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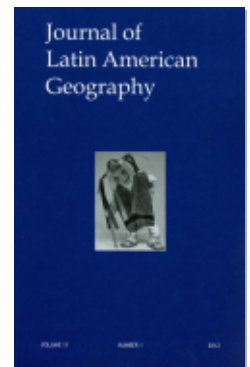
Rewriting the Late Pre-European History of Amazonia

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Rewriting the Late Pre-European History of Amazonia

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Abstract

The conventional understanding of pre-European Amazonian people has been that of simple peoples living in small autonomous villages, sparse populations that survived though foraging and shifting cultivation with minimal environmental impact. In recent decades a New Model or synthesis has been developing that includes complex regional societies, locally dense populations, intensive cultivation, fertile anthropogenic soils, and considerable environmental modification.

Keywords: *chiefdoms, human impacts, New Model, population, pre-European Amazonia, terra preta*

Resumo

O entendimento convencional dos povos Amazônicos pré-Europeus tem sido um de populações simples e esparsas, congregadas em pequenas vilas autônomas, que sobreviveram de forragem e cultura itinerante, e com mínimo impacto ambiental. Nas últimas décadas um Novo Modelo ou síntese tem sido desenvolvido que destaca sociedades regionais complexas, populações locais densas, cultura intensiva, férteis solos antropogênicos e modificação ambiental considerável.

Palavras-chave: *chefias, impactos humanos, Novo Modelo, população, Amazônia pré-Européia, terra preta*

Resumen

El acercamiento convencional a las poblaciones amazónicas pre-europeas ha sido el de gente simple que vive en pequeños villorios autónomos, poblaciones dispersas que sobrevivieron a través del forraje y cultivos no permanentes con impacto ambiental mínimo. En décadas recientes, un Nuevo Modelo o síntesis ha ido desarrollándose e incluye sociedades regionales complejas, poblaciones localmente densas, cultivo intensivos, suelos antropogénicos fértiles y modificaciones ambientales de consideración.

Palabras clave: *cacicazgos, impactos humanos, Nuevo Modelo, población, Amazonia pre-europea, terra preta*

“The population density and level of cultural complexity achieved by protohistoric Amazonians is one of the most controversial topics in American archaeology” (Meggers 1963-1965: 91).

The “new image of Amazonia [is of] an originally populous area – with an ecology significantly changed by human intervention – and [in places being] sociopolitically complex” (Viveiros de Castro 1996: 193).

Introduction: The Standard Model

The public and academic view of pre-European Amazonian societies was, until recently, one of low numbers, small frequently moving autonomous villages, lack of socio-political complexity, either foraging or simple shifting cultivation economies, and minimal environmental impact ("Standard Model," Viveiros de Castro 1996, Eriksen 2011: 4; "Standard Paradigm," Stahl 2002; "Tropical Forest" culture type, Steward 1949). This reflected meager archaeology¹ and assumptions based on historical or still surviving indigenous groups. In 1916, the Swedish anthropologist Erland Nordenskiöld (2009) reported old earthworks in the Mojos savannas in Bolivian Amazonia, but little attention was given, and elaborate polychrome ceramics were long known on Marajó Island but were little studied. Sixteenth-century accounts from the Orellana (Carvajal 1934) and the Ursúa/Aguirre (Mampel González and Escandel Tur 1981) expeditions describing large villages and numerous people along the Amazon River were considered fantasies or exaggerations (Meggers 1963-1965).

Steward, Meggers, and Willey

In the *Handbook of South American Indians*, editor Julian Steward (1949) concluded that a class-structured society was "not characteristic of the Tropical Forest tribes" (p. 760). "But each village was independent ... rarely permanent;" cultivation was shifting as result of "soil exhaustion" which "required" that villages be shifted (pp. 697-699).

