

## OAK DENDROCHRONOLOGY OF THE NEOHOLOCENE IN POLAND

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**A b s t r a c t.** In 1987 dendrochronological studies of subfossil oaks from southern Poland were undertaken at the Department of Stratigraphy and Regional Geology, University of Mining and Metallurgy, Cracow. The research resulted in the first standard chronology for southern Poland, produced from subfossil oak trunks from alluvia, which spanned the period 474 BC – 1555 AD. In the last years, on the basis of timbers from archaeological excavations, monuments of wooden architecture, as well as living trees, new, over 1000-year-long regional chronologies were constructed for the areas of Małopolska (910–1977 AD), Lower Silesia (780–1994 AD), and Wielkopolska (449–1994 AD). The chronologies exhibit high similarities to Polish chronologies from Gdańsk (East) Pomerania and Kujawy, as well as to chronologies from neighbouring areas. During the studies on construction of the standard chronologies numerous important archaeological, architectural, and art-historical objects have been dated. Analysis of frequency of occurrences of examined objects from particular periods enabled, e.g. identification of investments connected with the development of the Polish State. Analysis of the measured ring patterns gave rise to estimation of sapwood rings in particular regions. The whole set of elaborated standards was used as a tool for identification of origin of wood. Climatic changes, reflected in the measured and averaged ring patterns, were investigated through analyses of signature years, pattern similarities in time, included sapwood, and growth reductions related to volcanic eruptions.

„...remember, the trees don't lie – and they were there”

M. G. L. Baillie – *A Slice through Time*

## CARBON AND HYDROGEN ISOTOPE RATIOS IN CELLULOSE FROM OAK TREE-RINGS AS A RECORD OF PALAEOCLIMATIC CONDITIONS IN SOUTHERN POLAND DURING THE LAST MILLENNIUM

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**Abstract.** Stable isotopes ratios ( $\delta^{13}\text{C}$  and  $\delta\text{D}$ ) were investigated in late wood from annual growth rings of subfossil oaks as well as those actually growing in water habitats of the Vistula floodplain in the neighbourhood of Cracow. On the basis of these analyses isotopic time series of  $\delta^{13}\text{C}$  and  $\delta\text{D}$  for the last millennium have been compiled. The research has demonstrated that the observed  $\delta^{13}\text{C}$  changes are related to those of the amounts of rainfall in the months May-July, what can give possibilities of rainfall level reconstruction in the past. Correlation of  $\delta\text{D}$  with temperature has been observed only for the years with rainfall exceeding the average, but no clear relationships between  $\delta\text{D}$  and climatic conditions has been detected. The elaborated  $\delta^{13}\text{C}$  curve does not exhibit the depression related to human industrial activity in the 19<sup>th</sup> and 20<sup>th</sup> centuries.