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A-324 TRONDHEIM
REANALYSIS OF PREVIOUSLY DATED LOGS FROM SØNDRE GT. 7-11 IN TRONDHEIM

Sammendrag

Tidligere daterte stokker fra Søndre gt. 7-11 er presentert i to dendrorapporter:

Dendro/12-2017 av 21.06.2017 titulert «*Dendrokronologisk analyse av prøvene fra Klemenskirken, Trondheim*», hvor prøvene med ID 26700, 29209, 23670, 22003 og 15705 ble datert til perioden 1219-1221

Dendro/06-2018 av 24.04.2018, titulert «*Dendrokronologi-prøver fra Klemenskirken*». Ytterste tilgjengelige årring i stokkene med ID 43272, 36565, 43706 og 43867 ble datert til perioden 1217-1221, ytterste tilgjengelige årring i stokkene med ID 34453, 12666, 33922/33917 og 52697 ble datert til perioden 1006-1009, ytterste tilgjengelige årring i stokk med ID 46243 ble datert til perioden 981-982 og ytterste tilgjengelige årring i stokk med ID 46501/43240 ble datert til 1047.

Av 41 mottatte stokker ble 15 datert med dendrokronologi i 2017 og 2018. Dette notatet gir en reanalyse av disse resultatene etter at en aldersmodell basert på dendrokronologi og radiokarbondatering foreligger for lokaliteten. Det er sterkt anbefalt å benytte radiokarbondatering i kombinasjon med dendrokronologi samt et stort antall dateringsprøver for komplekse arkeologiske utgravninger. Dette både på grunn av muligheten for gjenbruk av tømmer og forflytning av materiale, på grunn av nedbrytningen av materiale i dendroprøver og radiokarbonprøver og fordi den dendrokronologiske anbefalingen om 10 prøver av samtidige trær per objekt sjelden oppfylles i arkeologiske kontekster. Denne reanalysen bruker også de siste oppdateringene av de dendrokronologiske grunnkurvene, som ble revidert i 2022 ved at nettverket av grunnkurver ble inndelt fylkesvis og ved at mange nye prøver ble lagt til. Dette forbedrer muligheten for dendrokronologiske dateringer da det forsterker det signalet som er felles for mange trær i hver region.

Av 15 dendrodaterte stokker, er det 2 som ikke samsvarer med radiokarbondateringene; stokk med hhv. ID 46501/43240 og 33922/33917. Dendrokronologisk reanalyse av disse gav ikke resultat og stokkene må anses som udatert med dendrokronologi. Resultatet for de 9 øvrige stokkene fra kirke C med ID 26700, 29209, 23670, 22003, 15705, 43272, 36565, 43706 og 43867 samsvarer med dendrodateringene som ble utført i 2017 og 2018. Resultatet for stokk 11 fra kirke A med ID 34453 samsvarer også med dendrodateringen som ble utført i 2018. Stokk med ID 52697 er prøvetatt med fotografier og er derfor utelatt fra dendrokronologisk reanalyse da fysisk tilgang til materialet er nødvendig for å gjøre en god evaluering. De to resterende stokkene, med ID 12666 og 46243 kunne ikke dendrodateres med de metoder og verktøy som er benyttet i denne reanalysen, men analyseresultatet fra 2018 samsvarer med radiokarbondateringene.

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Report

During 2017 & 2018, 41 dendrochronological samples of timber from an archaeological excavation in Søndre gate 7-11 were received at the National Laboratory for Age Determination. The material was analysed in 2017 and 2018 and the results were presented in two reports.

Dendro 12-2017 of 21.06.2017, titled «*Dendrokronologisk analyse av prøvene fra Klemenskirken, Trondheim*» presents the results of 13 samples, where five were dated. The samples with label ID 26700, 29209, 23670 and 15705 were assigned the felling year 1220-1221 and the sample with label ID 22003 was assigned the felling year 1219-1220.

