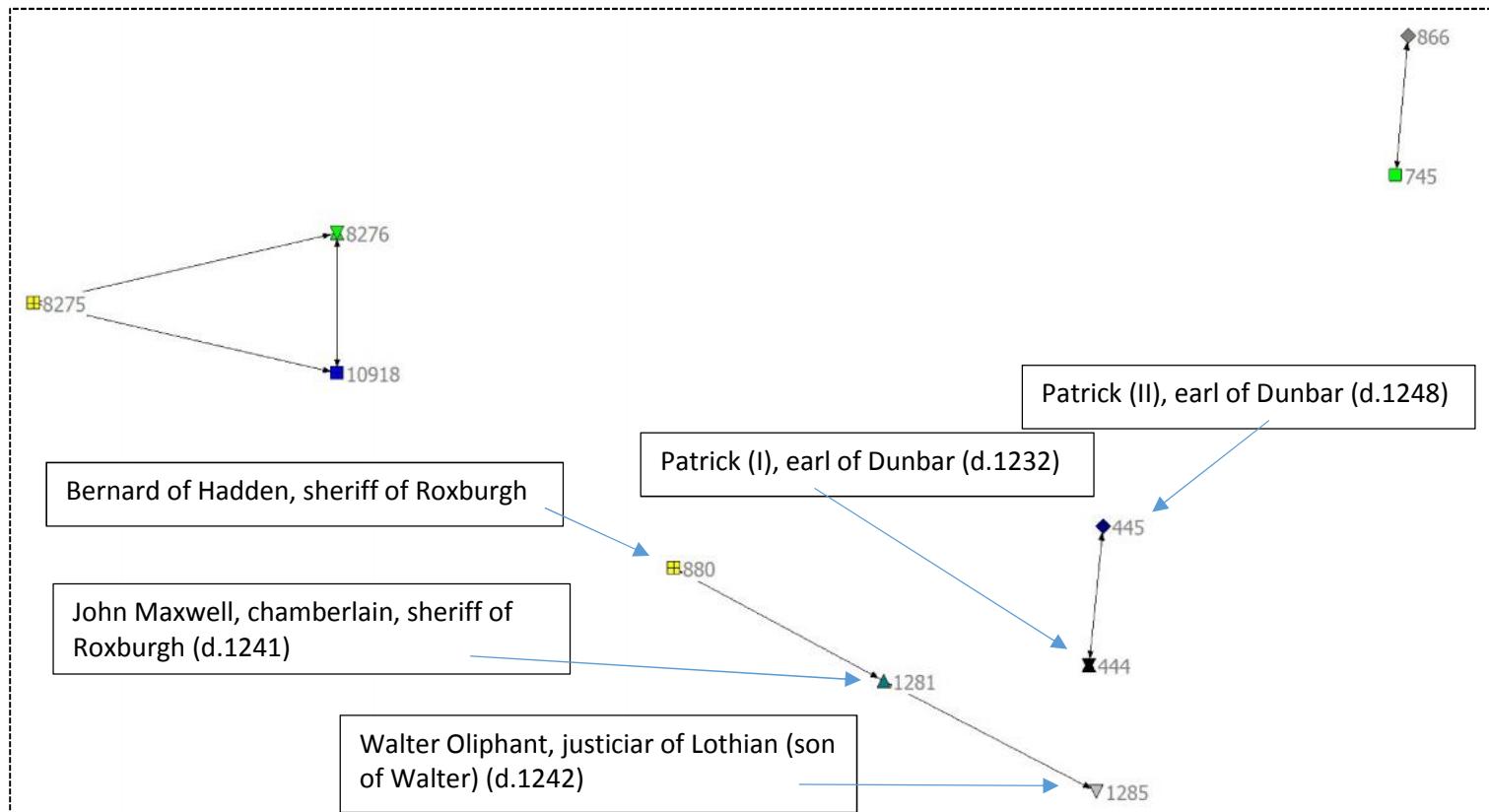
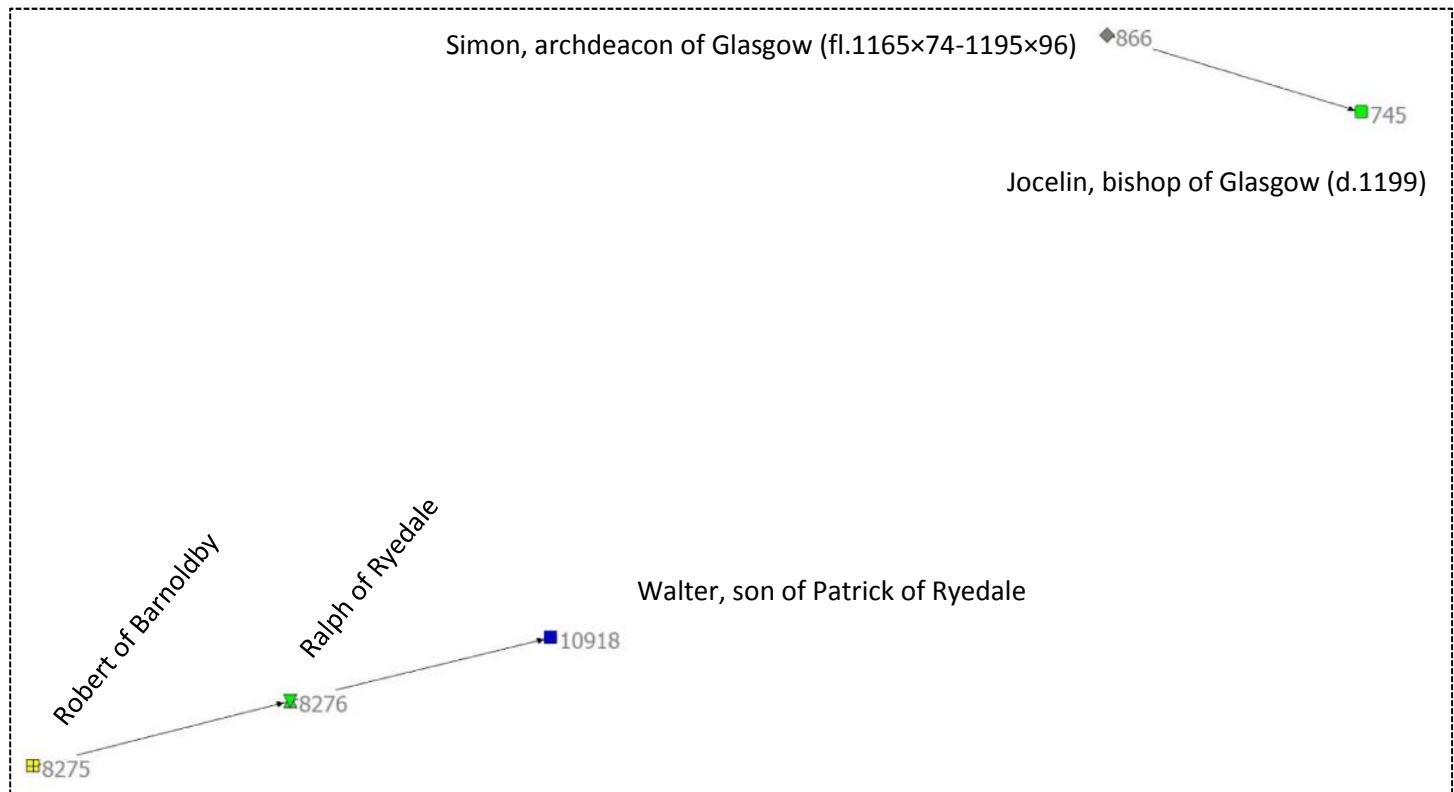


