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A jadeitite axehead in the midst of the famous Neolithic flint mines of Spiennes?

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Abstract

More than a century ago, Alfred Lemonnier, Director of phosphatic chalk quarries in the Mons region, donated a jadeitite axehead from Spiennes to the State among a small collection of 'knapped flint'. Originally, this artefact was 12 to 15 cm long. Several scientists tested various ways – destructive or non-destructive – to determine this green stone until they discovered their origin in the ultimate end of the Alps near Genoa (Italy), thanks to *Projet JADE*. But this raises a new question: how to explain the presence of an almost complete axehead of jadeitite in the midst of the flint extraction site of Spiennes?

Keywords: Spiennes mine (Hainaut, Belgium), jadeitite axehead, Late Neolithic, thin section, spectroradiometric analysis, sourcing.

Résumé

Il y a plus d'un siècle, Alfred Lemonnier, Directeur de carrières de craie phosphatée de la région de Mons, fit don à l'État d'une hache de jadéitite originaire de Spiennes au milieu d'une collection de « silex taillés ». À l'origine, cet artefact devait mesurer de 12 à 15 cm de long. Plusieurs scientifiques ont testé différentes manières – destructrices ou non-destructives – de déterminer cette roche verte jusqu'à retrouver l'origine à l'extrémité ultime de l'arc alpin près de Gênes (Italie), grâce au Projet JADE. Mais une nouvelle question apparaît : comment expliquer la présence d'une hache presque complète en jadéitite trouvée au milieu des exploitations de silex de Spiennes ?

***Mots-clés** : Minière de Spiennes (Hainaut, Belgique), hache en jadéitite, Néolithique récent, lame mince, analyse par spectroradiométrie, source géologique.*

Over a century ago, businessman Alfred Lemonnier donated several small but prestigious collections to the Natural History Museum of Brussels (now the Royal Belgian Institute of Natural Sciences, RBINS) while he served as Director of a phosphatic chalk quarry in the Mons area for the Solvay company (Fig. 1). An axehead made of green stone, the subject of this article is part of a collection of 'knapped flint' that the museum acquired on March 28th, 1904. This object would originally have been more than 12-15 cm long, allowing for its missing butt end.

Walter Campbell Smith (1963, p. 150), a member of the Department of Mineralogy in the formerly named British Museum (Natural History, BM/NH) – now The Natural History Museum – had taken a slice from the fracture surface of

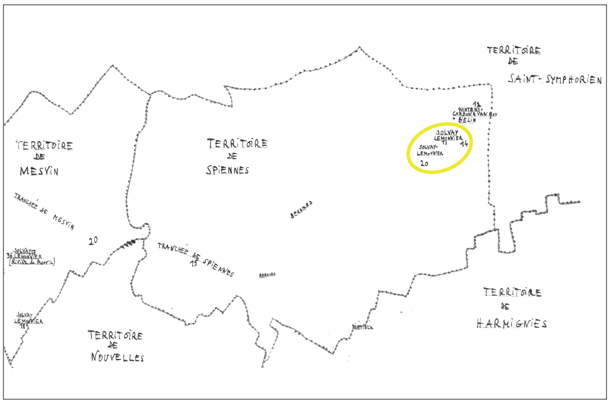

Fig. 1 – Location of the phosphatic chalk quarries managed by Alfred Lemonnier for the Solvay Company, shown against a map of the old commune of Spiennes. Archive: Jean de Heinzelin, RBINS.

this axehead in order to make a petrological thin section slide (or slides), and he concluded that the type of stone was very close to other specimens that had come from archaeological sites in Brittany, France and England (Fig. 2). The remaining part of the slice that W. Campbell Smith had cut from the axehead, and kept in the BM/NH, was analysed for *Projet JADE* (Pétrequin *et al.*, 2012), using reflectance-scatter spectroradiometry. The resultant spectra were unfortunately of poor quality because of the small surface area available for measurement. Subsequently, additional spectral analyses were performed on the axehead itself, first in 2010, then in 2013 with a more powerful instrument. These analyses confirmed and clarified the original identification of the raw material (Fig. 3). It was indeed a characteristic/typical jadeitite,