Archaeologist Betty Meggers did her dissertation field work in 1948-1949 on Marajó Island, and in the resulting monograph with Clifford Evans (1957) she argued that the complex society they found could not have developed there because of the tropical environment and instead had arrived intact from the Andes and then collapsed. In a 1957 article she argued her deterministic theory that, because of "limited agricultural potential" (climate, infertile soils), complex societies were impossible in pre-European upland Amazonia. At age 90, long renowned at the Smithsonian Institution, she still persists with this thinking, and she is an influential person (Meggers 1996: 169-173, 2001, 2003a, 2003b, 2004, 2010: xiii-xvii, 177-181).² She explains apparent evidence for large permanent villages as indicative of reoccupation – small migrating villages coming back to previous sites over and over (Meggers 2001).

In 1957 in a Pan American Union anthropology symposium in Puerto Rico, geographer James Blaut (1959), in a paper on "The Ecology of Tropical Farming Systems," criticized Meggers for maintaining that shifting cultivation was the optimum form of agriculture by native people in Amazonia. Meggers (1959), a discussant for Blaut's paper, objected and commented: "may I say to the geographers [James Parsons, Raymond Crist, and David Lowenthal were also present]: Do not sell your birthright short" (p. 99). She meant environmental determinism. In retrospect, Blaut was right. Meggers was and remains wrong.

In 1967 Meggers wrote me: "I am disappointed to see you follow the same arguments that obscure the relationship between environmental potential and cultural development." And many years later in 2010 she wrote William Woods that she had provided detailed data showing that *terra preta* soils (fertile anthropogenic dark earths) were "the result of [repeated] short-term occupations [also see Meggers 2004] ... I am surprised that you [meaning Woods] ignore these data since you are a geographer." So Meggers has long been at war not only with fellow archaeologists but also with geographers.

In 1971 distinguished Harvard archaeologist Gordon R. Willey in his classic text on *American Archaeology* wrote that the “Tropical Forest Culture ... was based on the slash-and-burn cultivation of manioc. Communities tended to be small and were frequently shifted; the socio-political unit was usually the single community; and political authority was weakly developed” (p. 399).

Lathrap, Denevan, and Erickson

I initially got to Amazonia in 1956 writing articles for the *Peruvian Times*. Earlier, in 1952, I had taken an undergraduate class at Berkeley from Carl Sauer on “The Geography of South America,” but he spent little time on Amazonia, so I didn’t know much about the region (I still have my class notes). The *Peruvian Times* editor, C. N. Griffis who had edited the magazine back in 1913, gave me assignments that included parts of Amazonia in Peru, Bolivia, and Brazil – experiences which changed my life, and which led to meeting archaeologist Donald Lathrap, who was soon to issue the first major challenge to the conventional model of simple pre-European Amazonian people. As an undergraduate at Berkeley, he was strongly influenced by Carl Sauer.

First, I was sent over the Andes to Pucallpa on the Río Ucayali at the end of the Trans-Andean Highway. While there I visited the near-by Shipibo village of Yarinacocha. I was struck by the village being on the bluff rather than in the Ucayali floodplain, a situation I returned to 40 years later (Denevan 1996). In the plaza was a recently dug rectangular trench, and I was told that it was made by Lathrap, who it turned out was doing Harvard dissertation research (1962). I met him in Pucallpa, and we remained in contact until his death in 1990.

Lathrap (1970; see Oliver 1992) argued that native populations were larger than previously realized; that complex societies with permanent villages developed within the Amazon Basin; that agriculture was early in Amazonia and initially was not shifting but permanent in the form of large gardens; that *várzea* (floodplain) soils were far superior to *terra firme* (upland or interfluvial) soils; and that protein availability was critical in determining settlement size and location.

On that visit to Yarinacocha I took numerous color photos. Looking at them recently, I saw that the soils in the fields adjacent to the village, an ancient site, were black or dark brown, clearly terra preta (Figure 1). I did not make this observation then, and neither did Lathrap, nor did hardly any other researchers in Amazonia until much later.