Dendro 06-2018 of 24.04.2018, titled «*Dendrokronologi-prøver fra Klemenskirken*» presents the results of all 41 samples, where 10 additional samples were dated. The sample with label ID 34453 was dated to after 1009, the sample with label ID 12666 was assigned the felling date winter 1006-1007, the sample with label ID 33922/33917 was assigned the felling date winter 1008-1009, the sample with label ID 46243 was assigned the felling date winter 981-982, the sample with label ID 43272 was assigned the felling date winter 1217-1218, the samples with label IDs 36565, 43706 and 43867 were assigned the felling date winter 1220-1221, the sample with label ID 46501/43240 was assigned the felling date summer 1047, and the sample with label ID 52697 was dated to after 1008.

Control dating by radiocarbon measurements was carried out in 2022 on six of the previously dendro-dated samples, resulting in 2 samples, numbered ID 46501/43240, and 33922/33917, for which the radiocarbon measurement and the dendrochronological cross-matching do not agree. Dendrochronological re-analysis with the updated master chronology did not give results and they are now considered undated by dendrochronology. Log ID 52697 was not dated with the updated master chronology as it was not possible to have access to the material. The original sampling was done on photographs.

The results of 9 of the 10 logs of Church C (ID 26700, 29209, 23670, 22003, 15705, 43272, 36565, 43706, 43867) and of the corner post of Church A (ID 34453) are in accordance with the results of 2017-2018.

Methods

This report presents a reanalysis of the previously dated logs, using dendrochronology and radiocarbon dating. Employing both methods is strongly preferred when dating archaeological material. This is because the dendrochronological recommendation of ten contemporaneous samples of the same species is rarely achieved and because wood from archaeological contexts is often decayed from being buried in soil, causing distortion of the relative tree-ring widths.

The dendrochronological reanalysis is made with the software TSAPwin Scientific 4.81j (Rinn 2011), which offers easier data handling and additional cross-dating parameters compared to the software used for Dendro 12-2017 and Dendro 06-2018.

The regional chronologies for Sør-Trøndelag, Nord-Trøndelag, Oppland, Sogn og Fjordane and Hordaland were compiled and/or revised in 2022, when the datasets were split according to county and many additional samples were added to each of the regions. This will ensure improved cross-matching performance as it enhances the signal that is common for many trees in each region.

Evaluation of cross-matching output is made by giving most weight to the visual relation between ring patterns, the t-value of Baillie and Pilcher (1973) and to the Gleichläufigkeit value (Eckstein and Bauch 1969), as well as the number of years overlap between sample and reference chronology.

The catras (CAT) number is the dendrochronological archiving number of each measurement. CAT numbers lower than 14004068 were measured and evaluated with regard to bark or waney edge when the material was freshly excavated in 2017. CAT numbers higher than this are repeat measurements made in 2022. Only 3 remeasurements were made as the material has now dried and is more difficult to examine. The samples have been given a chronological number that follows the order in which they were measured in 2017/2018, cf. Dendro 12-2017 and Dendro 06-2018. The Sample ID is the number that was on the sample label when arriving at the laboratory, the number that was marked with a circle on the labels are here given in parenthesis.

All the measurements were made on wooden disk samples except the sample with chronological number 37 and label ID 52697. This sample has five measurements and all of them are made on photographs. Dendrochronological cross-matching of photographed samples is generally more challenging than cross-matching measurements made on physical samples. This is because of the distortion of ring width that is caused by making measurements along the radial section of the stem, which is necessary on carved planks as opposed to the transversal section, combined with the difficulties of taking pictures in exactly 90 degrees angle to every ring. Photodendro is most successful when a mean chronology of cored samples from the same building is already established.

Results

The results are presented in Table 1 and 2. The following attributes are listed for each sample:

Tot = total number of rings in the sample

Sp Gives the number of years in the sapwood.

Sp = ? = The transition between sapwood and heartwood has not been visible on the sample. This transition can sometimes be invisible even if sapwood is present, especially for degraded and/or withered material.

