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Instances of animal traction in the Neolithic village of Chalain (Jura, France). End of the 31st century BC.

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ABSTRACT: The discoveries reported in this paper relate to an occupation of the lake-shore village of Chalain 19 (Jura, France). In this hamlet dated to the 30th century BC (Horgen culture) associated to an isolated house, a wooden sledge and, laying at the front of it, a double oxen hornyoke were found. Together with a 115 m long wooden trackway these pieces constitute the first instances of animal traction known from the Neolithic of northern France.

KEY WORDS: NEOLITHIC, LAKE DWELLINGS, ANIMAL TRACTION, SLEDGE, HORNYOKE

RESUMEN: Los descubrimientos registrados en este trabajo se refieren a una ocupación del poblado lacustre de Chalain 19 (Jura, Francia). En esta aldea, datada en el siglo XXX a.C. (cultura Horgen), asociadas con una casa aislada se recuperaron un trineo de madera y enfrente del mismo un yugo doble. Estos hallazgos junto con una pavimentación en madera alzada de 115 m de longitud constituyen los primeros casos de tracción animal documentada en el Neolítico de la Francia septentrional.

PALABRAS CLAVE: NEOLÍTICO, POBLADOS LACUSTRES, TRACCIÓN ANIMAL, TRINEO, YUGO

INTRODUCTION

The lakes of Chalain and Clairvaux are located in the Combe d'Ain, an enclosed alluvial valley, at an altitude of 500 metres, within the plateaux of the French Jura (Figure 1). For many centuries, these have been densely populated areas. A series of excavations, completed by surveys and systematic soundings, has enabled the reconstruction, for each one of these two lake basins, of a long chronological sequence of lake-dwellings from ca. 3800 BC to ca. 850 BC (all dates are expressed in solar years) (Giligny *et al.*, 1995; Pétrequin, 1997; Pétrequin *et al.*, 1998, 2001; Pétrequin & Pétrequin, 2000). Between 1995 and 2002 comprehensive excavations were carried out at one of these villages, Chalain 19, situated on the western edge of Lake Chalain. Altogether, the excavations have unearthed a third of the dwelling area, together with nearly all the fencing system encircling the village on the solid ground side and the whole of a 115 metres long wooden trackway linking the village to the solid ground over the lakeside and marshland.

