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## Contribution of archaeozoology and archaeobotany to a multi-agent system mimicking the LBK society (Central Europe, 6th-early 5th millennia cal.BC)

Stéphanie Bréhard, Aurélie Salavert, Mehdi Saqalli, R. Bendrey, Jean-Pierre Bocquet-Appel, Jean-Denis Vigne, Anne Tresset

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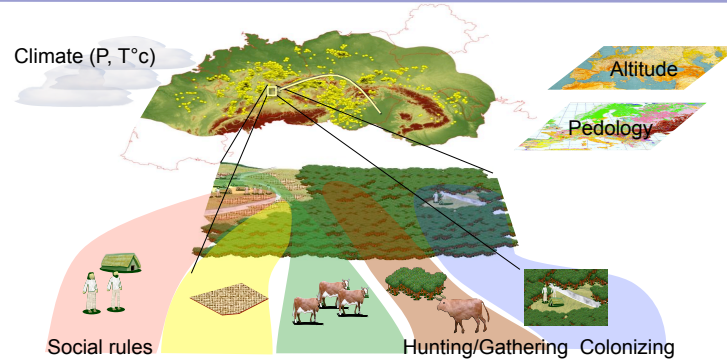
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# Contribution of archaeozoology and archaeobotany to a multi-agent system mimicking the LBK society (Central Europe, 6th- early 5th millennia cal. BC)



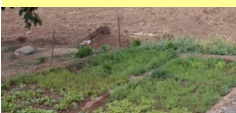
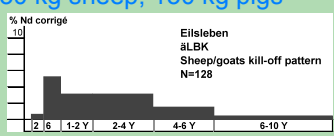
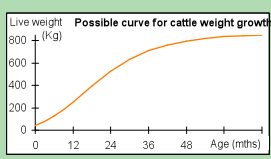
S. BRÉHARD<sup>1</sup>, A. SALAVERT<sup>1</sup>, M. SAQALLI<sup>2</sup>, R. BENDREY<sup>1</sup>, J.-P. BOCQUET APPEL<sup>3</sup>, J.-D. VIGNE<sup>1</sup>, A. TRESSET<sup>1</sup>



The aim of this poster is to describe the contribution of bioarchaeology to the construction of the OBRESOC MAS. The hypotheses produced by this MAS will be eventually confronted with independent bioarchaeological observations.