Figure 6.67. Netdraw: witnesses to Melrose abbey beneficiary documents, more than 10



2. Arbroath abbey

There are 229 documents in the study, all of which were charters. 77 (33.6%) of these are royal (H1) charters, 68 (30%) were ecclesiastical, mostly episcopal, charters (H2), and 84 (36.7%) of these are lay (H3) charters. The distribution of charters, then, are roughly equally distributed between royal, ecclesiastical, and lay charters, in stark contradistinction to the Melrose abbey case study. There 725 witnesses in these documents, one of whom was a woman. There were 6487 edges in the study.

William del Bois had the highest (by far) degree and betweenness centrality in the study, and also had the highest eigenvector. Most of the individuals with a degree over 100 were part of the royal inner circle in the part of William I's reign after 1178, when he founded the abbey. These include the chamberlain Philip de Valognes, the earl of Fife and royal justice Duncan (II), earl of Fife, William Hay, lord of Errol, and William Comyn, earl of Buchan: all of these names are familiar from our studies of royal charters. Hugh de Sigillo and Richard de Prebenda appear because of their periods as royal clerks.

The Arbroath abbey social network has been particularly influenced by the extremely enthusiastic charter production and preservation approach adopted by the abbey. For example, the abbey insisted on producing individual charters for each church and piece of land given, even when multiple gifts were

made by the same donor on the same occasion. For example, William Malveisin, bishop of St Andrews, issued twelve charters for Arbroath (H2/10/159-170), for which the following 14 individuals witnessed all of them, except for that Master Stephen of Lilliesleaf did not witness H2/10/160.

