Introduction

Amazonia, the world’s largest area of tropical forest, has ever since the initial steps of European colonization been viewed as a landscape difficult to master. Known as “The Green Hell”, the area has been seen as an inhospitable place for human colonization and as a consequence of the demographic collapse caused by the colonizing nations, the demographic situation seemed to match a picture of sparse ecological circumstances. Low population density as a consequence of ecological limitations (poor soils and lack of substantial protein resources) was a picture that was applied also to the prehistoric societies of the region. This picture of Amazonia as a region characterized by small-scale, non-hierarchical societies was strengthened by the fact that the traditional material culture of the region to a large extent was based on organic materials which rapidly decompose in the moist climate, leaving little traces for today’s archaeologists to find. Taken together, Amazonia’s prehistoric and present native cultures have been studied from a perspective of environmental determinism, where supposedly sparse ecological circumstances have been seen as a limiting factor when it comes to cultural development.

Amazonia is home to the largest linguistic diversity of the world; approximately 500, or almost 10 percent of the world’s known languages belong to this region. These 500 different languages are divided between about 50 language families (see fig. 1). To get some perspective of this diversity it ought to be pointed out that for example in Europe, the Indo-European language family is strongly dominant, and in western Europe the Roman languages of the Indo-European stock are totally dominant. In Amazonia, a strong connection has been found between ethnic groups and language. This connection is expressed in the concept of “ethno-linguistic” groups, which I will use throughout the thesis. The ethno-linguistic entities of Amazonia have traditionally been viewed as biologically defined populations that interacted with each other through physical migrations; much like the balls of a pool table, the different ethno-linguistic populations were believed to have expanded simply through physical movement in the terrain. The complex linguistic maps of the multitude of linguistic groups in Amazonia give an impression of enormous complexity, but they offer no clues to the processes behind this
diversification. Instead, the maps offer a static view that provides very little information concerning linguistic development, inter-ethnic relations, ethnogenesis, and different forms of exchange relations within and between ethno-linguistic groups.

Fig. 1. Linguistic families in South America

(Linguistic families in South America (Adapted from Nimuendaju 1987))

The Thesis

The aim of my thesis is to create a more complex explanation of cultural and linguistic development in Amazonia. This will be accomplished by integrating anthropological theories of ethnicity, ethnogenesis, and inter-ethnic relations with data from academic disciplines such as history (fig 3), linguistics (fig 1 and 4), archaeology (fig 2), ethnography (3), geography, and ecology (fig 5). The integration between anthropological theory and the cross-disciplinary empirical material will be accomplished by using Geographical Information Systems (GIS) as a tool for mapping and analyzing the cultural and linguistic development through time and space. Since all the studied
parameters can be mapped onto specific places and time periods, a geographical mapping of the time-space correlations of these datasets is possible. By creating a large-scale GIS-database, containing data for approximately 2000 BC – AD 1700 from all the scientific fields listed above, the empirical basis for the thesis will be unprecedented by any other synthesis of cultural and linguistic development in the region.

![Fig. 2. Mapped archaeological sites in Amazonia](image1)

![Fig. 3. Dated and positioned ethno-linguistic groups from historical sources.](image2)

Although the scientific focus will be to integrate anthropological theory with the empirical material, rather than to collect empirical material, the strong empirical basis will serve as a precondition for a successful scientific entry into an area where acceptance of new research traditionally is strongly dependant on the empirical background of the research.

More specifically, the project aims to examine how Arawak, a language family characterized by specialized agricultural societies living along the nutrient-rich varzea areas of the major rivers and the wet savanna areas (llanos) over a large area of South America and the Caribbean (fig. 4), could have functioned as a cultural barrier between the other language families and thus contributed to the linguistic diversification of the continent.
By adopting the concept of “ethnic circumscription” (fig. 4), I intend to show how Arawak-speaking peoples have contributed to the ethnic circumscription of other linguistic groups, and how this process has led to the linguistic diversification of the continent. The strong emphasis on anthropological theory in this hypothesis will stand in sharp contrast to the traditional view of linguistic diversification in South America, where the focus has been on migration, subsistence technology, and geographic isolation.