## AGRICULTURE

## HUSBANDRY

<p>archaeological data (e. g.: Bakels 1978, 1999; Kreuz 1990, 2007; Knörzner 1997; Blenek 2002; Salavert 2011)</p>	<ul style="list-style-type: none"> <li>• Emmer/Einkorn</li> <li>• Pea/Lentils</li> <li>• Flax/Poppy</li> </ul>	<h3>SPECIES</h3>	<ul style="list-style-type: none"> <li>• Cattle</li> <li>• Sheep/goats</li> <li>• Pigs</li> </ul>	<p>archaeological data (Arbogast et al. 2001; Schmitzberger, 2006; Kovackova, 2011; unpubl. databasis)</p>
	<ul style="list-style-type: none"> <li>• Reproduction characteristics</li> <li>• Sowing seasons, maturation span &amp; harvest season</li> <li>• Max. yield (weight/cultivated unit)</li> <li>• Growth speed</li> </ul>	<h3>ETHO-PHYSIOLOGICAL CONSTRAINTS</h3>	<ul style="list-style-type: none"> <li>• Natural mortality</li> <li>• Age at first parturition</li> <li>• Calving/lambing rates</li> <li>• Litter size</li> <li>• Breeding life</li> <li>• Life span</li> <li>• Birth season</li> <li>• Duration of lactation</li> <li>• Weaning age</li> <li>• Amounts of milk</li> <li>• Animal weight &amp; growth speed</li> </ul>	<ul style="list-style-type: none"> <li>- feral populations</li> <li>- traditional farming (Africa, Middle-East)</li> <li>- primitive breeds (Western Europe)</li> <li>- extensive range management (Europe)</li> </ul> <p>(e.g. Pennetier, 1893; Quillet &amp; Denis, 1963; Quillet &amp; Zert, 1971; Dahl &amp; Hjort, 1976; Jociński, 1977; Molteni &amp; Casabianca, 1979; Digard, 1981; Wapenaar et al., 1986; Lecomte et Le Neveu, 1986; Jensen, 1986; Hall &amp; Hall, 1988; Lecrovin &amp; Jansau, 1988; Boudoire &amp; Vassant, 1989; Bertheaux &amp; Micot, 1992; Amador, 1995; Berger et al., 1997; Frutinski &amp; Labudzki, 2002; Otte &amp; Chlonda, 2002; Clutton-Brock &amp; Pemberton, 2004; Halstead &amp; Isakidou, 2011)</p>
<ul style="list-style-type: none"> <li>- archaeological data (Bogaard 2004)</li> <li>- experimentation</li> <li>- agronomy</li> </ul>	<ul style="list-style-type: none"> <li>• Fields created from slashing &amp; burning forests</li> <li>• Permanent small fields &amp; Gardens: "garden cultivation"</li> </ul>	<h3>SCALE ENVIRONMENT ANIMAL FEEDING</h3>	<ul style="list-style-type: none"> <li>• Herd management: village/micro-regional scale</li> <li>0.5 cattle/individual (0.8 head/ind.)</li> <li>• Ruminants: meadow/forest pastures &amp; leaf foddering in forest</li> <li>• Pigs: household refuse &amp; acorns</li> </ul>	<p>(Ebersbach &amp; Schade 2004; Gregg 1988)</p>
<ul style="list-style-type: none"> <li>- archaeological data (Bogaard 2004; Bogaard, Jones 2007; Bakels 2009)</li> <li>- agronomy</li> <li>- ethnology</li> </ul>	<ul style="list-style-type: none"> <li>• High labour input</li> <li>• Plant processing outside village</li> <li>• Significance importance of manure</li> <li>• Winter/spring sowing (cereals)</li> <li>• Mixed cropping (cereals/pulse)</li> </ul>	<h3>PRACTICES Agronomy Zootechnics</h3>	<ul style="list-style-type: none"> <li>• Cattle slaughtered btw 1-4 yrs (priority)</li> <li>• Sheep: 6 mths-2 yrs &amp; 2-6 yrs</li> <li>• Males preferably slaughtered</li> <li>• 850 kg max. cattle; 30 kg sheep; 130 kg pigs</li> </ul>	<p>archaeological data (Ménier, 1984; Arbogast, 1994; Hachem, 1995; Tresset, 1996; Kovackova, 2011; Bréhard, unpubl.)</p> 
<p>archaeological data</p>	<ul style="list-style-type: none"> <li>• Seeds</li> <li>• Oil?</li> <li>• Straw?</li> <li>• Fibres?</li> <li>- peas: 15 cwt/ha; lens: 11.5 cwt/ha</li> <li>- flax: 140 kg/ha</li> </ul>	<h3>PRODUCTS/ BY-PRODUCTS</h3>	<ul style="list-style-type: none"> <li>• Meat</li> <li>• Milk/dairy products (cow; ewe; goat?)</li> <li>• Hair?</li> <li>- meat and offal weight/age at death</li> <li>- milk: 1.5 kg/milking cow/day; 0.3 kg/milking ewe/day</li> </ul>	<p>archaeological data (Hachem, 1995; Tresset, 1996; Bréhard et al., 2010; Kovackova, 2011; Bréhard, unpubl.)</p> 

1 - CNRS-Muséum national d'Histoire naturelle (UMR 7209 Archéozoologie, archéobotanique : sociétés, pratiques et environnements), CP 56, 55 rue Buffon, F-75231 Paris cedex 05, France  
 2 - CNRS-Université Toulouse le Mirail (UMR 5602 GEODE), Maison de la Recherche, 5 Allées Antonio Machado, 31058 Toulouse, France  
 3 - CNRS-EPHE (UPR2147), 44 rue de l'Amiral Mouchez, 75014 Paris, France