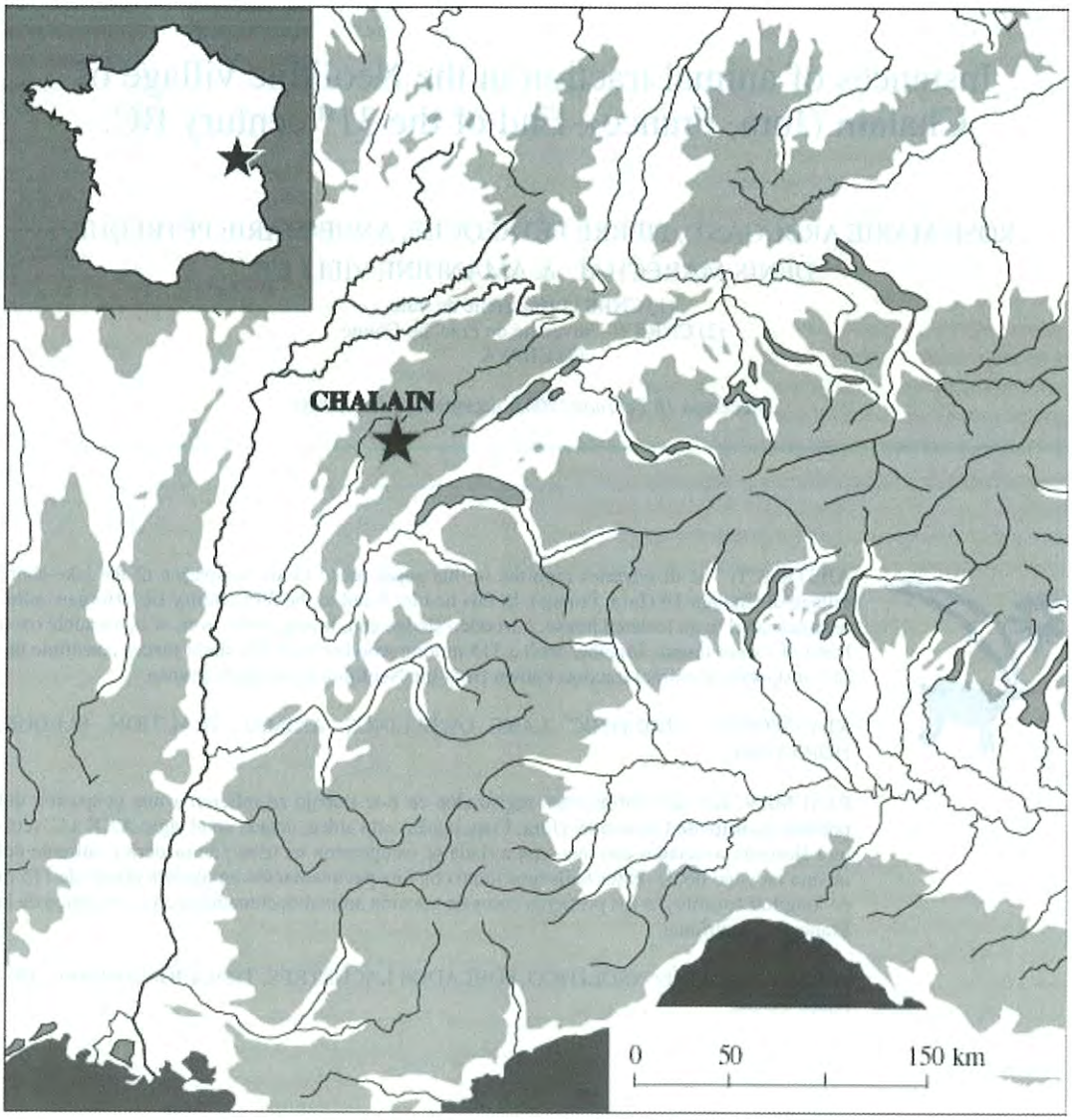

FIGURE 1
Location of the site of Chalain (Jura, France).

THE VILLAGE OF CHALAIN 19

The village saw two successive occupations, the former during the first half of the 32nd century (Horgen culture) and the latter at the junction of the 31st and 30th BC. The discoveries which form the subject matter of this paper all relate to the latter occupation. The village of Chalain (Figure 2) is a hamlet consisting of a few rectangular houses on wooden piles of split oak, on either side of a central street. Between the built up space and the lake stands an isolated house of the same type of construction. With his three partition, this rectangular building, 8 metres long and 4,5 metres wide, is identical in construction to the other houses in the village and yet differs from these by certain characteristics linked to the nature of the activities carried out inside it. Huge accumulations of ancient seeds (Schaal, 2000), terracotta weights from a vertical loom, a large stock of burnt stones

and a flint of exceptional quality (a pointer of social status); none of these characteristics can be found elsewhere in the village (Pétrequin *et al.*, 1998, 2001; Pétrequin & Pétrequin, 2000). It is in front of this isolated building, a slightly recessed, that a triangular sledge or slide-car, as well as a double oxen horn-yoke, were found. These pieces layed facing the lakeside, slightly outside the village area, in an often waterlogged area. It is thus not impossible that they were found in what was their storage site, under water, in order to ensure their preservation.

THE SLEDGE AND THE YOKE

The sledge was found fixed to the ground by a stake, and turned upside down (Figure 3). It was made of two long side-pieces of ash-wood, set at an angle, acting as runners where their divergent ends met the ground. At the top, where the two side-pieces converged to form the head of the implement, their ends were thickened and perforated, so that the two holes overlapped. The side-pieces were up to 289 cm long, and 130 cm apart at the bottom, where they would have slid along the ground, so that they may be referred to as "runners". The shaping of these runners was done with great care both as regards their shape and their evenness; they are slightly curved towards the back and fitted with mortises drilled close to the upper part so as to affix transverse bars, 5 of which were still found in situ. Traces of superficial carbonisation – aimed at hardening the wood – were observed on them. The runners were fastened together at the top of the implement using the holes in their thickened upper ends, whose inner parts show marks left by the friction of straps, probably made of leather. These characteristics bear

