



## Scientific analysis of a preserved head of hair at Romsey Abbey, UK



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### ABSTRACT

This paper presents the results of a scientific investigation on a preserved head of hair, discovered in 1839 inside a lead coffin beneath the Norman Abbey of Romsey (Hampshire, UK). Accelerator mass spectrometry (AMS) radiocarbon dating, modelled to account for dietary marine protein intake indicated by stable isotope analysis ( $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$ ), suggests that this individual died between 895–1123 calAD (95.4% probability). A wooden ‘pillow’ found supporting the hair produced a date of 895–1016 calAD (95.4% probability). These results suggest that this burial dates from the end of the ninth century to the early twelfth century, placing it in the late Saxon or immediately post-Conquest era. Analysis by Gas Chromatography/Mass Spectrometry (GC/MS) of residue adhering to the hair surface indicates the presence of *Pinacea* resin, deriving either from funerary ritual or hair care during life.

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### 1. Introduction

The original date of foundation of Romsey Abbey is traditionally given as c.907 CE by Edward the Elder (Coldicott, 1989), although the exact date is debated (Collier, 1990). The present Abbey church dates largely to the Norman period. Excavations have revealed a smaller late Saxon stone abbey beneath the present construction, in addition to a number of earlier phases of occupation dating from the middle to late Saxon era (Scott, 1996).

A head of human hair is displayed in the Abbey (Fig. 1). According to archival records, the remains were discovered by gravediggers in October 1839, underneath the west end of the south nave aisle (Major, 1862; Scott, 1996). An account written by the Churchwarden at the time, William Jenvey, describes the event (Hallett, 2015):

*“We came about five feet below the pavement in contact with a leaden coffin, deposited in the earth, but without inscription of any kind. It was not of the shape now in use, but eighteen inches wide at the head, and tapered gradually down towards the feet, the width of which was thirteen inches only. The extreme length was five feet and the depth one foot three inches. It was made of very thick lead, and might possibly weigh nearly two hundred weight – the metal being about ten pounds to the square foot. The coffin was put together in a very substantial manner, the seams being folded over each other and welded: it was probably*

*constructed before the use of solder was known. From lying so long in the earth, the lid was much decayed and bore a strong resemblance to the original lead ore...No bones whatever, either entire or broken were found within; but there had been preserved an oak shell, which was quite decayed, and mouldered into dust when exposed to the air. On removing the lid, a beautiful head of hair, with a tail plaited about eighteen inches long, evidently that of a young female, was discovered. The hair was lying on a block of oak, cut out hollow on purpose to receive the head of the corpse, when deposited within its narrow abode. The hair was in perfect form and appeared as though the skull had only been recently removed from it. The coffin is preserved in a safe and conspicuous place in the church (the apsis at the eastern extremity of the south aisle), and the hair is in a portable glass case, and lies on the same block of oak which has been its pillow for centuries.”*

Details of the discovery were published a year after the find in *The Gentleman's Magazine* (August 1840), along with an illustration of the hair and the lead coffin. The article records that, by this time, the inner wooden lining had already been cut up and distributed as souvenirs. At a later stage, the lead coffin was also lost (Walker, 2013). A later account written by the sexton, John Major, describes how the workers excavated through 5 ft of concrete and 1.5 ft of gravel, whereupon they uncovered the coffin. The Vicar was consulted and it was decided to ascertain whether any remains lay within it (Major, 1862):

*“...making a hole on the Top...I Thrusted my hand to the head of the coffin to Find the skull. I found no bones but a scalp of Feameal haire as Bright as any Living Ladies haire I ever seen. there was 1 Finger Bone. it became dust immeadiately the aire came to it. The coffin was mad of*

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**Fig. 1.** The head of hair and wooden pillow found inside a lead coffin excavated within the Abbey in 1839 (photo: F. Green). The remains are presently displayed in a trapezoidal wood and plate-glass box.