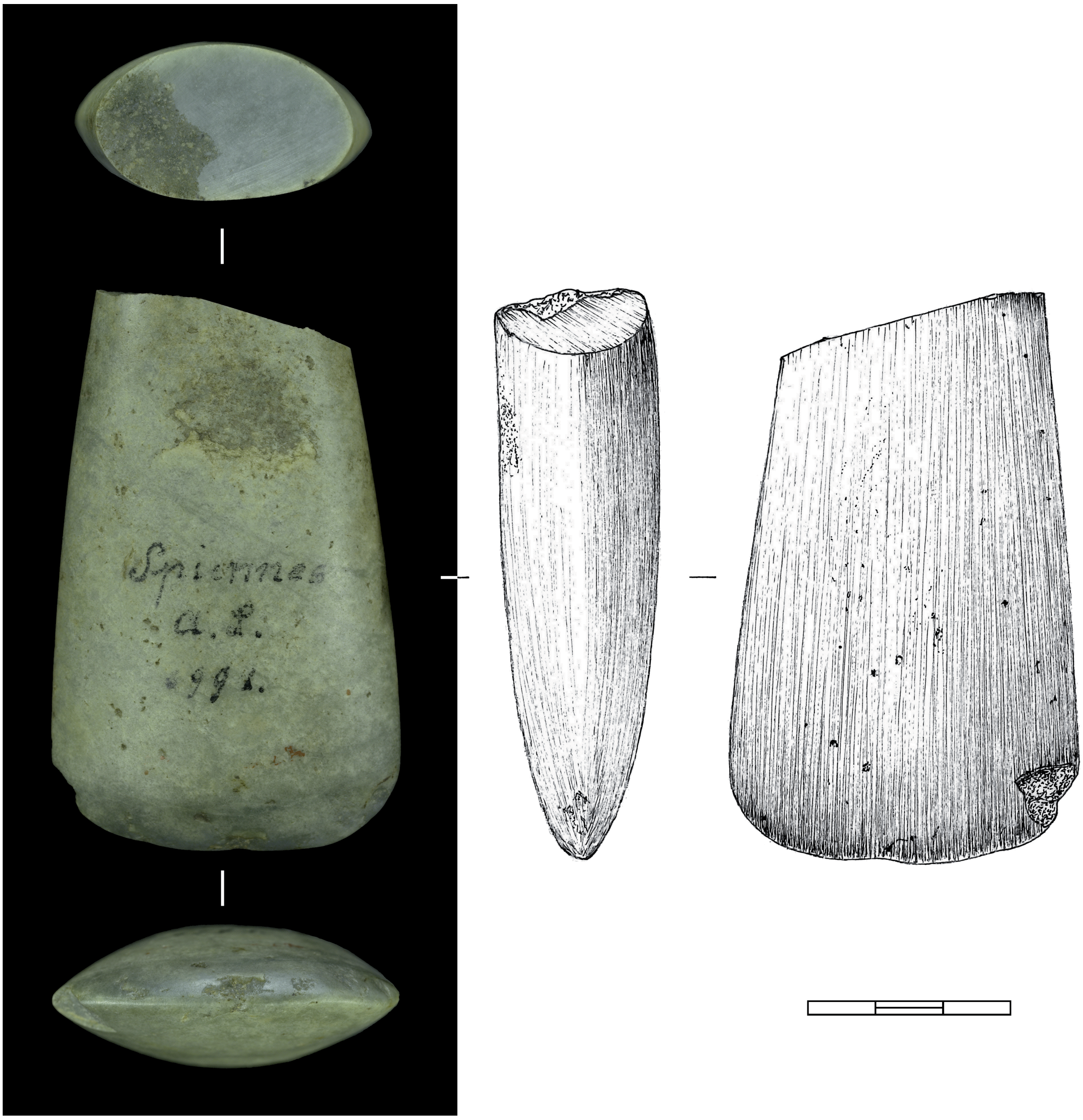

Fig. 2 – Jadeitite axehead found at Spiennes.
The photograph shows where it had been sliced for preparing one or more thin-section slides.
Drawing: Anne-Marie Wittek, ADIA/RBINS. Photographs and computer imagery: Éric Dewamme, RBINS.