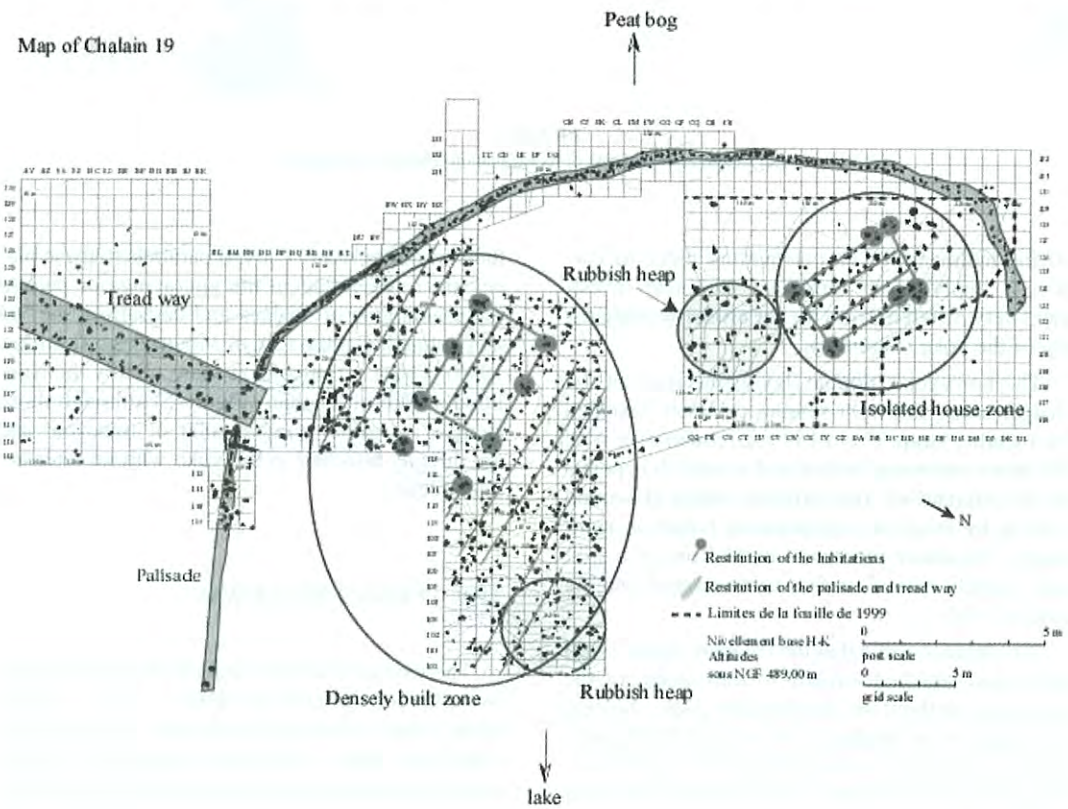

FIGURE 2
Map of the village of Chalain 19. The sledge was discovered just in front of an isolated house (drawing A. Viellet).

FIGURE 3
The sledge in the process of its excavation (Photo P. Pétrequin).

all the hallmarks of an outstanding piece of carpentry, implying an important technical investment very different from the far cruder workmanship of the yoke (Figure 4).

The horn-yoke, double, lay at the front of the sledge, along the right runner, probably fastened by a leather strap. Up to 133 cm remain of it with the upper end being broken and eroded. It is possible to estimate its total original length at around 1.60 m by using an extrapolation based on symmetry. The entire piece was carved out of a split oak, slightly curved, with a trimmed and roughly notched end.

It is inconceivable that the Chalain sledge could have been attached directly to the middle of the horn-yoke without an intermediate piece. Indeed, the width of the sledge (1.30 m between the runners) is too great to allow two oxen to pull it without getting in each other's way. Besides, the wear state of the runners at the back shows that the front of the sledge must have been raised from 0.50 to 0.90 m. This suggests that leather straps were used – note the wear marks inside the mortises – to play the part of the beam. Closest parallels to these pieces are to be found in the engravings or pecked representations of sledges and carts from the Val de Fontanalbe at the foot of Mount Bego (Lumley, 1995). These set in context more vividly the Neolithic sledge of Chalain (Figure 5) although those sledges are either quadrangular or trapezoid and are directly attached to the yoke with no intermediate piece.

THE WOODEN TRACKWAY

The wooden track at Chalain 19 is made up of two parallel stretches of stakes, 1.70 to 2.30 m apart, aimed at bearing low beams, and a cover of transversal planks. The first construction of this track is contemporaneous with the founding of the village and must therefore have been used to convey building materials across. Its life-span must not have been very long for quite rapidly the degradation of the covering planks must have been