- [42] William del Bois, chancellor
- [1215] Simon, prior of St Andrews
- [2491] Stephen of Lilliesleaf, master, clerk, persona
- [2971] Peter, chaplain and clerk of Bishop Malveisin
- [3511] Michael, master, clerk, chaplain
- [3838] Adam Ovid, master
- [3840] Peter of Dryburgh, master, clerk
- [3871] Edward Murray, master, canon, bishop's clerk
- [36] Richard of Dover (Tyningham), master, clerk
- [48] Simon de Noisy, clerk of Bishop William of St Andrews
- [49] William of Gullane, rector of Gullane
- [759] Denis, dean of Angus and Forfar
- [835] Laurence of Thornton, archdeacon of St Andrews

Similarly, a number of individuals appear multiple times as witnesses to six charters of Ralph, bishop of Brechin (H2/3/6-11). The following individuals witnessed all six of these charters:

- [2590] Andrew of Brechin, chaplain
- [2614] Peter, chaplain of bishops of Brechin
- [2615] Mael Brigte MacLeod, prior of céli De of Brechin
- [2617] Robert, son of Edgar
- [2618] Thomas, son of Robert son of Edgar
- [42] William del Bois, chancellor
- [474] Guy, abbot of Lindores
- [59] Gregory, bishop of Brechin

These two further individuals witnessed five of the six charters:

- [39] Hugh de Sigillo, bishop of Dunkeld
- [2616] Alexander Mowat, clerk, chaplain

Therefore, the importance of many individuals in this dataset has been amplified by the fact that in several cases, there are multiple documents recording a single event in time. It would be possible to create a bespoke case study which corrected for this trend by eliminating duplicate documents with identical witness lists, and this may be a methodology worth considering in the future.

Table 6.25. **Centrality: top 20 by degree**

PoMS ID	Person Name	Degree	Eigenvector Centrality	Betweenness Centrality
42	William del Bois, chancellor (d.1232)	206	1	51173.16
15	Philip de Valognes, chamberlain (d.1215)	114	0.875388	12310.79
24	William Hay (I), lord of Errol (d.c.1201)	114	0.971642	5205.113
13	Duncan (II), earl of Fife (d.1204)	107	0.879228	4106.727
39	Hugh de Sigillo, bishop of Dunkeld (d.1229 or 1230)	104	0.865837	5039.28
16	William Comyn, earl of Buchan (d.1233)	102	0.861498	5989.875
858	Walter of St Albans, bishop of Glasgow (d.1232)	101	0.791982	5982.088
798	Richard de Prebenda, bishop of Dunkeld (d.1210)	100	0.863934	2682.751
820	Hugh of Roxburgh, bishop-elect of Glasgow (d.1199)	94	0.838361	2024.025
1233	Philip Melville, justiciar of Scotia	92	0.395064	16987.13
474	Guy, abbot of Lindores (d.1219)	91	0.768695	5038.966
260	Gilbert or Gilla Brigte, earl of Strathearn (d.1223)	90	0.802141	2184.466
59	Gregory, bishop of Brechin (fl.1189x98-1242x46)	89	0.438845	22558.97
782	Malcolm (I), earl of Fife (d.1229)	89	0.824851	3877.067
2	Matthew, bishop of Aberdeen (d.1199)	85	0.699893	4058.758
1106	Philip de Mowbray	83	0.635609	2304.971
419	Archibald, abbot of Dunfermline (d.1198)	82	0.706063	1387.851
66	David Hay, lord of Errol (d.1237½41)	79	0.740174	2810.178
4757	Adam, steward of Arbroath (son of Aldan)	78	0.347125	11881.29
307	Robert of London (d.1225)	74	0.640903	3692.103

The top co-witnessing relationships in the Arbroath abbey beneficiary study are all churchmen. The top five involve the longtime royal clerk and chancellor William del Bois [42]. William witnessed a number of ecclesiastical and lay charters in favour of Arbroath, in addition to royal charters. Most of the other churchmen to co-witness more than 13 times were personnel of the diocese of St Andrews, although the church of Brechin was also well represented, in the persons of Mael Brigte MacLeod, prior of the céli De of Brechin, and Gregory, the long-serving bishop of Brechin.

Table 6.26. Most productive co-witnessing 'relationships' (Arbroath abbey)

Person 1	Person 2	#docs
William del Bois, chancellor (d.1232)	Mael Brigte MacLeod, prior of celi De of Brechin	17
William del Bois, chancellor (d.1232)	Simon of St Andrews, master (fl.1199/1200-1212x18)	17
William del Bois, chancellor (d.1232)	Hugh de Sigillo, bishop of Dunkeld (d.1229 or 1230)	15
William del Bois, chancellor (d.1232)	Simon de Noisy, clerk of Bishop William of St Andrews	14
William del Bois, chancellor (d.1232)	William of Gullane, rector of Gullane	14
Simon de Noisy, clerk of Bishop William of St Andrews	William of Gullane, rector of Gullane	14
Gregory, bishop of Brechin (fl.1189x98-1242x46)	Alexander Mowat, clerk, chaplain (fl.1210s)	14
Laurence of Thornton, archdeacon of St Andrews (d.1238x40)	Peter, chaplain and clerk of Bishop Malveisin	14
Laurence of Thornton, archdeacon of St Andrews (d.1238x40)	Edward Murray, master, canon, bishop's clerk	14