In 1956 the *Peruvian Times* also sent me on a long voyage up the Amazon and Río Madeira from Belém to Pôrto Velho to Guayaramerin on the Río Mamoré on the Bolivian border. It was a journey that turned me into an Amazonianist, as I realized there were many exciting questions to be explored. From the border I flew over the flooded Mojos (Moxos) savannas and saw linear features standing out of the water and wondered about them. Later back in Berkeley, I read up on the region and learned from Alfred Métraux’s 1942 monograph on eastern Bolivia that these features were pre-European earthworks. This led to my dissertation. That published study (Denevan 1966), including ground and aerial photos, provided physical evidence of a past sophisticated society, large population, massive earth movement, drainage manipulation, and intensive cultivation in one corner of Amazonia – a place Clark Erickson (2006), a student of Lathrap’s, calls a “domesticated landscape.”

My work did not receive much attention until later, but Erickson’s (1995, 2006, 2010) subsequent years of field research and publication have made Mojos well known, and he has been a major contributor to revisionist interpretations of the Amazonian past.



Figure 1. Shipibo women in a new swidden field at the village of Yarinacocha near Pucallpa, Peru. The brown soil behind, and next to the black shadow is anthropogenic *terra preta*. (Photo: William Denevan, 1956)

The New Model of Pre-European Amazonia

Since Lathrap's work in Peru, other archaeologists have undertaken major projects in Amazonia on Marajó Island (Anna Roosevelt, Denise Schaan), in the Upper Rio Xingu region (Michael Heckenberger), along the Amazon near Manaus (Eduardo Neves), at Santarém (Roosevelt), and elsewhere, projects involving large sites and earthworks, projects supportive of a new interpretation of pre-Columbian Amazonia. The consensus now is that populations were much greater than previously believed; many villages were large and semi-permanent; complex societies existed with regional integration; cultivation was usually intensive or semi-intensive; fertile soils were created; and the natural environment was changed to varying extent by human activity ("new synthesis," Viveiros de Castro 1996, Whitehead 1996, Neves 1999, Roosevelt 1999a; "Revised Model" or "Revised Paradigm," Stahl 2002, Erickson 2003, Heckenberger *et al.* 2007, 2008). Peter Stahl (2002: 44) has argued that: "The revision of Standard Amazonian archaeology emphasizes: environmental heterogeneity, variability in agricultural adaptation, deeper time scales for human occupation, endogenous cultural complexity, and higher population density."

Meggers (2001, 2003a, 2003b, 2004; Popson 2003) has responded in defense of her positions: for example, "the myth [of El Dorado] is being revived by archaeologists, in the form of vivid descriptions of urban populations with powerful rulers" (2003a: 102); Heckenberger's "claim to 'present clear evidence' ... is anything but clear" (2003b); Stahl's "persistent rejection of independent evidence for ... limitations on sustainable carrying capacity ... is remarkable" (2004: 36); Roosevelt's "statements are not supported by existing archaeological evidence" (2003a: 96); contrary to Denevan and Erickson's

raised fields, “natural processes of biotic or abiotic origin ... produce regularly spaced mounds and ridges” (2003a: 97); William Woods’ populations are “just outrageous” (in Popson 2003: 30); “Amazonia is not an anthropogenic forest any more than it is a forest made by ... other animals” (*Ibid.*).