B = Bark is present

W = Waney edge is present, i.e., the outermost ring on the tree is present on the sample.

-Y = The outermost tree ring and an unknown number of rings is missing from the sample.

w. = felled in the winter of the given years

a. = (a=after) felled an unknown number of years after the given year.

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Table 1. Results after dendrochronological reanalysis of previously dated logs from Søndre gt. 7-11. All the samples are of Scots pine. «after-dates» (a.=after) occur when the outermost tree rings are missing on the sample. "winter-felling" (w.=winter) means the sample was felled in the winter of the given years.

Chrono-logical number	**CAT-number**	**label ID**	**Tot**	**Sp**	**Bark**	**Date**
2A	14004013	«TA 2017/3 (26700) IPD26710»	119	73	B	w. 1220-1221
2B	14004014		114	73	B	w. 1220-1221
3	14004015	«TA2017/03 (22003) Base og post»	114	61	B	w. 1219-1220
4A	14004016	«TA 2017/03 DendroID: 29218 Post	144	63	W	w. 1220-1221
4B	14004019	(29209) KOØ 9/6-17»	147	?	W	w. 1220-1221
6	14004018	«TA2017/03 ID: 23753 (23670) 19/5»	105	?	W	w. 1220-1221
9	14004023	«TA2017/03 19.4.17 15705 SK»	141	60	B	w. 1220-1221
11A	14004027	«TA2017/03 (34453)»	179	?	-Y	a. 1009
11B	14004028		145	?	-Y	a. 1009
11C	14004029		129	0	-Y	a. 958
11D	14004926		178	?	-Y	a. 1009
13A	14004031	«TA2017/03 Dendro 12673 (12666)»	79	?	W	Udatert
13B	14004032		77	?	W	Udatert
15A	14004034	«33922 339₇17»	75	?	W	Udatert
15B	14004035		75	?	W	Udatert
15C	14004924		61	?	-Y	Udatert
17A	14004037	«TA2017/3 46243»	306	56	W	Udatert
17B	14004038		301	50	-Y	Udatert
18A	14004039	«43272 3D photogr.»	95	?	-Y	a. 1212
18B	14004040		99	?	W	1217-1218
19A	14004041	«TA2017/03 6/7 36565»	107	?	-Y	a. 1217
19B	14004042		109	?	W	1220-1221
20A	14004043	«TA2017/03 4/8-17 43706»	117	?	W	Undated
20B	14004048		117	?	W	1220-1221
21	14004044	«43867 church C 1/8-17 RW»	129	?	W	1220-1221
22C	14004047	Post 46501 from postholes 43240	122	?	W	Undated
22D	14004925	21/8-17	60	?	W	Undated
37A	14004064	«52697»	88	?	-Y	Undated
37B	14004065		100	?	-Y	Undated
37C	14004066		68	?	-Y	Undated
37D	14004067		64	?	-Y	Undated
37E	14004068		81	?	-Y	Undated

Table 2. t-values for the mean curves of the dated samples from Church C and log 11 and five pine chronologies. The t-value is one of several measures of the similarity between two tree-ring series. Values higher than 3.5 are generally considered significant, but a dendrochronological match also requires visual agreement and that the signal can be replicated in more than one sample and with more than one independent master chronology.

Mean curve / t-value	Sogn og Fjordane (765-2007)	Sør-Trøndelag (653-2017)	Nord-Trøndelag (865-1875)	Trondheim (552-1281)	Oppland (837-1986)	Kystfylker (653-2021)
Church C	-	8.4	5.5	7.9	4.5	4.9
log 11	5.0	5.5	-	5.8	5.3	5.8

Some of the samples from Søndre gt. 7-11 were incorporated in the Sør-Trøndelag chronology, but these have been excluded from the chronology for this analysis. The chronology Kystfylker was constructed in 2022 and contains samples from the counties Rogaland, Hordaland, Sogn og Fjordane, Møre og Romsdal, Sør-Trøndelag and Nord-Trøndelag. The chronology Trondheim was constructed by Terje Thun and contains samples from the excavations at Folkebibliotekstomta in Trondheim.

