



A HISTORY OF MINING ACTIVITY IN CELTIC AEDUAN TERRITORY, AND ITS ENVIRONMENTAL IMPACT (MORVAN Ū FRANCE)

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Described by Caesar in "*de Bello Gallico*" in 58 BC as one of the greatest and richest oppida of Gaul, Bibracte was the capital of the vast Aeduan territory. It was strategically located at the top of Mount Beuvray, which is also one of the highest points of the granitic Morvan. Geomorphological anomalies, such as wide trenches and gullies, have recently been discovered and interpreted as mining excavations. On this basis, some archaeologists have assumed that early settlers were attracted by the abundance of mineral resources. However, this assumption is not yet an established fact, because of the lack of clear field evidence. Proof of early local mining exploitation may have been destroyed, buried or masked when the city of Bibracte was built. As a consequence, we searched for indirect evidence, such as any impact of these metallurgical activities on the surrounding environment. Elemental and lead isotopic compositions were therefore measured in a 2m peat core sampled around Mount Beuvray (Glux, Port-des-Lamberts) recording the last four millennia of atmospheric deposition. Pollen analysis was also performed to verify the impact of local mining on nearby vegetation, if any. Pb isotopic and concentration profiles show anthropogenic inputs starting from ca 1300 BC, and intensifying during Aeduan occupation (ca 200 BC - 20 BC). After a long phase of recession, inputs start again during the 11th century, and finally increase exponentially from the Industrial Revolution to present times. Compared to Zn, Cu and

Sb, which do not present clear trends, the integrity of the lead signal is demonstrated by frequent and spectacular changes in the isotopic feature of the anthropogenic component, so that the isotopic profile cannot be explained by post-deposition migration processes. The origin of the pollution is local. Each phase of activity comes with a drastic fall of *fagus* taxa, interpreted as a selective deforestation consequent to the increase in energy demands. Atmospheric long range transportation from Rio Tinto, often invoked as the major lead source during Antiquity, is obliterated here by local emissions. These findings tend to confirm the archaeological hypothesis concerning the attractive role of mineral resources. For the first time, evidence of mining and/or smelting activities from the Bronze Age onwards has been established on this site.