Complex Societies

In Amazonia we are referring to chiefdoms (or polities), these being socially stratified with strong leaders and with multiple villages, in contrast to egalitarian societies with independent single villages with little social stratification. Chiefdoms have been identified by archaeology and historical descriptions along the central Amazon–Manaus region (Neves and Petersen 2006: 302), along the lower Rio Tapajós – Santarém region (Roosevelt 1991: 101), on Marajó Island (Roosevelt 1991: 1-97; Schaen 2001: 111), and in west-central Brazil (Pärssinen *et al.* 2009: 1092), the Upper Xingu region (Heckenberger *et al.* 2008: 1217), the Guianas (Whitehead *et al.* 2010), Venezuelan savannas (Spencer 1998), eastern Ecuador (Salazar 2008: 263), and eastern Bolivia (Denevan 2001: 239), so they are not unique (Roosevelt 1999a; Heckenberger and Neves 2009: 255-258). Some have been known since the 1940s, and others continue to be identified. They occurred in a wide variety of environmental situations, and they are associated with relatively dense populations, permanent or semi-permanent cultivation, and soil improvement. The sociopolitical characteristics of complex Amazonian societies are discussed by Heckenberger (2003).

David Wilson (1999: 168-250) in his important book on *Indigenous South Americans* describes várzea chiefdoms but believes that terra firme chiefdoms did not exist because of environmental constraints. Meggers in her popular *Amazonia* text book in both the 1971 and 1996 editions (pp. 129, 135 in both), based on the early accounts, accepts “high chiefs” with authority over large stratified multi-communities along the Amazon River. However in the new “Epilogue” to the 1996 edition she “casts doubt on the accuracy of the early European descriptions of large sedentary populations along the floodplain” (p. 187).

The Várzea/Terra Firme Dichotomy

Steward, Meggers, Lathrap, Roosevelt, Wilson, and others have stated that the várzeas supported more sophisticated societies, in contrast to “marginal” societies (foragers, small shifting autonomous farm villages) in the uplands –an environmental/cultural dichotomy and casual relationship. This distinction is weak, however (Viveiros de Castro 1996: 186). Heckenberger *et al.* (2008) have found chiefdoms on terra firme in the Upper Xingu region. I have shown that most of the riverine villages were on terra firme bluffs, not within the floodplains (Denevan 1996; also see Lathrap 1970: 44; and Carneiro 1995: 57). Settlements and earthworks in Marajó, Mojos, coastal Guianas, and the Orinoco Llanos, contrary to Roosevelt’s (1991: 3) depiction as being on floodplains, are mostly in seasonally flooded savanna. Foragers, farming villages, and chiefdoms all can be found in terra firme forest, riverine bluff/várzea, and savanna. Also, bluffs with large villages along the major rivers alternated with bluffs with little or no settlement; location was determined in part by major channels impinging against bluffs (Denevan 1996).

I suggest that for both várzeas and terra firme the locations of villages and towns of the different categories of Amazonian social organization were mostly unrelated to soil variations (except for terra preta), and instead were determined largely by historical, social, and political developments and conflicts resulting in differential concentrations of population (also see Viveiros de Castro 1996: 187). This relates

to Robert Carneiro's (1970) concept of social circumscription in the origin of some chiefdoms and states. Of significance, terra preta occurs on most types of terra firme soils.

Population

Many years ago I presented a method for estimating average densities for different habitats/subsistence, arriving at a total of roughly five to six million for Greater Amazonia (Denevan 1976). More recently I rejected that method, recognizing that, rather than even spacing, patches of relatively dense populations, both interfluvial and riverine, existed within large regions of sparse populations (Denevan 2003). My numbers now seem too low given recent archaeology, domesticated landscapes, the extent of terra preta, and the greater acceptance of the early reports of large numbers along the rivers. Some current estimates range from eight to twenty million (Woods, Denevan, and Rebellato n.d.; Augusto Oyuela-Caycedo, pers. comm. 2011). A striking number, previously overlooked, comes from Father João Daniel *ca.* 1759: from the region of "the Rio Negro alone [there seem to have come] about 3 million Indian slaves, as we can see in the registration books" (Sá 2004: 174). No time frame is given but it is nevertheless impressive. Such numbers both support and help account for the presence of complex regional societies.