Comments on the samples

Dendrochronological samples that have undergone decay from being buried in soil are more prone to measurement errors and -inaccuracies than well-preserved samples. Sample 21 of the log with label ID 43867 has an abruptly narrow ring in year 9 of the measurement that looks like a likely measurement error. The 10 first years of sample 21 were excluded from the analysis. Sample 19A of log with label ID 36565 has a shift of one year in relation to sample 19B that is likely due to measurement error. The first 43 years of sample 19A were excluded from the analysis. Sample 20A of the log with label ID 43706 has periods of deviating tree-ring pattern in relation to sample 20B that is likely caused by inaccurate measurement. Sample 20A was excluded from the analysis in favour of sample 20B.

Church C

According to NIKU rapport 97, the logs with label ID 26710, 22003, 29209, 23670, 15705, 43272, 36565, 43706, 43867, 46501 belong to the same building, called “Church C”. A mean curve from the dated measurements from this building could be made to ensure the reliability of cross-matching and help avoid spurious correlations with the master chronologies. For the log with chronological number 22 and label ID 46501, which belongs to “Church C”, a statistically and visually acceptable match could not be found with the mean curve for the building or with the master chronologies. It is not unusual that some trees have a deviating growth pattern compared to other trees in the same forest. This can be due to e.g. local site differences, damage, shading, or lack of nutrient access.

Dendrochronological analysis indicates that the logs with chronological number 2 (label ID 26700), 4 (29209), 6 (23670), 9 (15705), 20 (43706), and 21 (43867) are felled in the winter of 1220-1221, the log with chronological number 3 (label ID 22003) is felled in the winter of 1219-1220, the log with chronological number 18 (label ID 43272) is felled in the winter of 1217-1218.

The log with label ID 46501, which is undated by dendrochronology, was radiocarbon dated to 1179-1222 AD at 95.4% confidence level.

Sapwood is clearly visible in the dated samples with chronological number 2A, 2B, 3, 4A, and 9. The proportion of sapwood in these samples along with presence of bark in samples 2A, 2B, 3, and 9 makes it likely that the timber for Church C was felled in the period 1217 to 1221 and that the building was finished in 1221 or shortly after. It is not unusual that timber for buildings is felled over a few years.

The mean curve of the dated samples from "Church C" covers the period 1074-1220 and can be dated by three independent pine chronologies, Sør-Trøndelag, Nord-Trøndelag and Oppland. The mean curve of the samples from Church C can be dated with visual agreement and high t-values.

t-values for the dated positions are shown in Table 2. Cross-dating statistics for individual samples and internal cross dating statistics for the samples from "Church C" are shown in Appendix 1.

Church A

The log with chronological number 11 (label ID 34453) is felled after 1009. This dendrochronological date is based on only one tree, which means that a date for this log cannot be verified by replication. However, the dating is supported by acceptable cross-matching statistics and visual agreement with three independent master chronologies and is in agreement with the radiocarbon date of the same log. The transition between heartwood and sapwood is not visible on the sample, which prevents an estimation of the number of missing rings.

The mean curve of the samples from log 11 with label ID 34453 can be dated by three independent pine chronologies, Sør-Trøndelag, Sogn og Fjordane and Oppland. t-values for the dated positions are shown in Table 2. The mean curve of the samples from log 11 can be dated with visual agreement and acceptable t-values, but is based on one single tree.

According to the NIKU rapport 97, the logs with label ID 33922/33917 and label ID 34453 belong to the same building. A statistically and visually acceptable match could not be found between the two logs and no statistically and visually acceptable match with the master chronologies was obtained for the log with label ID 33922/33917.

