

DENDROCHRONOLOGICAL INVESTIGATION IN NORWAY

TERJE THUN

University of Trondheim, Department of Botany
N-7055 Dragvoll

In 1980 a tree-ring laboratory was established at the Department of Botany, University of Trondheim, on the initiative of professor Ulf Hafsten. The laboratory was supported economically by the Norwegian Research Council for Science and the Humanities (NAVF).

The task of the laboratory has so far been to date dendro-samples stored after archaeological excavations carried out in Bergen, Oslo and Trondheim. The material consists of several thousand disks from old constructions. Some of the disks have been stored for as much as 30 years. So far all the treated samples refer to pine (*Pinus sylvestris*). Till now the tree-ring widths of nearly 1000 disks from the city excavations in Oslo, Bergen and Trondheim have been measured. This work has so far resulted in floating chronologies from the different sites, i.e. chronologies based upon internal dating of the logs. One example is a 304 year long floating chronology (fig. 1), based upon 180 of the nearly 1600 logs stored after the excavations at 'Bryggen' in Bergen, the characteristic row of old timber buildings at the old harbour of the city (Thun, 1984). 'Bryggen' is a Mediaeval trade center which during the centuries has suffered several fires, the last one in 1955. But from the ashes, new activity started every time. After the last fire an area of more than 4000 m² has been excavated, exposing numerous finds of great historical interest. According to Asbjørn E. Herteig, the leader of the excavation, the finds give contact with the everyday life, and more detailed than any written sources. The excavations at 'Bryggen' lasted out the 1960-ties, and since then the finds have been subject to scientific examination. What the dendrosamples concern a cooperation is just now going on with Trondheim Radiological Dating Laboratory (RADDAT), in an attempt to obtain an absolute date of the floating chronology established for part of the Bryggen material. Parallel with this, intensive work is going on to obtain an absolute dating of the floating chronology also by means of dendrochronological methods. Thus, two assistants are at present measuring tree-rings in old buildings (røykstover) in the Voss area, east of Bergen.

Dendrochronological dating is based on the principle that the tree-ring widths show a similar pattern as the fluctuation in the limiting climate factor, which in the Bergen area is the temperature. However, the growth of conifers, here pine, is known to be very sensitive to nonclimatic influences. Therefore, the measured tree-ring widths have been standardized, by calculating a correction curve based upon 3 year running means (Eidem, 1953: 85). The standardized series, indices, appear by dividing each ring width by the corresponding value of the correction curve.

In addition to the standardization program a computer program has been established for internal comparison of the tree-ring patterns. This program is based upon "the

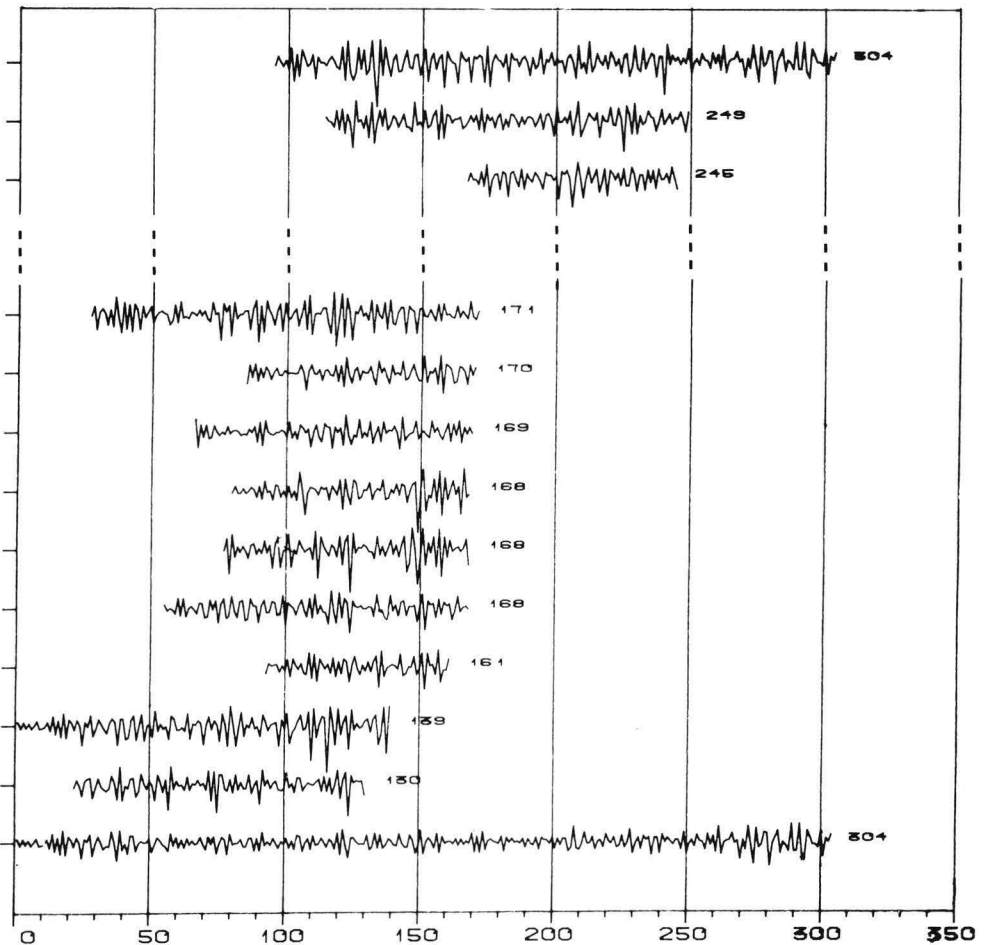


Fig. 1. Diagram showing some of the dendrochronologically treated logs from Bryggen in Bergen, forming the floating chronology at the base of the figure.

product moment correlation coefficient” and the students t test (Baillie and Pilcher, 1973: 11), as well as the percent agreement between the curves. Finally, computer programs have been developed for calculating the mean curve of matching tree-ring series and for plotting the curves. By means of these computer programs we hope within a few years to be able to finish the dendrochronological treatment of the material being stored and thereby be capable to start on new projects.

REFERENCES

- Baillie, M. G. L. and Pilcher, J. R., 1973. A simple cross-dating Program for Tree-Ring Research. *Tree-Ring Bull.* 33, 7—14.
- Eidem, P., 1953. Om svigninger i tykkelsesveksten hos gran (*Picea abies*) og furu (*Pinus sylvestris*) i Trøndelag. *Medd. Norske Skogforsøksv.* 12, 1—155.
- Thun, T., 1984. A Floating Tree-Ring Chronology from Bryggen in Bergen Based upon Dendrochronological Studies of 42 Pine Logs. *The Bryggen Papers No 1*, 96—100.