Cultivation

The belief that shifting cultivation was dominant is no longer acceptable. Stone axes are too inefficient for frequent forest clearing (Denevan 2001: 28-29, 116-119). Most fields probably began at tree-fall gaps or blow downs, and then were maintained by mulching, manuring, composting, and ash and charcoal from infield burning, with very short term cropping/fallow cycles. Fertile black and brown terra preta soils were thus created which retain their fertility to the present and are sought out by farmers. Raised fields are indicative of intensive cultivation in the seasonally flooded savannas of the Guianas coast (Rostain 2008a, 2008b; Whitehead *et al.* 2010), Bolivia, the Orinoco llanos, and elsewhere (Denevan 2001: 213-253). Soil improvement made permanent or semi-permanent cultivation possible and thus larger populations than otherwise. Methods of past intensive farming can be applied today (Figure 2), a different perspective on the potential of tropical lands from that of Meggers in 1957 (unchanged in 2010), and from that of many if not most Amazonianist soil scientists, agronomists, and economic developers.

Terra Preta (Amazonian Dark Earths)

A critical development in this new thinking is research on terra preta: the initial discovery which dates to the 1870s (Woods and Denevan 2008); the many soil analyses and interpretations which we now have (Glaser and Birk 2011); and the discoveries of this remarkable fertile soil's great extent, possibly totaling as much as 12-13,000 square kilometers by one estimate (Sombroek *et al.* 2003: 130) in the forested regions of the Amazonian countries. Individual sites cover from a hectare or less up to several hundred hectares (several square kilometers). Antoinette WinklerPrins and Steve Aldrich (2010) provide a GIS data base for over 500 sites. There has been an explosion of research on terra preta in the past 20 years by soil scientists, archaeologists, anthropologists, geographers, and agronomists. This has resulted in four recent collections of papers (Lehmann *et al.* 2003; Glaser and Woods 2004; Woods *et al.* 2009; Teixeira *et al.* 2009; see Balée 2010),³ dozens of journal articles, and various masters theses and doctoral dissertations, mainly in Brazil, the United States, and Germany. Several symposiums on

terra preta have been held in Brazil and also at the 2001 Conference of Latin Americanist Geographers Meeting in Benicassim in Spain. A key earlier article was by geographer Nigel Smith (1980), although initially it was mostly ignored.



Figure 2. Experimental raised fields, based on relic fields, constructed by the community of Bermeo, Beni, Bolivian Amazonia. William Denevan (right) and Clark Erickson (left) (Photo: Robert Langstroth, 1993).

These soils have significance not only for understanding pre-European people and for their importance for both natives and settlers today. Experiments are being carried out to understand and apply terra preta technology to both subsistence and modern farming, not only in the tropics but elsewhere, by adding charcoal (biochar) to soil to retain nutrients and moisture (Glaser 2007; Kawa and Oyuela-Caycedo 2008; Kern, Ruivo, and Frazão 2009). Results have been promising, however funding thus far has been limited.

Geoglyphs

Recently, hundreds of enormous embankments, ditches, and causeways termed “geoglyphs” have been discovered following deforestation for cattle in the Brazilian states of Acre, Amazonas, and Rondônia – circles, squares, and rectangles, with walls and deep ditches. Some of these features are several hundred meters in length or diameter. Their origins and functions are not clear, but certainly a large number of capable people moved a large amount of earth (Pärssinen, Schaan, and Ranzi 2009; Schaan, Ranzi, and Barbosa 2010). Erickson (2010) describes monumental ring ditches in Mojos in Bolivian Amazonia.

In addition to the geoglyphs, on the Brazilian coast of central Amapá eleven megalithic sites have been discovered which “consist of vertical granite slabs that are arranged in lines, circles, or triangles,” with probable ceremonial functions (Rostain 2008b: 294; Cabral and Soldanha 2008). Much earlier in the 1920s on the north coast of Amapá numerous scattered stone pillars were found, some vertical, by Curt Nimuendajú (2004: 15–41). This region of seasonally flooded savanna also contains relic raised fields.