*very curious workmanship the Sides was welted together the Top shut on the same as a Bandbox."*

The Reverend Edward Berthon, Vicar of Romsey from 1860 to 1892, later described in his memoirs that the hair was presented by Mr. Major to his predecessor, the Reverend Vaux, who threw the remains away (Berthon, 1899: 155):

*"...the men came upon a very ancient coffin of lead, roughly hammered into shape. In this rude receptacle was found the most perfect and exquisitely beautiful chevelure of a young girl, the lovely auburn hair in wavy masses in front, and a perfect plait behind, as glossy as it had been in life. Major took it to the vicar, who threw it into the coal-hole, from whence the former rescued it, and had it enclosed in a glass case; but it was too late, the mischief was done, and its beauty gone for ever. The curious coffin was sold for old lead. Now, when did this girl live, and die? Nothing but dust remained of bones or clothing, only a block of oak for the head to rest on, and the coffin was lying north and south. All things point to the conclusion the burial took place during the Roman occupation, which ceased A.D. 426."*

Reports from excavations carried out at the Abbey from 1973 to 1991 suggest that, if the recorded location and depth are accurate, then this burial may have pre-dated the late Saxon Abbey that lies beneath the present Norman building, and may perhaps be contemporary with additional graves excavated in 1975 near to the north-west corner of the subsequently constructed late Saxon Abbey (Scott, 1996).

## 2. Analytical strategy

Despite estimates of a mid-late Saxon date for this burial based on its recorded archaeological context, there have remained several unanswered questions regarding this intriguing survival.

- Firstly, the time period to which this burial dated was not known with any certainty.
- Secondly, nothing was known of the likely diet this individual consumed, which could indicate whether they were a lay person or an ecclesiastical figure.
- Thirdly, the identity of a black substance adhering to the hair was not known.

This new investigation will use AMS radiocarbon dating (Bronk Ramsey, 2008; Wood, 2015) to identify the age of the surviving hair and the wooden block on which it rested.

Analysis of stable isotopes of carbon and nitrogen preserved in the hair keratin will also be undertaken in order to inform the calibration of the radiocarbon date, thus providing an insight into the likely diet of the deceased. This is a widely used technique for the investigation of palaeodiet in archaeology (Lee-Thorp, 2008). The carbon isotopic ratios ( $\delta^{13}\text{C}$ ) of tissues can provide insights into the types of plants consumed directly by the organism studied and/or through the organisms they consume, using knowledge of the isotopic fractionation of carbon involved in different photosynthetic pathways (O'Leary, 1988). Nitrogen isotopic ratios ( $\delta^{15}\text{N}$ ) can be used to study the position of an organism in the food chain, since increasing trophic level leads to enrichment in  $^{15}\text{N}$  (Bocherens and Drucker, 2003; Hedges and Reynard, 2007).

Another area of interest is the nature of the dark residue adhering to the hair. Chemical characterization of this residue using Gas Chromatography/Mass Spectrometry (GC/MS) will be performed to possibly provide insights into funerary ritual, treatment of hair during life, and perhaps even the history of the hair since its discovery.

A summary of the analyses performed in this study is shown in Table 1.

## 3. Materials and methods

### 3.1. Materials

#### 3.1.1. Archaeological artifact

The head of hair has maintained the shape of the head, perhaps in part due to the survival of fragile areas of scalp. There is long and well-preserved ponytail, which remains plaited. The hair was found resting on a rectangular wooden block, upon which it is still displayed in a wooden box at the West End of the building (Fig. 1).

For this study of the head of hair, the box was examined to establish its construction and the best way to remove the glass to gain access to the contents. A layer of brown putty holding the plate-glass in place was removed, revealing an older layer of white putty. This allowed the oak beads and the nails securing them to be removed for further examination. A scalpel and knife were then used to remove the putty sealing the glass onto the box. Before lifting the glass, precautions were taken to avoid contamination of the hair with modern DNA, in case this is investigated in future. This included a full protective suit, face mask and double gloves. Sterilized laboratory scissors and tweezers were used to remove a 50 mg sample of hair for radiocarbon dating and stable isotope analysis, in addition to a c.40 mg sample of wood from the 'pillow'. In addition, a small sample of dark-coloured residue was removed from the right side of the head for analysis via GC/MS. This substance appears

**Table 1**

Summary of samples taken and analyses performed in this investigation.

Lab ref.	Description	Analyses performed	Technique
P-39725	Hair	Isotopic measurement $^{14}\text{C}$ dating	MS AMS
P-39726	Wood	Isotopic measurement $^{14}\text{C}$ dating	MS AMS
RomRes	Residue on hair (right side)	Material characterization	GC/MS

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