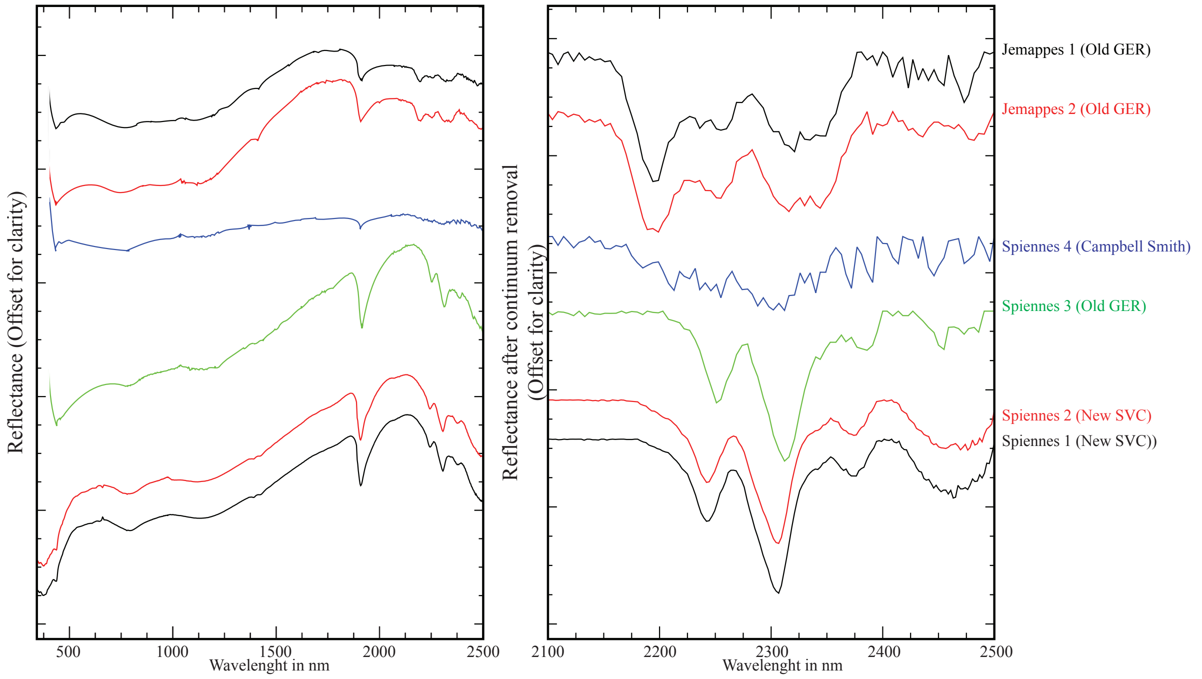

Fig. 3 – Spectra of axeheads from Jemappes and Spiennes (Mons).
Spectra Jemappes 1 (Jema_001) and Jemappes 2 (Jema_002) were determined using the old GER spectroradiometer; spectrum Spiennes 4 (Campbell Smith, Camp_008) is from the slice cut from the Spiennes axehead - note the significant noise - and spectrum Spiennes 3 (IRSN_038) was also determined using the old GER spectroradiometer. Spectra Spiennes 1 (IrScN_SVC_009) and Spiennes 2 (IrScN_SVC_008) were taken using the new SVC spectroradiometer. On the left, reflectance spectra on full-scale wavelength. Spectra taken with the old GER spectroradiometer are from 400 to 2500 nm. On the right, the same spectra between 2100 and 2500 nm, after continuum removal. Note the important absorption around 2194 nm indicating a white mica on Jemappes 1 and 2. The absorptions around 2306 (strong) and 2376 nm (medium) on the others indicate a Na-amphibole, probably glaucophane (slightly different in Jemappes 1 and 2).

