

## Comments for the authors

Online publication of tree-ring data which have in most of the European labs status "confidential" will open an opportunity to verify unpublished, but many times referred and cited dendrochronological standards. Court decision already opened tree-ring archive of Queens University of Belfast and authors took the opportunity to evaluate the Irish Oak Chronology. This chronology spanning 7272 years belongs to the most important European ultra-long chronologies. These chronologies and Irish in particular were used i.e. for 14C calibration. Only this fact demonstrates importance of presented paper, and of course interest to the Tree-Ring Research readers.

Authors followed QUB advices from publications, therefore it is hardly to say that they made independent chronology development. The main idea was however to follow the QUB methods and to test potential weaknesses of Irish Oak Chronology. I need to admit in this point that every long chronology has "weak and weaker" fragments characterized by low replication and caused by many reasons. One time window located in 10th c. BC gave a reason to report "a possible error" in chronology.

The QUB archive was published in form of raw measurement series. Tree-ring series are undated, they are probably not cleaned, it means they can contain juvenile wood, cockchafer signal, individual growth anomalies or even errors, which are invisible without accompanying documentation or metadata. Selected tree-ring series could be truncated during the chronology development. Without all this information supporting process of the construction of chronology it is not possible to follow exact this process and to obtain the same results.

I was using exactly the same dataset taken from authors website, but methods of chronology building applied in my lab, and I obtained significant values for links questioned by Ossowski Larsson & Larsson. They obtained t-value 2.8 between BelfastLong Version2 and English SwanCarr chronology while I obtained  $t_{BP}=4.7$  and  $t_H=4.5$  plus satisfactory visual match for the same pair of chronologies. More time spent by me on components of BelfastLong chronology could probably bring even better results. I can confirm that this is not the strongest segment of the Belfast Oak Chronology, but acceptable in my opinion. Brown and Baillie (2012) published recently a satisfactory explanation of problems associated with "the gap of 948 BC".

Regardless of my personal opinion on this particular link of Belfast Chronology I would like to stress that:

- satisfactory evidence is not provided in text nor in attachments. Link to authors personal website is not sufficient in this case;
- statistical evidence could be supported by visual presentation of tree-ring series;
- final conclusions are missing. The following questions should be answered:
  - (a) if there is really an error, is there any satisfactory alternative link?
  - (b) what are the consequences and implications of possible error?

The main European ultra-long oak chronologies were developed in 70s and 80s of the 20th c., when personal computers were not yet available and processing of large data-sets very limited. Therefore not all chronologies were excellent - case "Kirnsulzbach" is the best illustration. Questionable segments are better replicated since that time, and cross-correlations between chronologies verified them positively. However we cannot exclude possible errors, tree-ring



series qualified only because of lack of material, etc. Therefore I appreciate authors efforts to draw attention to the possible imperfections of tree-ring standards. I would like to encourage authors to present an evaluation of the main European chronologies (not only Irish), their weak/low replicated segments, questionable links, including type(s) of material used for their development (normal trees, bog trees, construction elements, high/low altitude tree-rings (not in Ireland), local/imported material, etc.) with necessary conclusions and supporting evidence.