Figure 6.68. Netdraw: witnessed to Arbroath abbey beneficiary documents

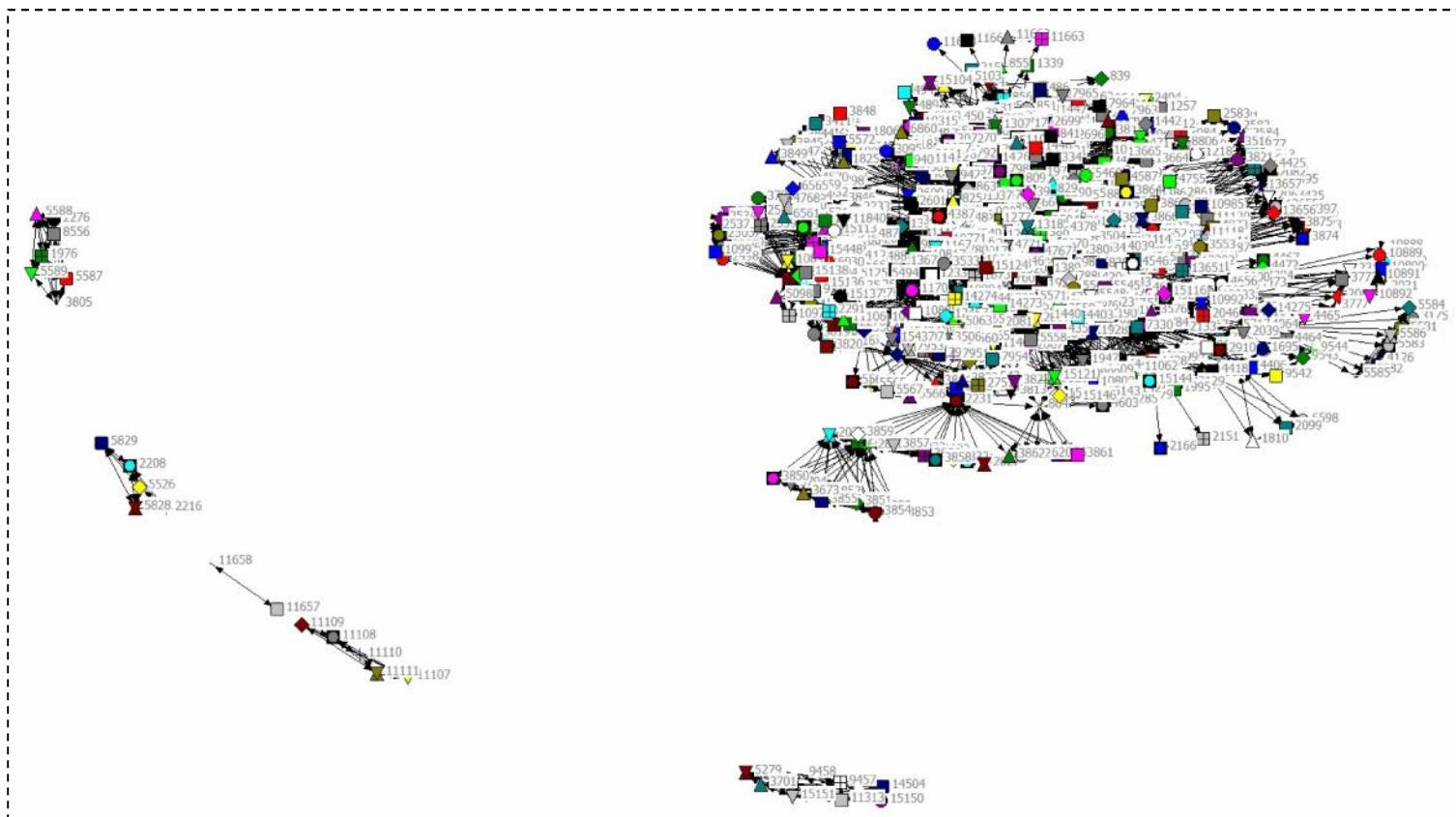


Figure 6.69. Netdraw: witnessed to Arbroath abbey beneficiary documents, more than 3