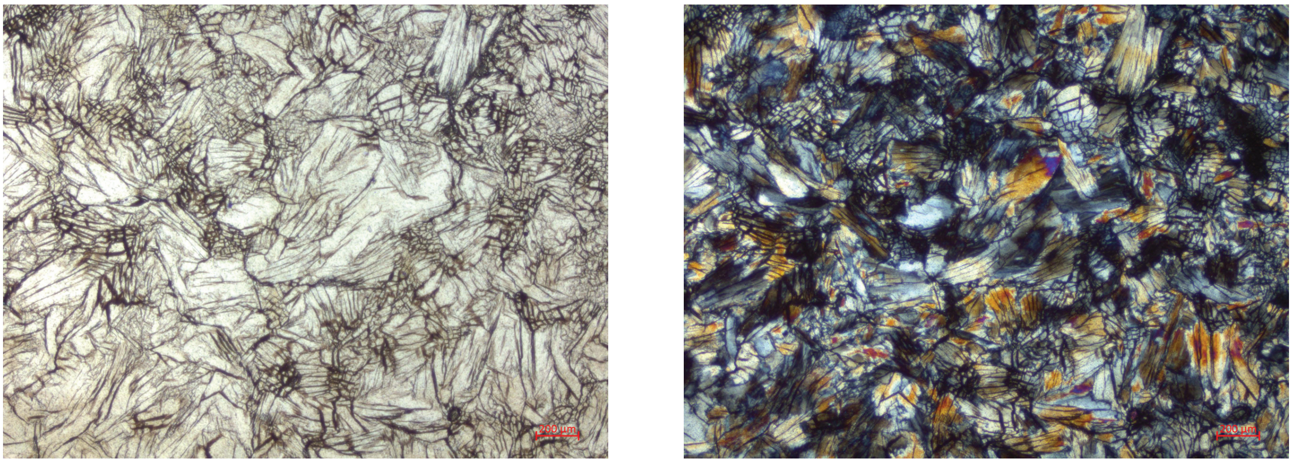

Fig. 4 – A second jadeitite axehead, found at Jemappes, was in the possession of the *Société de Recherche Préhistorique en Hainaut* (SRPH), along with a thin section. There are several indications, however, to show that this thin section actually belongs to the Spiennes axehead, rather than to the Jemappes example. On the left, the thin section is shown in natural light; on the right, in plane-polarised light. Microphotography: Éric Goemaere, GSB/RBINS.

micaceous and retromorphosed, from the blue schists facies (Fig. 3-5). The most convincing comparisons with the *Projet JADE* reference database of Alpine rocks indicate that its origin is likely to lie in the Group of Voltri, and more specifically at the west of the Beigua massif, near Genoa (Italy).

Between 1963 and when the last spectroradiometric analyses were undertaken half a century later, there have been significant shifts in attitudes towards archaeological artefacts – with a decisive move away from destructive techniques towards the use of non-destructive techniques – and also in the goals of stone axehead research. When W. Campbell Smith was writing, the goal was to characterise axeheads in the hope that this would help to locate the as-then unknown primary source areas in the Alps. Now, thanks to *Projet JADE*,