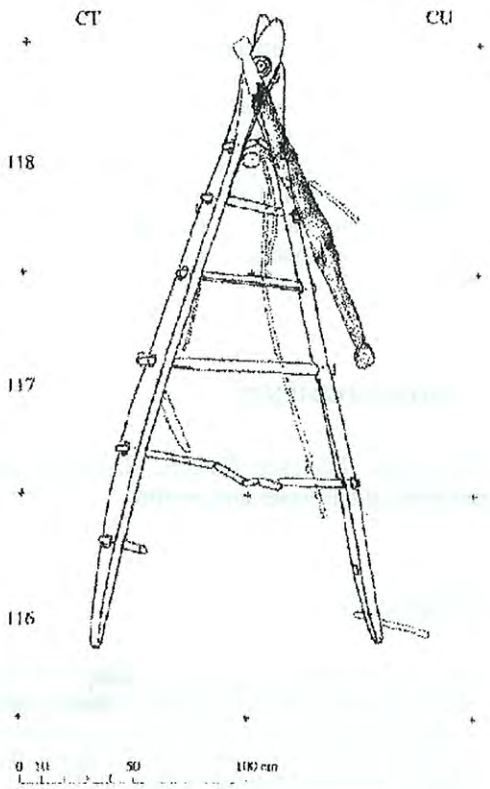

FIGURE 4
The yoke and the sledge after dismantling (drawing A.-M. Pétrequin).

such so as to force the conveyance to be carried out between the lines of stakes on plant litters, as witnessed by marks of trampling and partial groundfill noted throughout the track layout. Dendrochronological analyses reveal several periods of repair, which deal at the same time with the track, the fence and the village. It is thus very likely that the wooden trackway was used for animal traction, and, *a fortiori*, for the conveying of heavy or voluminous loads using the sledge, for short periods of time only, like one or two years after its construction or repair.

It seems plausible, looking at the chronology of wooden trackways in the north-western part of the Alps, that animal traction was used in the region as early as the 37th century BC (Pétrequin *et al.*, 1992) with the first track of Concise (Wolf *et al.*, 1999); thus, several centuries before more obvious evidence such as the earliest wheel, discovered on the site of Zurich-AKAD (Ruoff, 1981) and ascribed to the period of 3400-3200 BC, or this sledge from Chalain 19, from an even later period and dated through dendrochronology to ca. 3000 BC.

CATTLE FOR TRACTION?

The main characteristic of the site at Chalain 19, as well as that of all the other settlements from the 30th-31st centuries on the shores of Lake Chalain – all of these sites having revealed an abun-

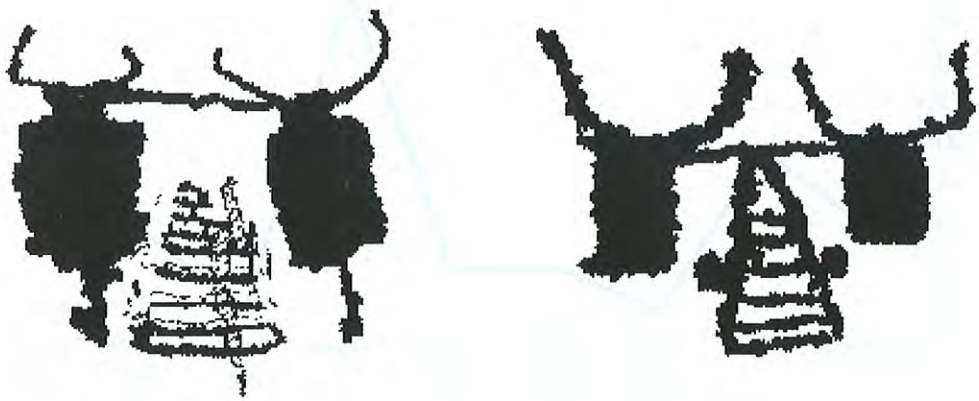

FIGURE 5
Engravings of the Val de Fontanalbe at Mont Bego. To the left a sledge; to the right a triangular two-wheeled cart (document Lumley, 1995).

dance of relatively well preserved fauna – is the large-scale exploitation of wild fauna and, especially, of the red deer. Among the domestic livestock, the ox competes most of the time with the pig and, only exceptionally, does it represent a very important source of the meat diet. However, the relatively modest representation of the ox in the faunal record is not in our eyes incompatible with its use for traction. What is suggested by the slaughter patterns is that a proportion of adult and old animals was spared (Figure 6), a group which is quite compatible with a use for traction. The preponderance of females, which is very clearly indicated by the metric data distributions, could be related to a preference for cows (Figure 7), which may already have been used also for their milk. Evidence of pathological stresses in these animals is extremely sparse, suggesting a low intensive form of exploitation of these cattle. They may have been few in number and are, therefore, less likely to show up in remains mostly composed of culinary waste. The mastery of husbandry techniques necessary for the maintenance and training of adult animals is, in any case, a prior condition to any exploitation of animal energy.