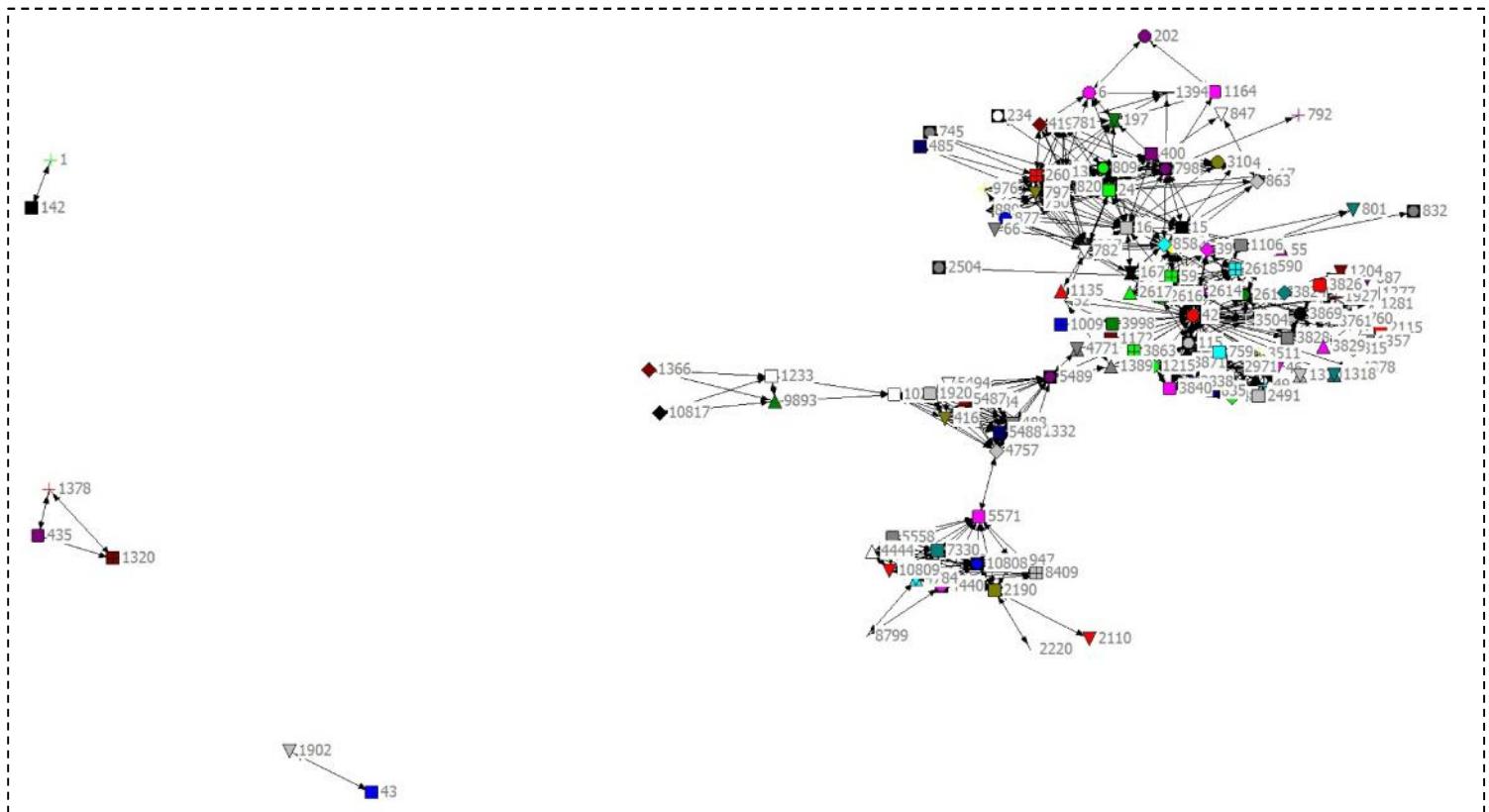


Figure 6.70. Netdraw: witnessed to Arbroath abbey beneficiary documents, more than 5

