BIOGEOGRAPHICAL HISTORY OF RABBIT SINCE THE LAST GLACIATION : NEW DATA

CALLOU C., VACHOT A.M., MOUNOLOU J.C.

Laboratoire d'Anatomie Comparée, Muséum National d'Histoire Naturelle, 55 rue Buffon, 75005 Paris, France

Abstract - The first palaeontological records of rabbits (*Oryctolagus cuniculus*) were in Spain and the south of France. From these areas, the geographic distribution of this species has increased because of environmental factors and man. From the Pleistocene to the Neolithic, fluctuations of the species are tightly linked to those of climate and vegetation. Rabbits reach the North of France but do not cross the Loire. If this distribution is the same as on the continent from the Bronze Age to end of Antiquity, the animal was introduced in some Mediterranean islands (Balearic Islands and Zembra). From the beginning of the Middle Ages, man is the principal agent of dispersal : introduction first in Northern Europe and then in other parts of the World.

INTRODUCTION

If the modern distribution of the rabbit (*Oryctolagus cuniculus*) is well known by works of FLUX (1994), FLUX and FULLAGAR (1992), and GIBB (1990), the setting of this one was imprecise. The first palaeontological records, dated about 6 million years were found in Andalousia (LOPEZ-MARTINEZ, 1989). It seemed to be very interesting to study the evolution of the geographic distribution of this species for a better understanding of the respective roles of biological evolution and human activities on processes.
A first approach has permitted to outline the evolution (CALLOU, 1995) but it has appeared very soon that these results were not complete enough, some sites being not represented. The different maps obtained will be compared with ones realized by studies of ancient bones mtDNA (HARDY *et al.*, 1995).

MATERIAL AND METHODS

Palaeontological and archaeozoological publications have permitted the creation of the successive distribution maps. The main problem is the burrowing behaviour of the rabbit and to run the risk to find recent bones in archaeological levels.
It's the reason why we have to examine the results critically and take archaeological data into consideration.
Some sites do not kept because :

- only one bone was collected
- the distinction between *Oryctolagus* and *Lepus* was not sure
- the archaeozoological study concern only micromammals or macromammals

We have pointed out sites in which rabbit bones are found and those in which bones are missing. But the fact that we have not mean that rabbit is completely absent of the area. So, this research require a very complete database.

RESULTS AND DISCUSSION

From the Upper Palaeolithic to the Neolithic (Map 1), fluctuations of the species are tightly linked to those of climate and vegetation. Rabbits leave the Iberic Peninsula and reach the North of France but do not cross the Loire. It's very interesting to observe that any bones are collected in Italia and in the north of Navarra (Spain).

With the roman conquest, we can suppose that man transfer the species in an other area but in facts the distribution is the same as on the continent from the Bronze Age to end of Antiquity (Map 2). In the same time the animal was introduced in some Mediterranean islands (Balearic Islands and Zembra) but not in Corsica and Sicily.

From the beginning of the Middle Ages (Map 3), man is the principal agent of dispersal. The species is imported in Northern Europe : IX century in Nièvre, XII in Great Britain, and Belgium, XV in Germany and XVI in Hungary. However, the animal is not still domestic but rather "domestic-wild" by kept in warren.

This process intensifies (Map 4) because of introduction of rabbits in many islands and some countries.

The domestication problem is directly linked to the biogeographical history because in the both cases, it is dependent from the human choice. Now we have a good estimation of the general processes but we have to go further into the matter : for example, what population is the origin of domestic breeds. This approach is possible owing to results obtained by our colleagues and studying ancient rabbit skeletons.