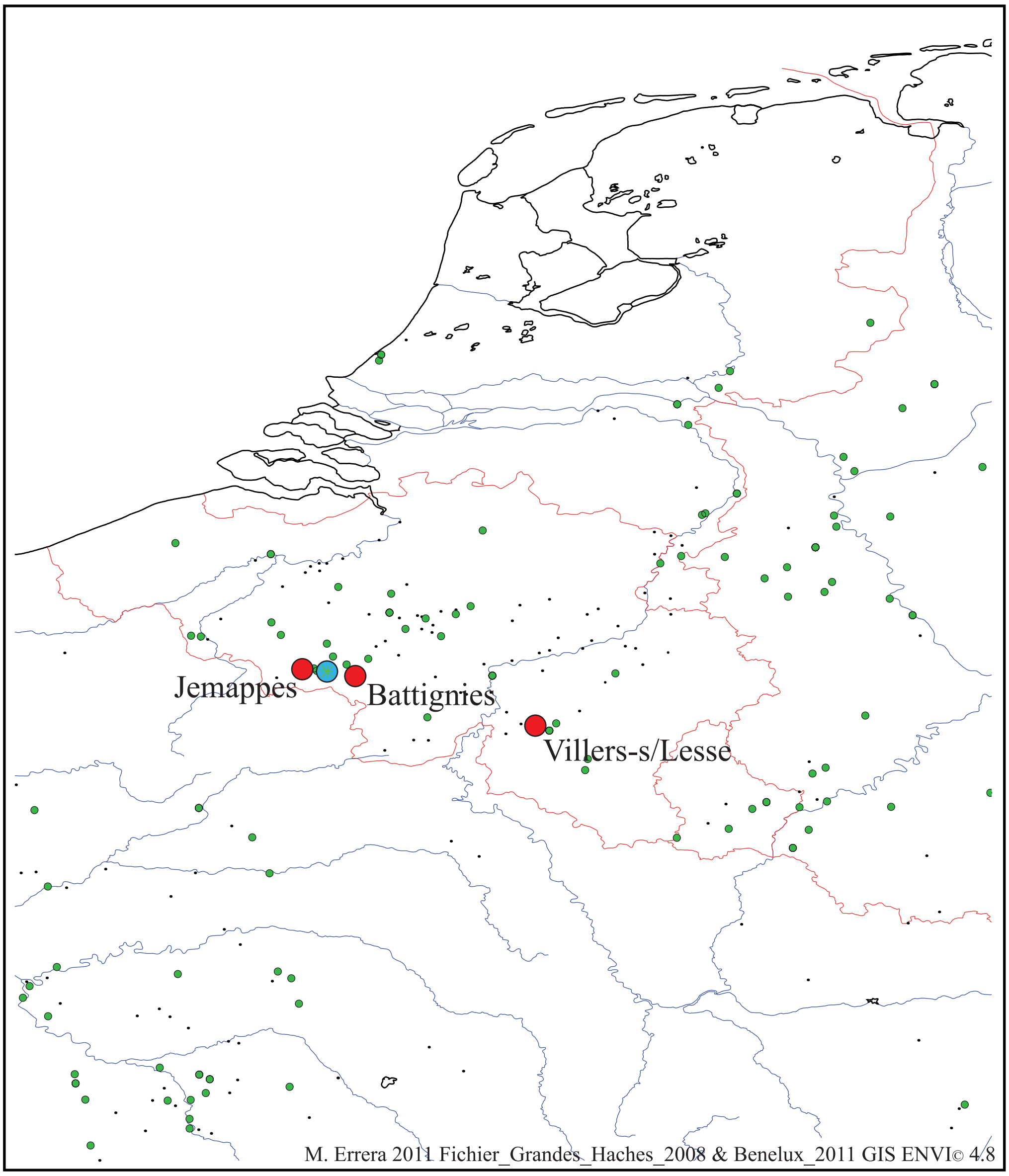

Fig. 5 – Location of the axeheads from Spiennes, Mons (blue dot) compared to others recently analysed by spectroradiometry (red dots): Jemappes (Mons), Battignies (Binche) and Villers-s/Lesse (Rochefort). The map also shows axeheads (>13.5 cm long) from the *Projet JADE* database (black dots) and, among these, ones analysed by spectroradiometry (green dots, Source GIS-JADE and ERRERA *et al.*, 2011).

the high-altitude quarries have been located and extensively studied; and with spectroradiometric analyses, it no longer makes sense to damage a museum piece in order to determine its origin; this can be achieved (at least in most cases) by simple reflection of the light on a specimen.

Now that the stone's origin has been determined, a new and fascinating question has emerged: how can the presence of a jadeitite axehead found in the middle of a production site of grey flint axeheads in Spiennes be explained?

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