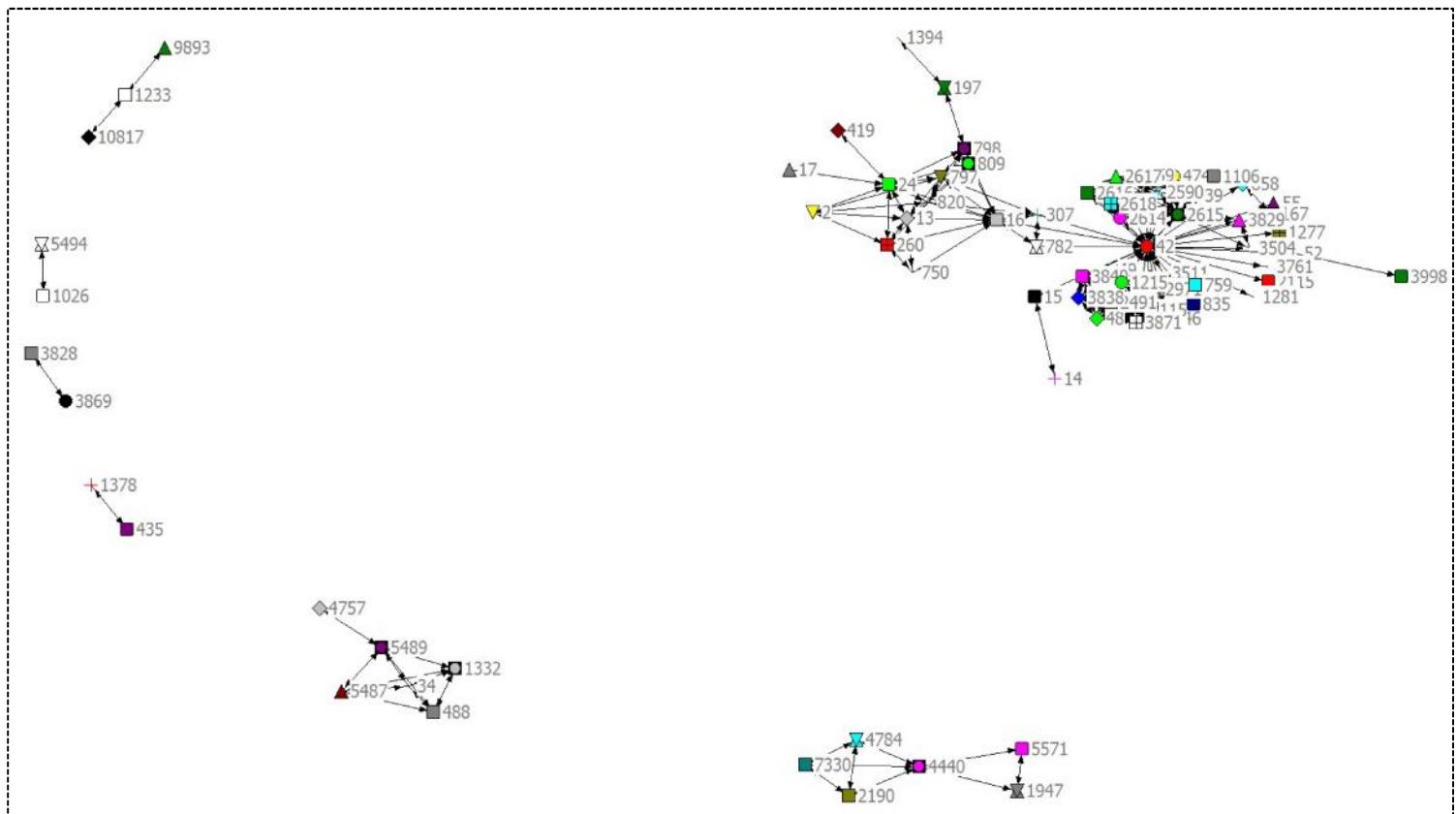


Figure 6.71. Netdraw: witnessed to Arbroath abbey beneficiary documents, more than 7