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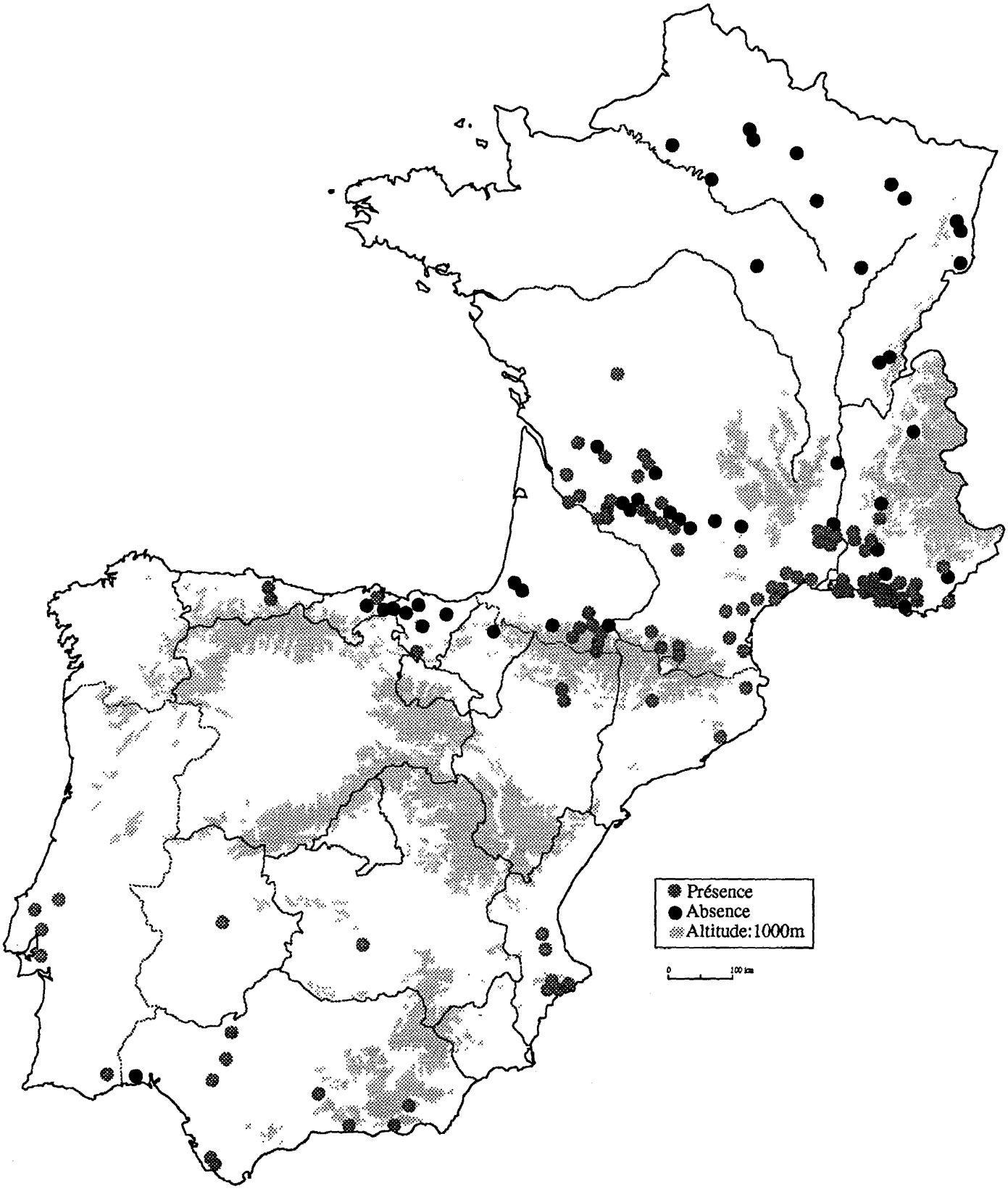
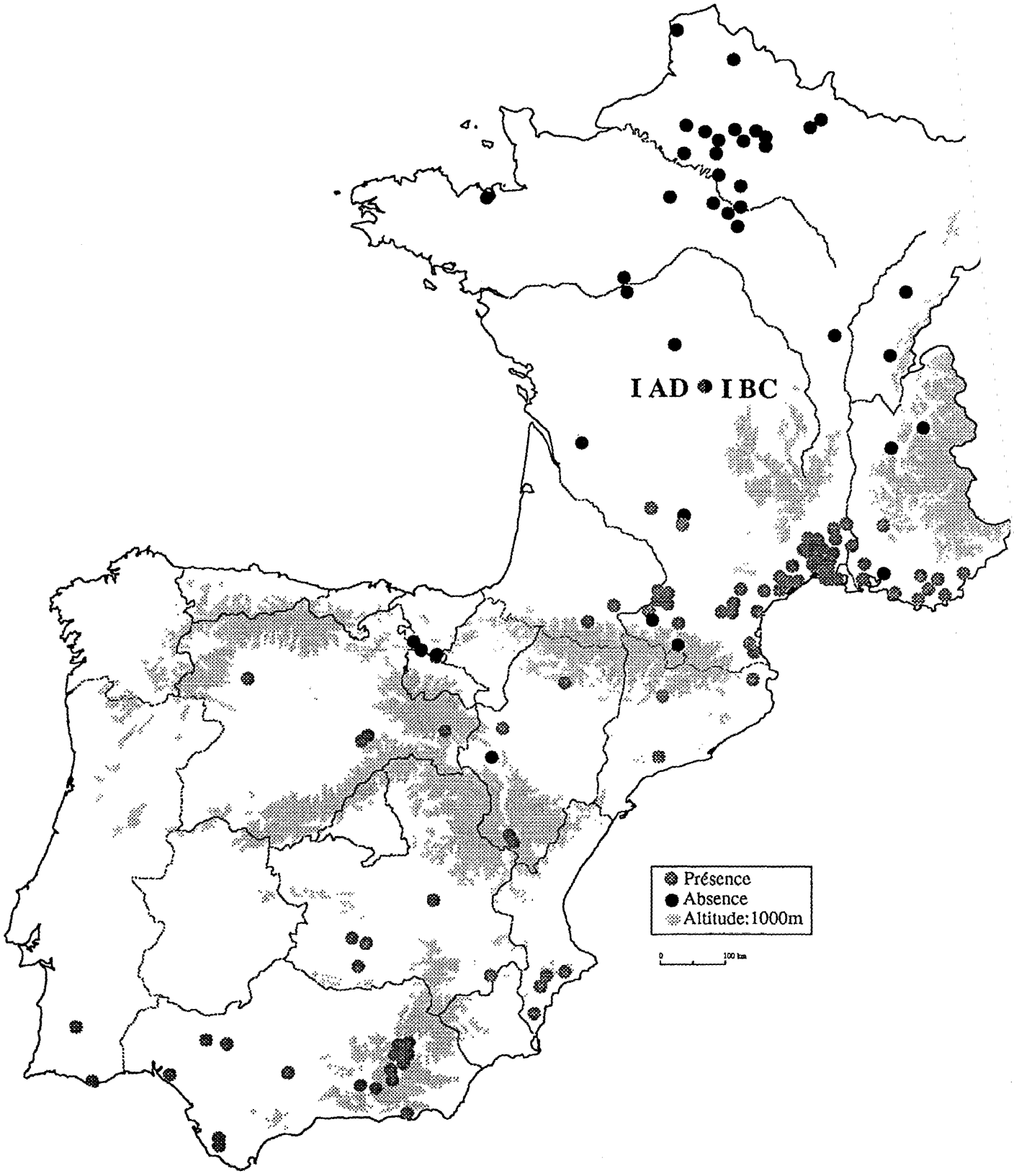
Histoire biogéographique du lapin depuis la dernière glaciation : nouvelles données - A partir de la Péninsule Ibérique et du midi de la France, le lapin (*Oryctolagus cuniculus*) a conquis de nombreux territoires par une diffusion naturelle liée à des facteurs environnementaux dans un premier temps puis par l'action de l'homme. La répartition actuelle de l'espèce est l'aboutissement de cette conquête qui s'est déroulée en 3 grandes étapes. Du Paléolithique supérieur au Néolithique les fluctuations sont étroitements liées à celles du climat et de la végétation, le lapin progresse vers le Nord sans franchir la Loire. Cette répartition reste la même sur le continent de l'âge du Bronze au Vè siècle mais l'espèce est introduite dans certaines îles méditérranéennes. A partir du Moyen Age, l'Homme est le principal vecteur de diffusion, dans le Nord de l'Europe puis dans de nombreuses îles et territoires à travers le monde.