Ring number 153 of the sample with label ID 34453 was radiocarbon dated to 964-987 AD at a 95% confidence level and the sample with label ID 33922/33917 was radiocarbon dated to 1092-1108 AD at a 95% confidence level.

Cross-dating statistics for individual measurements and internal cross dating statistics are shown in Appendix 2. t-values for the dated position are shown in Table 2.

Provenance

All dated samples have the highest cross-dating statistics with the chronologies Trondheim and Sør-Trøndelag, indicating local timber sources. Results for the dated samples are presented in Figure 1.

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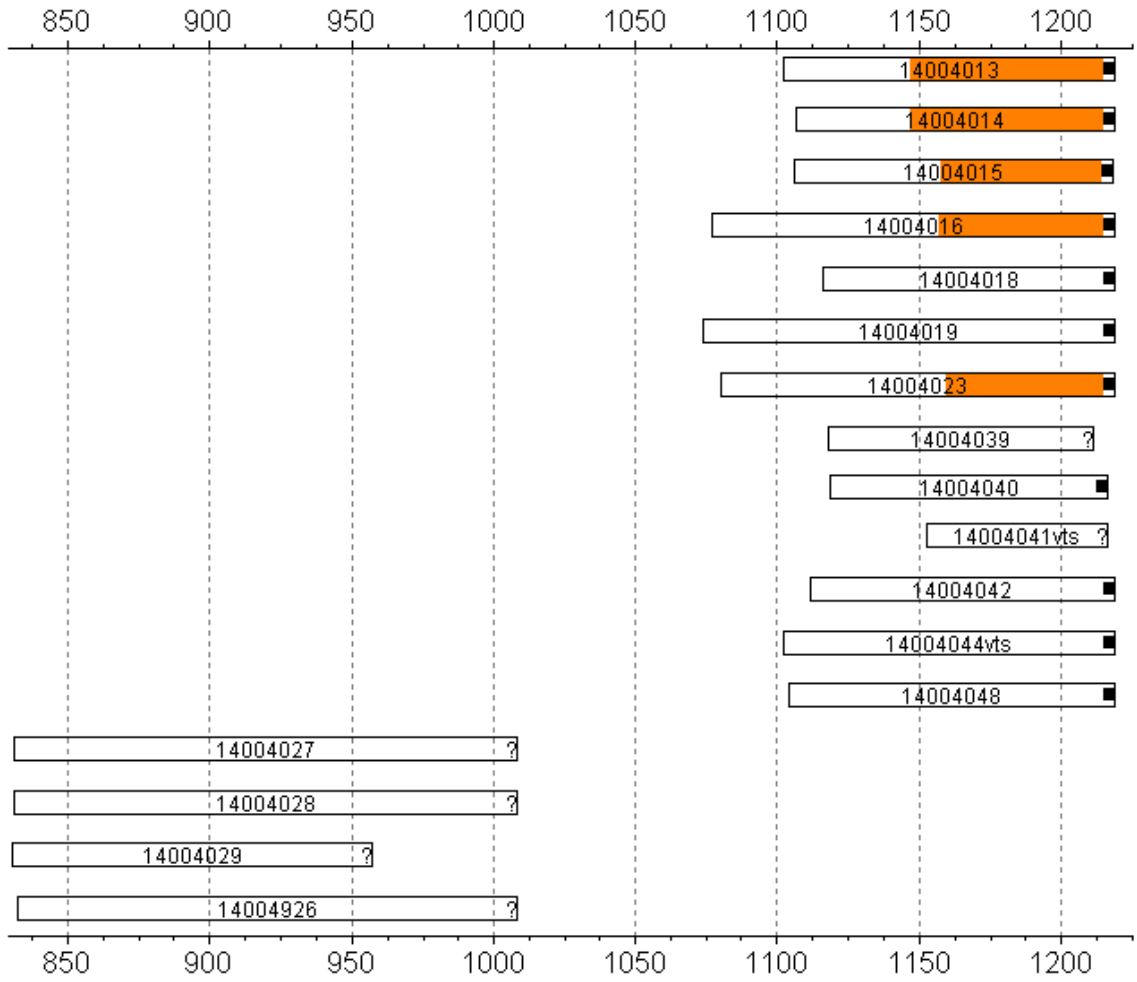

Figure 1: Diagram with dated samples shown as rectangles on a time scale with the 8-digit dendrochronological archiving number. Sapwood is indicated in orange colour where it was visible on the sample. Missing outermost tree rings are indicated by a question mark.