One of the most difficult aspects of the work in this thesis is the connection between specific archaeological features and Arawak-speaking peoples. This may actually seem like an impossible task at first glance, but there are examples from historical cases where material culture has been matched with specific ethno-linguistic groups, and attempts do this with prehistorical material have also been made. First, it needs to be pointed out that the Arawak had specific features in their ethno-linguistic identity that have left traces identifiable to the scientific fields listed above. As mentioned above, Arawak is the language family of the New World with the largest spatial extent; when Europeans “discovered” the New World, Arawak-speaking people were found from the Island of Cuba in the north all the way down to Paraguay in the south. The Europeans quickly realized that the Arawaks were extensive traders along the major waterways, and when European trade goods were put into circulation, Arawak-speaking groups quickly adopted the European goods and started to use the new prestigious items in their already established trade networks. By adopting the trade with the Europeans, Arawak-speaking groups were able to strengthen their strategic position along the major rivers against other

Fig. 4. Main linguistic families, and linguistic groups circumscribed by Arawak
indigenous groups with whom they had been competing over land and other resources since the time before European colonization.

Like the Arawakan trade networks, their subsistence was also based on the major rivers. Arawak-speaking people farmed the nutrient-rich areas of *varzea* (annually flooded river banks) of the major rivers all over Amazonia. In places where no major rivers existed, so-called raised fields (*camellones*) are known to occur. These raised fields are known from the Caribbean Islands and Venezuela in the north to Bolivia in the south, and they are known to occur in areas traditionally inhabited by Arawak-speaking populations. The major crop used seems to have been manioc (a starchy tuber plant), but at some point, at least in some areas, maize seems to have been favored. One of the objectives of the thesis is to investigate the emergence and distribution of maize in relation to manioc over time. Since both of these agricultural systems have left traces for today’s archaeologists to discover, they form one of the most important materials for the study. This is one of the areas of the thesis in which the “hard sciences” such as geography and soil science will make a great contribution. Without them, I would risk looking for traces of subsistence technology in the wrong places (fig. 5).

Another important source of information concerning agricultural activities is archaeological artifacts. One of the most important sources of information in this case is manioc...
graters (used in the preparation of bitter manioc), which can be connected to subsistence technology and matched with other types of data (raised fields, terra preta soils [see description below], geography etc.).

The distribution of anthropogenic black soils, locally known as Terra Preta or Terra Preta do Índio, is another data source with great potential. Known to occur over very large areas along the major rivers of the Amazon area, terras pretas form evidence of prehistoric human settlements with great extent in space and time. Although researchers already in the 19th century were aware of the existence of these black soils, their potential as evidence for large-scale human settlements along the major rivers has not been widely accepted until quite recently. Mapping of terra preta and correlating their extent with the other data sources will form an important part of the thesis.

Ceramics is also a data source with great potential. Many previous authors have been trying to match ceramic styles with ethno-linguistic groups in Amazonia without reaching complete success. The problem, as I view it, has been that these authors have not used enough empirical material from other scientific fields than archaeology to strengthen their cases. It is important to remember that none of the data sources that I have listed here will in itself form sufficient evidence of the presence of Arawak-speakers. The idea is to put as many of them as possible together, thereby forming a robust empirical basis where the different scientific fields complement each other and together with a solid theoretical framework strengthen the conclusions of the thesis.