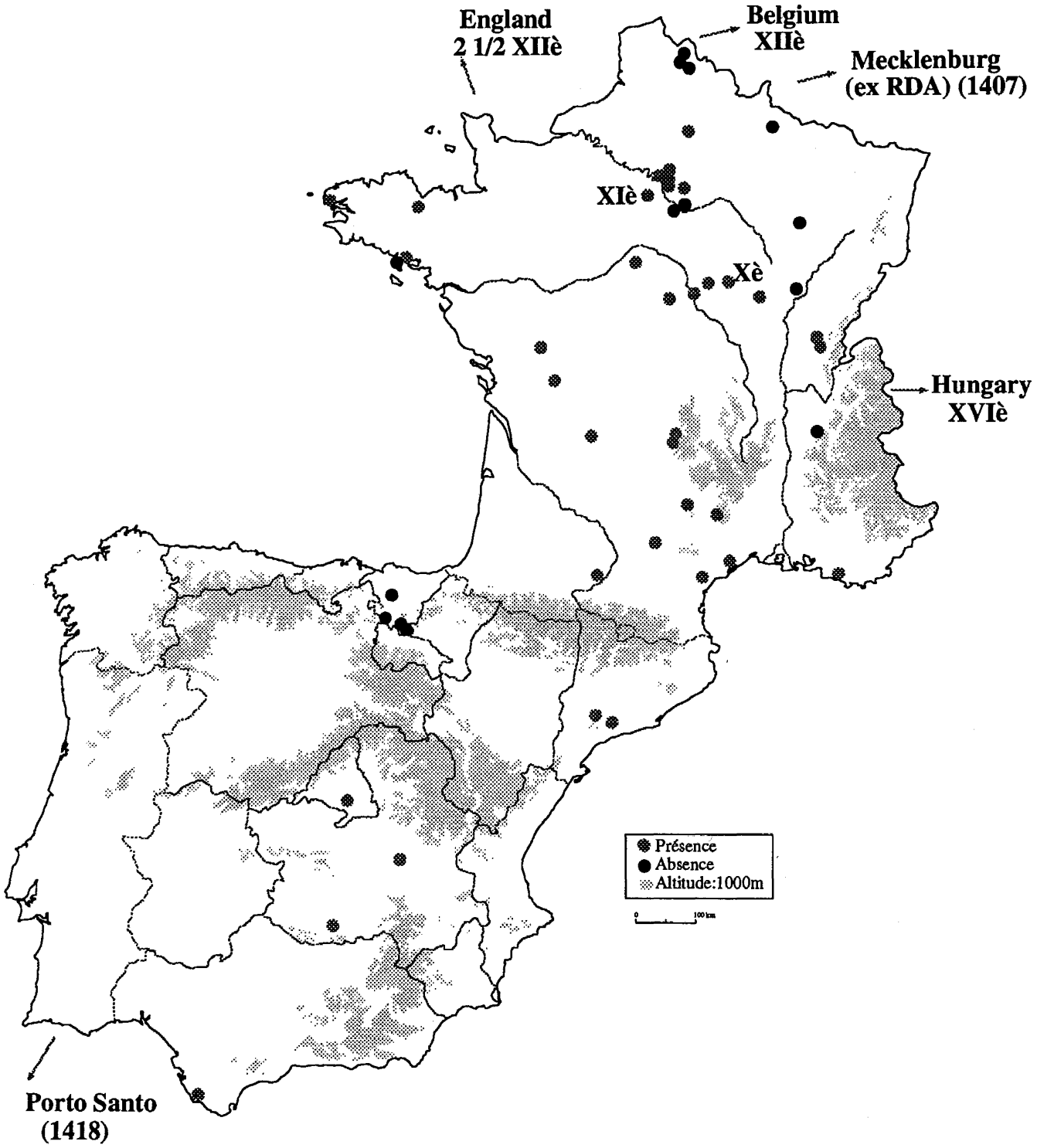
Map 1 : From Upper Palaeolithic to Neolithic