Undated samples

For the log with chronological number 13 and label ID 12666, a statistically and visually acceptable match with the master chronologies could not be found. The samples 13A and 13B have a shift of one year in relation to each other at ring 51 of sample 13A, likely due to measurement error in one of the samples and the two series can not be averaged. The material has now dried and can no longer be processed for new measurements. The sample with label ID 12666 was radiocarbon dated by wiggle-matching of two samples to 976-1025 AD at a 95% confidence level. This is in accordance with the dendro date of 1006-1007 of the report Dendro 06-2018.

The samples 17A and 17B of the log with label ID 46243 have a shift of one year in relation to each other in first 101 and in the last 26 years of the measurements. When the shifted years of these measurements are excluded and the two samples are averaged, cross-dating statistics indicate a possible match with the master chronologies from Trondheim and Sør-Trøndelag with the outermost tree ring of the sample in the year 981. This date cannot be replicated by other independent tree-ring master curves, but is in agreement with a radiocarbon wiggle-match of the same log. The sample with label ID 46243 is radiocarbon dated to 975-1043 AD at a 95% confidence level.

The samples from the plank with chronological number 37 and label ID 52697 are measured on photographs. Due to the added uncertainty of photograph measurements, a proper reanalysis of this sample is not possible without physical access to the plank. It is therefore listed as undated in this report. Cross-matching statistics of the measurements from 2018 indicate a possible match for sample 37B in 977 and for sample 37C in 1004. Averaging these samples gives a t-value of 3.6 with the chronology from Sør-Trøndelag, but the date cannot be replicated with other independent chronologies. The date, however, agrees with the radiocarbon date of the same tree. The plank was dated twice by radiocarbon dating with the result 992-1025 AD at a 95% confidence level.

From the age model of this site, it is clear that some logs were reused. It is common that building materials have been reused or have been felled over a few years for a single building. For this reason, multiple logs are required to date the construction of a building.

Best regards,

Helene Svarva

Marie-Josée Nadeau

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APPENDIX 1

Table 3: Inter-correlation statistics for the dated samples from Church C. The table shows the overlap (ovl) and t-value between pairs of samples and measurements. The t-value is one of several statistical measures of the correlation between two tree-ring series. Strong matches have higher t-values. A t-value of 3.5 is generally considered significant, but a dendrochronolgical match also requires visual agreement and acceptable values of other statistical parameters.

t-value /ovl	2A	2B	3	4A	4B	6	9	18A	18B	19A	19B	20B	21
2A	-	14.9	3.4	2.2	3.7	5.1	3.0	4.4	4.2	6.0	6.2	2.8	3.0
2B	114	-	3.9	3.7	4.8	5.0	3.1	3.5	3.5	7.0	6.0	2.6	3.4
3	114	114	-	3.7	4.1	4.6	3.1	4.9	5.6	4.2	4.8	2.9	3.7
4A	119	114	114	-	7.1	3.3	4.0	2.4	0.0	3.6	3.1	3.3	5.8
4B	119	114	114	144	-	3.5	4.7	2.4	2.9	4.9	4.1	3.7	5.6
6	105	105	104	105	105	-	3.4	2.5	4.0	4.9	4.5	4.3	3.0
9	119	114	114	141	141	105	-	3.2	1.8	3.8	4.8	3.3	2.5
18A	95	95	95	95	95	95	95	-	4.9	3.0	2.8	2.0	1.3
18B	99	99	99	99	99	99	99	94	-	4.2	3.8	1.5	1.5
19A	65	65	65	65	65	65	65	60	65	-	9.0	1.7	2.2
19B	109	109	108	109	109	105	109	95	99	106	-	3.3	0.5
20B	117	114	114	117	117	105	117	95	99	65	109	-	2.6
21	119	114	114	119	119	105	119	95	99	65	109	117	-

