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A multi-method luminescence dating of the Palaeolithic sequence of La Ferrassie based on new excavations adjacent to the La Ferrassie 1 and 2 skeletons

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ABSTRACT

A new interdisciplinary project was initiated to excavate a portion of the Palaeolithic site of La Ferrassie left intact by earlier excavations. One of the aims of this project was to provide chronological information on the succession of Middle and Upper Palaeolithic layers, as well as on the skeletons unearthed by Capitan and Peyrony in the early 1900's. We report here preliminary results on the lithics, faunal remains, site formation processes, and on the stratigraphic context of the La Ferrassie 1 and 2 skeletons that were found adjacent to our excavations. Finally, results from luminescence dating of the sediments and a preliminary set of radiocarbon ages are presented. Quartz OSL, both at the multi-grain and single-grain levels of analysis, and post-IR IRSL of feldspar at various stimulation temperatures are compared. The quartz/feldspar comparison revealed a bleaching problem for the quartz OSL (and the feldspar pIRIR signals) from Layer 2; as a consequence, the age of this Layer was determined using a minimum age model.

A Mousterian industry with bifaces, at the base of the sequence, has been dated between 91 ± 9 and 44 ± 3 ka. The Ferrassie Mousterian layers are attributed to MIS 3, between 54 ± 3 and 40 ± 2 ka, and thus appear very late in the final Middle Palaeolithic of the region; furthermore, these ages constrain the chronology of the La Ferrassie 1 and 2 skeletons, which have been attributed to one of these Ferrassie Mousterian layers. The Châtelperronian layer is dated to 42 ± 3 ka and the Aurignacian to 37 ± 2 ka. Implications of the ages for the La Ferrassie 1 and 2 skeletons, and for the variability of late Mousterian, are discussed.

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1. Introduction

For over a century, the Palaeolithic site of La Ferrassie has been the focus of numerous excavations and studies. Located in a small tributary valley of the Vézère River in southwest France (Fig. 1), this site has yielded rich Middle and Upper Palaeolithic lithic assemblages, faunal remains, as well as two nearly complete Neanderthal skeletons and additional partial skeletons. The human remains make La Ferrassie one of the more important sites for the study of Neanderthal morphology and one of the more important data sets when discussing Neanderthal treatment of the dead (Capitan and Peyrony, 1921, 1922; Peyrony, 1934, 1921; Vandermeersch, 1976; Harrold, 1980; Heim, 1982a, 1982b, 1976, 1968; Chase and Dibble, 1987; Bar Yosef, 1988; Smirnov, 1989; Straus, 1989; Gargett, 1989, 1999; Duday et al., 1990; Lindly and Clark, 1990; Binant, 1991a, 1991b; Deufleur, 1993; Riel-Salvatore and Clark, 2001; Pettitt, 2002; Maureille and Vandermeersch, 2007; Langley et al., 2008). The site also gives its name to one variant of the Mousterian rich in scrapers made on Levallois flakes, and the Aurignacian portion of the sequence was originally used to define its stages (Peyrony, 1934; Bordes, 1957, 1961; Sonneville-Bordes, 1960; Delporte, 1984).

Thus there are many reasons why La Ferrassie has been studied in detail. However, aside from some radiocarbon ages completed on Upper Palaeolithic layers from excavations led by Delporte in the 1970s, this key site has remained undated. To address this lack of chronology, we undertook a new interdisciplinary excavation (led by AT) that started in 2010. The first season resulted in the discovery of new deposits in the western portion of the site, very close to the find location of the La Ferrassie 2 skeleton; a great part of the La Ferrassie sequence is represented in these new deposits. Since then, new excavations have been undertaken (i) to re-evaluate the stratigraphic sequence of this area, with a particular emphasis on site formation processes and their implications for the context of the Neanderthal skeletons, (ii) to re-assess the techno-complexes and in particular the eponymous Ferrassie Mousterian in the current context of Mousterian occupations in SW France (Turq et al.,

Fig. 1. Regional map, indicating the location of La Ferrassie and other important Palaeolithic sites in the Dordogne region of France.