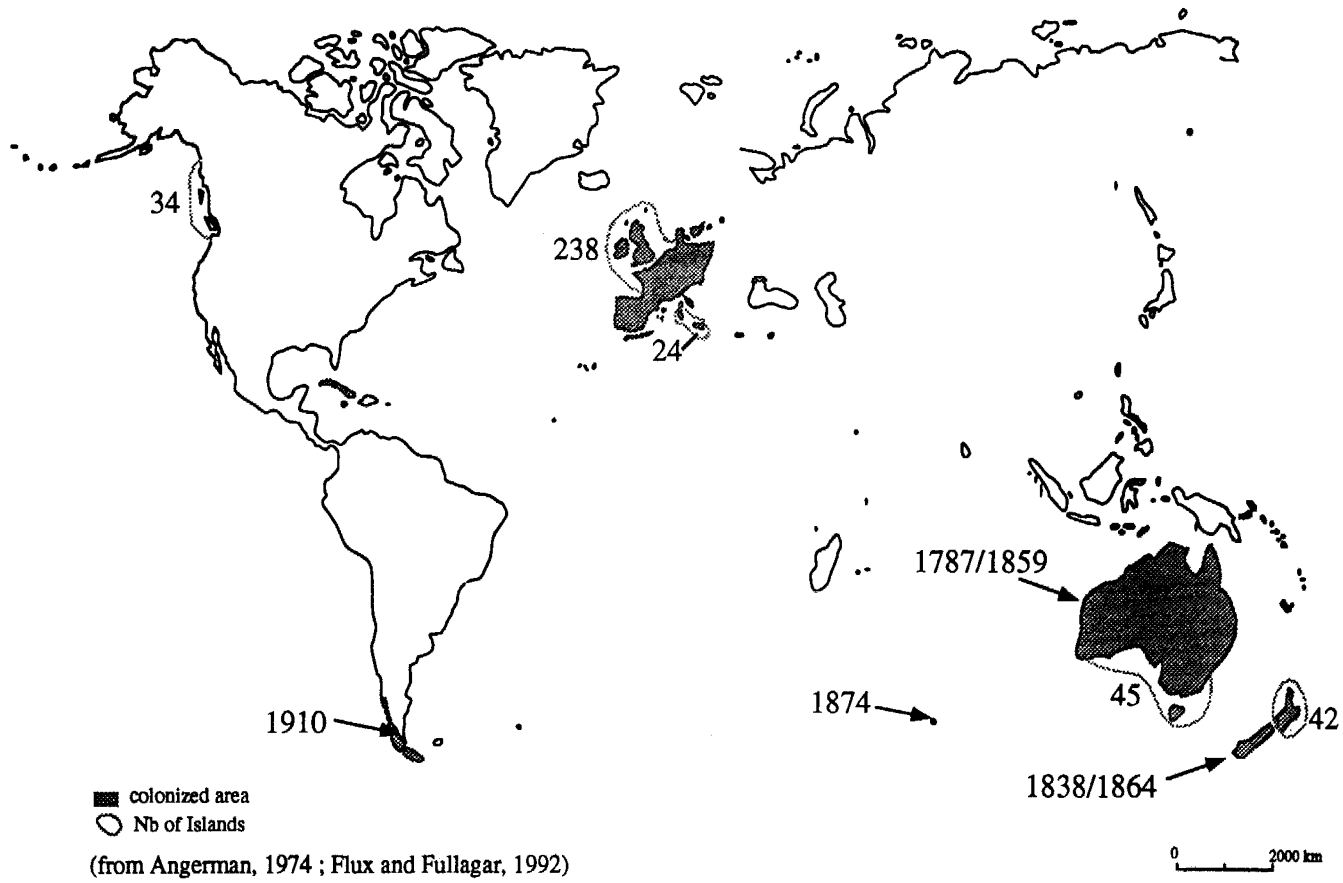
Map 2 : From Bronze Age to end of Antiquity



Map 3 : From early Medieval to post Medieval period



Map 4



(from Angerman, 1974 ; Flux and Fullagar, 1992)