Table 4: Cross-dating statistics for the dated samples from Church C. The table shows the t-value between the measured samples and the reference chronologies and to the mean curve of the building after exclusion of that sample. The t-value is one of several statistical measures of the correlation between two tree-ring series. Strong matches have higher t-values.

t-value	Sogn og Fjordane	Sør-Trøndelag	Nord-Trøndelag	Trondheim	Oppland	Kystfylker	MK
2A	4.0	8.5	3.6	8.4	4.1	5.3	7.5
2B	3.4	8.5	4.9	9.1	3.6	5.0	7.7
3	2.9	8.2	6.0	7.9	2.5	6.2	7.2
4A	3.0	4.6	3.6	4.4	2.7	4.7	3.7
4B	1.7	4.9	3.6	4.7	2.4	3.4	5.7
6	1.9	7.4	4.9	7.1	3.0	4.9	7.1
9	4.2	5.6	4.2	4.8	3.5	4.8	4.9
18A	3.5	6.7	5.0	6.5	3.2	5.3	4.5
18B	2.9	5.9	5.2	5.7	0.9	3.8	4.7
19A	1.7	8.3	5.1	8.4	2.0	6.0	6.6
19B	3.6	7.3	5.0	7.6	2.3	4.3	7.4
20B	2.2	3.4	2.4	4.5	1.7	3.8	4.3
21	2.8	4.6	1.8	3.1	2.5	4.1	4.5

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APPENDIX 2

Table 3: Inter-correlation statistics for the dated measurements on the sample from Church A. The table shows the overlap (ovl) and t-value between pairs of samples and measurements. The t-value is one of several statistical measures of the correlation between two tree-ring series. Strong matches have higher t-values. A t-value of 3.5 is generally considered significant, but a dendrochronolgical match also requires visual agreement and acceptable values of other statistical parameters.

t-value /ovl	11A	11B	11C	11D
11A	-	31.5	6.5	8.8
11B	179	-	6.0	8.6
11C	128	128	-	5.8
11D	178	178	127	-

Table 4: Cross-dating statistics for the dated measurements on the sample from Church A. The table shows the t-value between the measured samples and the reference chronologies and to the mean curve of the building after exclusion of that sample. The t-value is one of several statistical measures of the correlation between two tree-ring series. Strong matches have higher t-values. A t-value of 3.5 is generally considered significant, but a dendrochronolgical match also requires visual agreement and acceptable values of other statistical parameters.

t-value /ovl	Sogn og Fjordane	Sør-Trøndelag	Nord-Trøndelag	Trondheim	Oppland	Kystfylker
11A	5.0	4.7	1.8	4.8	5.2	6.1
11B	4.3	4.6	2.0	4.6	4.7	6.0
11C	4.0	3.6	0.8	3.8	4.8	4.3
11D	3.6	5.3	0.1	5.2	3.7	6.0