The relative morphological similarity between the sledge and the frames of two-wheeled carts suggests that the former could be based on an imitation of the first wheeled vehicles of south-western Germany. The particular setting of the sledge and the yoke within the village area – close to an isolated building, whose distinguishing features are its specialised activities (remains related to the working of plant fibres, presence of a loom...) and status markers – would also point to the need to take into account the social context in which the diffusion of such innovations may have occurred (Sherratt, 1981).

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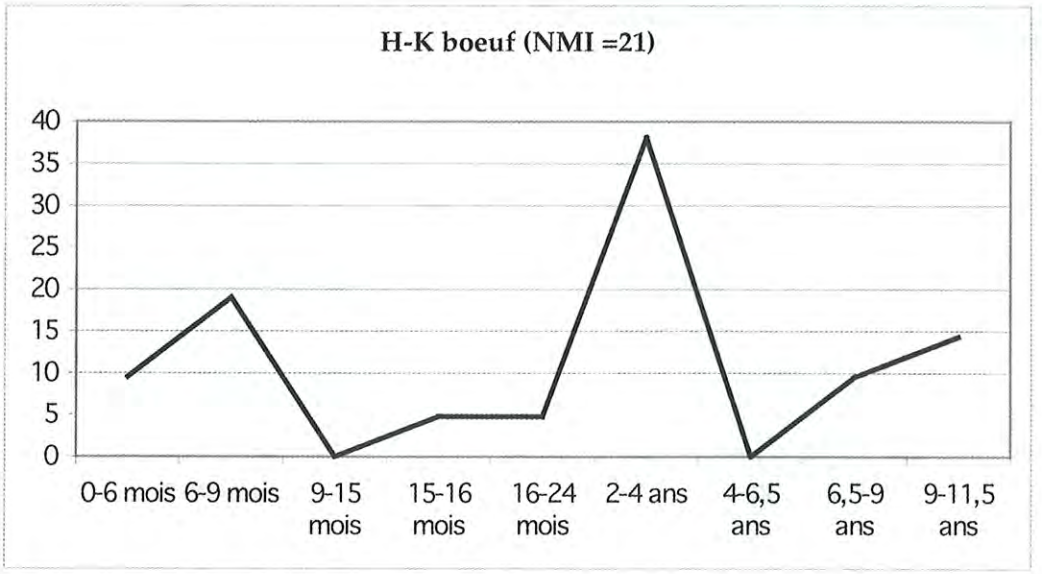

FIGURE 6
Slaughter patterns of cattle at Chalain 19.

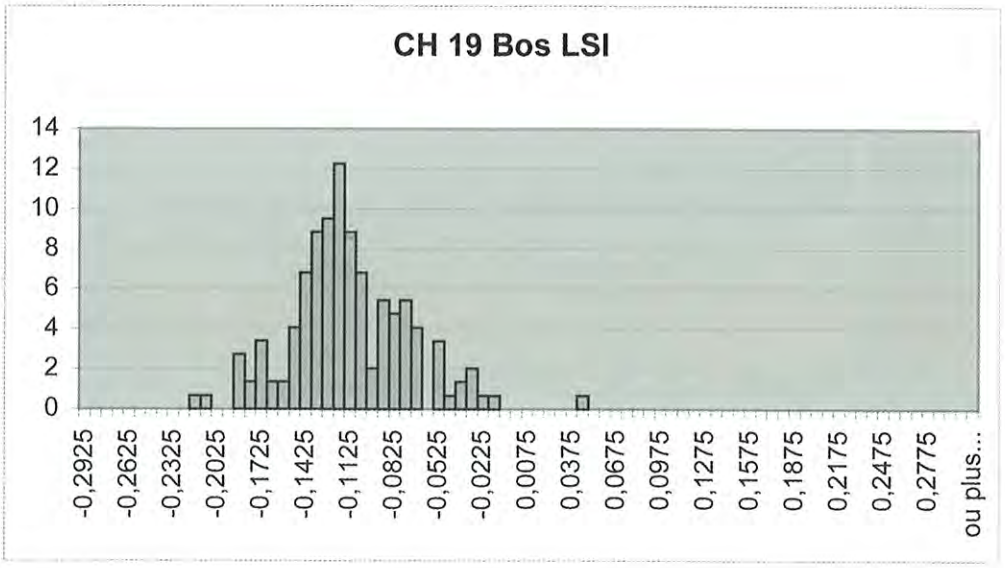

FIGURE 7
Measurements distribution of cattle at Chalain 19. Logarithm Size Index (reference measurements: *Bos primigenius* after Steppan, 2001).

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