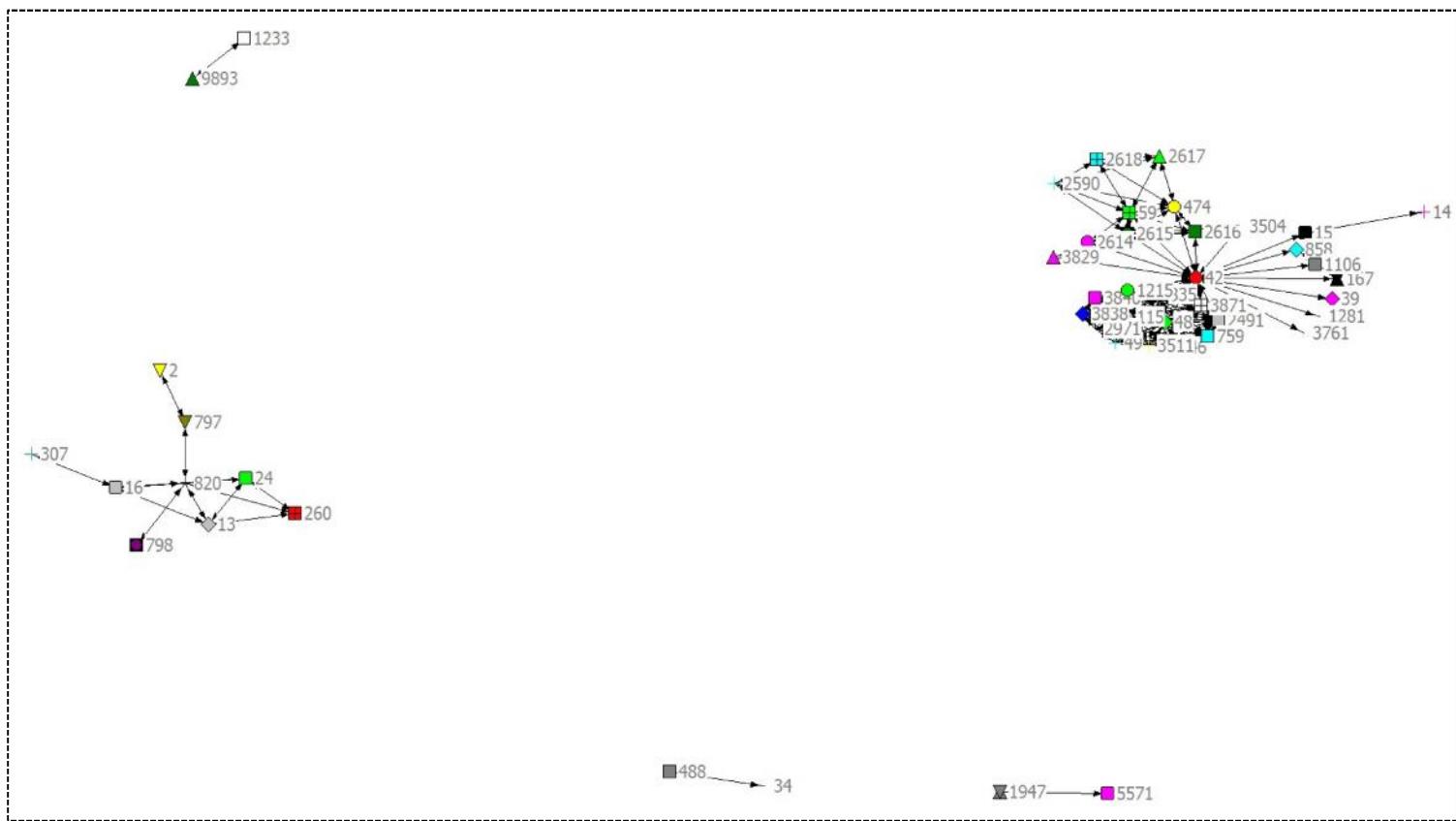


Figure 6.72. Netdraw: witnessed to Arbroath abbey beneficiary documents, more than 10