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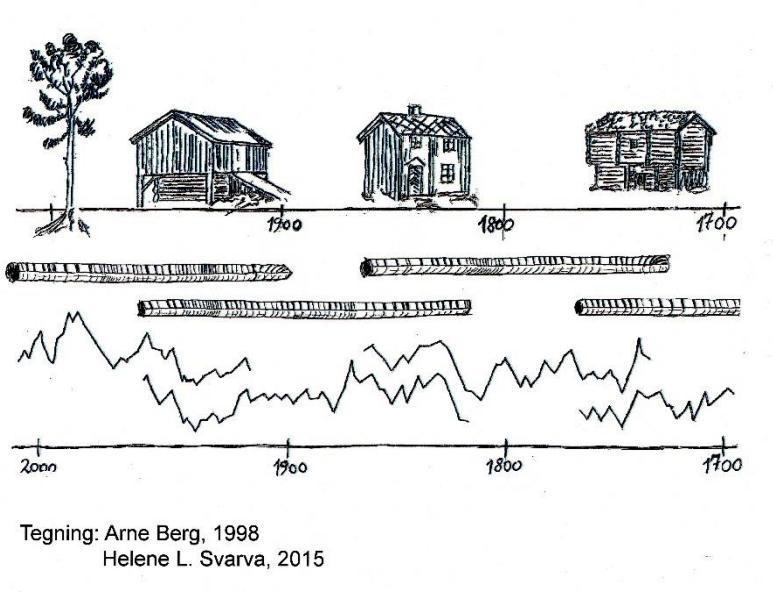
APPENDIX 3

Dendrochronology – presentation of the method

Dendrochronology is a method of dating the felling year of timber by analysing the growth patterns of trees. An annual ring is produced each summer, whereby the age of each annual ring in a living tree can be known by ring counting. In dendrochronology, it is the variation in tree-ring widths that is of interest. In Norway, where sufficient precipitation ensure that most trees have adequate water supply, the summer season temperature determines the growth patterns in most trees. Put simply, a cool summer gives a narrow ring, and a warm summer gives a wider ring. When displayed graphically, the year-to-year pattern of ring width variation and will for many trees be quite similar to the variation in summer temperature in the same years. This means that trees of the same species that grows in the same geographical area develop comparable tree-ring patterns.

Tree-ring width is measured with an accuracy of 1/100 mm. This is done using specially designed equipment that transfers the measurements to a computer. When the sample is measured, it can be compared to established regional chronologies of known age. A chronology is a record of the growth pattern in many trees and is constructed after the principle shown in the drawing below.



The principle for constructing tree-ring chronologies. The drawing is simplified, many samples and longer periods of overlap are required.

After drawing by architect Arne Berg, reworked by Helene Løvstrand Svarva, NTNU Vitenskapsmuseet.

Tree-ring chronologies are constructed by starting with living trees, for which the age of every annual ring is known from pith to bark. Then, timber from a building can be added, for which the outermost (youngest) rings grew at the same time as the innermost (oldest) rings of the living trees. Where the tree rings overlap, the living trees and the timber will have comparable growth patterns. This is how the age of the timber can be identified, and the time span of the tree-ring chronology can be extended. This process is called “cross-matching” and is the key principle of the dendrochronological method. When cross-matching is used on increasingly older material, the tree-ring chronology can be extended as far back in time as there is available timber.

Three methods are used to ensure the reliability of cross-matching: statistical tests, visual matching, and replication. Statistical methods are used to quantify the certainty of the visual match, and tree-ring sequences that give acceptable matches and replicate each other are averaged into a mean

chronology for the building or object that is to be dated. Usually, six to ten contemporaneous logs of the same tree species are considered adequate replication. The samples must be well-preserved and without breaks from pith to bark, and they should have enough rings, depending on the climate sensitivity of the tree, to give an adequate basis for comparison. If an acceptable statistical and visual match can be made between the mean chronology and several independent master chronologies, the building can be dated. For quality control purposes, both the samples and the ring-width measurements must be stored and kept available for verification by other tree-ring laboratories or by alternative dating methods. It is not unusual that timber for buildings has been felled over a few years, or that timber has been reused in connection with remodeling or repair of buildings.

Because of local differences in climate, independent tree-ring chronologies must be made from many regions of Norway. A network of regional chronologies also allows dendroprovenancing, i.e. finding the provenance of timber through cross-matching. This is of importance for objects or buildings that has been moved from one region to another.

In Norway, pine and spruce are the most common building materials and both can be dated by dendrochronology. In addition, oak is sometimes used in buildings in Sørlandet and parts of Vestlandet. Samples of oak must be dated by oak chronologies from their respective regions.

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