Since the seminal work of anthropologist Fredrik Barth on ethnicity, ethnogenesis and inter-ethnic relations, anthropologists have acknowledged how ethno-linguistic differentiation can be generated out of social interaction between populations occupying separate ecological niches, which often coincide with distinct ecological zones. An hypothesis for this project is that this model may be applied to the Arawakan language family, on one hand, and the language families of Pano, Tupí, Carib, and Gê, on the other. This hypothesis is possible to suggest due to the fact that the latter four seem to have crystallized in higher terrain, away from the major rivers and the wet savanna areas.
(which is not the case with Arawak). Not least in relation to the proposed relationship between Tupí, Carib and Gê – the main linguistic entities of the eastern part of Amazonia – it would be interesting to investigate what role the expansion of the Arawakan languages around 1000 BC – AD 500 might have played in the process that led to their diversification. The main block of Carib-speakers in the highlands of Guyana seems to have been surrounded by Arawak-speakers on all sides (fig. 4). If it can be shown that Arawak-speakers occupied the riverbanks of the lower Amazon (especially the northern bank), it could also be postulated that they formed an ethnic boundary between Carib and Tupí. Another interesting aspect is that the Pano-speakers of Western Amazonia, like the Carib-speakers of Guyana, were circumscribed by Arawak speakers on all sides (fig 4).

To sustain the thesis hypothesis of “ethnic circumscription” by riverine Arawak-speakers as an explanation of the linguistic diversification in Amazonia, various kinds of evidence from disciplines such as linguistics, history, archaeology, ethnography, geography, and anthropology are required.

The boundary between Tupí and Gê may at one time have been aligned with the Xingú River (fig 6). This boundary may simply have been generated by the socio-ecological distinction between rainforest and dry savanna, in accordance with Barth’s model, but an early presence of Arawaks along the Xingú – circumscribing the Tupí on all sides – should not be ruled out. The possible application of the concept of socio-ecological distinctions to ethno-linguistic groups in Amazonia will also be tested in the thesis. There is strong evidence for a socio-ecological distinction between Tupí and Gê in the eastern part of their area of distribution, but the picture seems somewhat more complex along
the Xingú, mostly due to the presence of other ethno-linguistic groups, such as Arawak, which further complicates the situation.

Conclusion

The thesis aims at creating a large-scale GIS database covering Amazonian prehistory between 2000 BC and AD 1700 in order to be able to test the hypothesis of ethnic circumscription described above. This database will be compiled of geographically positioned material from archaeology (datings, ceramic styles, tempering materials, rock art, anthropogenic soils, and other visual aspects of material culture); historical linguistics (linguistic distribution maps); ethnography (historical material culture with analogies to prehistory, trade routes, and the spatial extent of indigenous groups); and geography and ecology (mapping of soil types, vegetation zones, climate changes, and water flows).

As a complement to the major hypothesis, a number of other questions will also be asked:

- How can we, with the assistance of linguistic, archaeological, ethnographical, and geographical material, understand the formation of the border between Tupí and Gê in Eastern Brazil? In what ways are their areas of extension correlated with ecological variation in the region?

- What kinds of continuities between ethnographical and archaeological material exist in Amazonia, and how can we use these possible continuities to extend our knowledge of the prehistoric societies of the region?

- In what ways can material from historical linguistics, archaeology, and geography help us to understand the possible connections between language families, material culture, and ecological niches?
• How can GIS be used to extend our scientific knowledge of cultural and linguistic development, population density, and social stratification in Amazonian prehistory?

A more general question of the thesis is:

• How can social science, humanistic science, and natural science become integrated in a project, and what benefits can be drawn from this integration with regards to our knowledge of Amazonian prehistory?

Fulfilling this project requires a great deal of trans-disciplinary work. Therefore, as a complement to my supervisor Alf Hornborg, a complementary supervisor, Andreas Persson, a physical geographer from the GIS-centre at Lund University, has been appointed. Together with my own knowledge of archaeology, human ecology, and to a certain extent also GIS, Alf Hornborg, with his expertise in Amazonian indigenous cultures, and Andreas Persson, with his expertise in GIS and geography, will make it possible to fulfill the project plan described above. Hopefully, this trans-disciplinary approach will also contribute to answering the final question posed above.