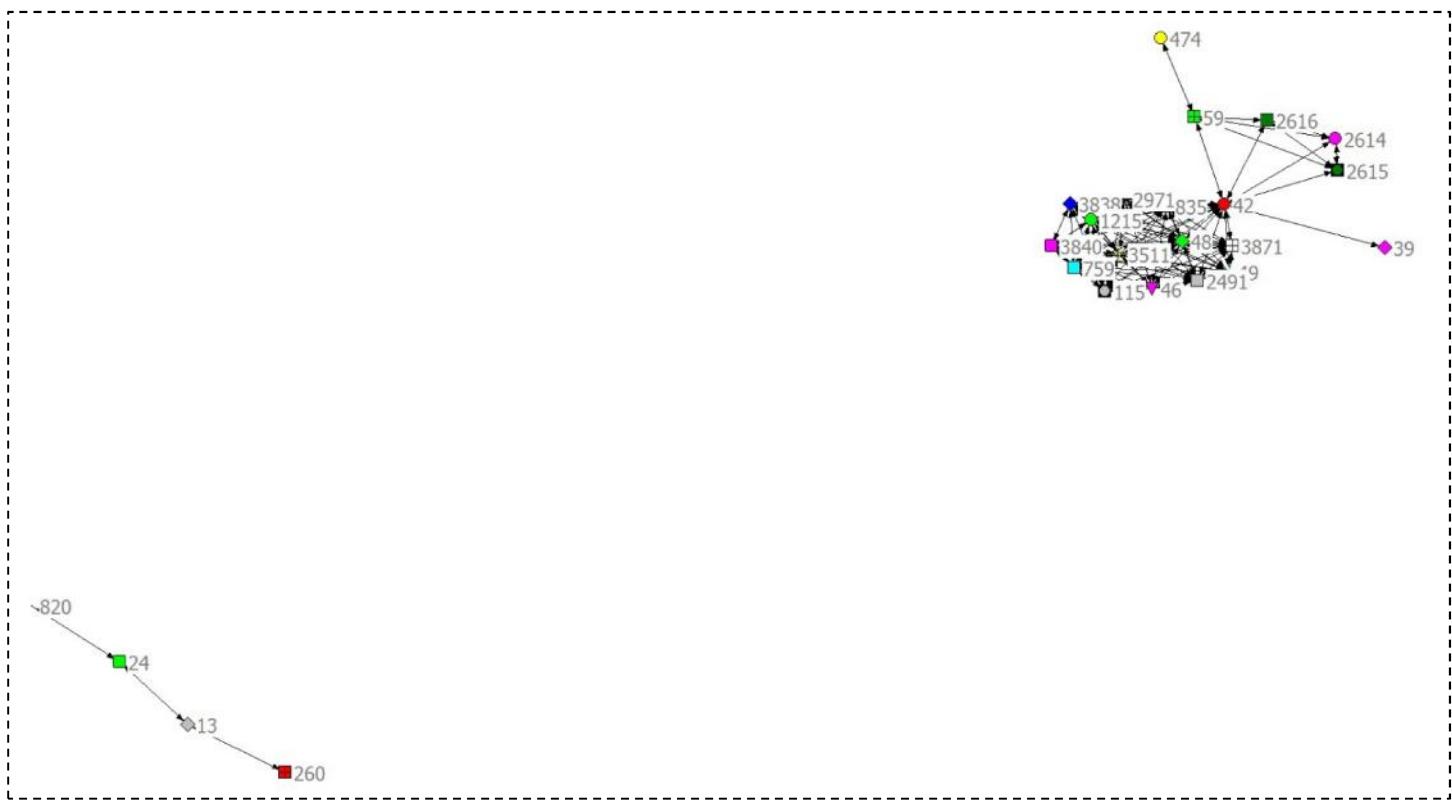


Figure 6.73. Netdraw: witnessed to Arbroath abbey beneficiary documents, more than 12

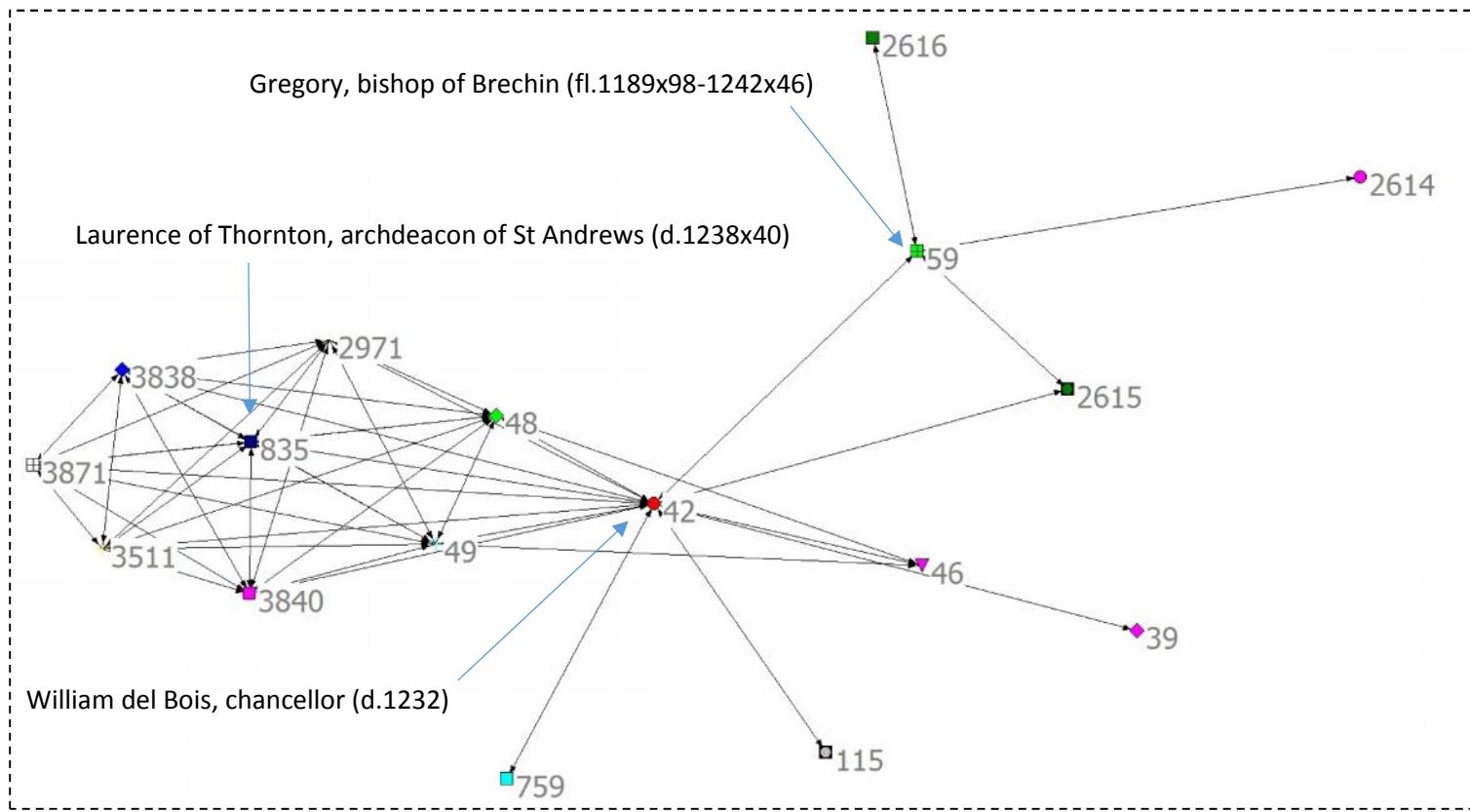


Figure 6.74. Netdraw: witnessed to Arbroath abbey beneficiary documents, more than 14