Environmental Impacts

Alexander von Humboldt said long ago in *Views of Nature* (1869: 193) that: "If travelers, the moment they set foot in a tropical region ... imagine that they are within the precincts of a primeval forest, the misconception must be ascribed to their ardent desire of realizing a long cherished wish." Many anthropologists and ethnobotanists are increasingly convinced that the Amazonian forests and savannas and wildlife were extensively to intensively modified by pre-European people. This is mostly inferential based on the hunting, gathering, fishing, forest clearing, plant caring, burning, drainage alteration, trail making, and other activities of native peoples today or historically. Indigenous environmental impacts must have been much greater before 1492 when populations were much larger.

Forests were cleared for cultivation and natural openings were maintained. Savannas were extended by intentional burning. Wild forest fires resulted from escaped field burns. Today, many indigenous fallow fields are not really abandoned. Apparent fallows contain both planted trees and useful wild trees (Denevan and Padoch 1988). Humans discard the seeds of numerous large fruit species and thus modify the distributions of those plants (Guix 2009; also see Balée 1989 and Peters 2000). A good example is the Brazil nut tree (Shepard and Ramirez 2011). People are constantly collecting, planting, and protecting useful plants in both the riverine and the interior forests, as well as in old fields, along vast networks of trails, and around villages and temporary camp sites. Such places have been called forest gardens, or anthropogenic forests, or agroforests – mixtures of wild, semi-domesticated, and domesticated perennials, with a high proportion of useful species.

Laura Rival (2002: 68, 70, 80, 83, 92) describes forest manipulation by the Huarani of eastern Ecuador:

"...men, women, and children spend [many] hours 'cruising' in the forests ... collecting food within a radius of 5 kilometers ... They explored the forest systematically, looking for ... evidence of previous occupation [where useful plants are concentrated] ... numerous plant species are encouraged to grow outside cultivated areas ... [They] exploit plants where they find them in the forest. As a result, they actively manage the forest ... by altering the natural distribution of plant and animal species ... the forest, far from being a pristine environment, is the product [or 'historical record'] of the life activities of past generations."

I can well remember crashing through forest in Peru behind Campa hunters who would suddenly stop to collect something, or to defecate and thereby leave undigested fruit seeds behind which could produce new trees.

Hunting likewise alters the presence, distribution, and concentration of game animals. Spatial studies of various groups show that a single nomadic family can rapidly deplete and rearrange game within a radius of several kilometers from their camp site (Denevan 2007). Peter Stahl has examined evidence for the impact of human-disturbed forests on microvertebrates (2006) and for human-caused changes in distributions of vertebrate faunas in the pre-Columbian Neotropics (2009). On the other hand, some birds and animals are attracted to cultivated fields (Naughton-Treves 2002).

Taking a critical position, paleoecologists Mark Bush and Miles Silman (2007: 463) argue that evidence shows that human disturbance by clearing and burning was

sporadic, mainly riverine. They say that: “Our contention [is] that pre-Columbian transformation of Amazonian landscapes was essentially local and spatially predictable.” However they do not take into consideration anthropogenic forest created by plant and animal manipulation by even sparse populations. Barlow *et al.* (n.d.) also believe that human impacts were mainly localized or “largely imperceptible;” however they appear unaware of much of the considerable literature to the contrary.

Many of us now believe that most Amazonian forests were not pristine in 1492 given clearing, burning, and plant and animal disturbance (Balée 1989, 1994; López-Zent 1998; Roosevelt 1999b, 2000; Peters 2000; Heckenberger *et al.* 2003; Erickson 2006, 2008; Denevan 2007). Nor were savannas pristine, having been altered by burning, earthworks, and hunting (Erickson 2006; Schaaf 2010). Also, deforestation and burning probably contributed to increased global CO₂ emissions, a process reversed after 1492 with native depopulation and forest recovery (Dull *et al.* 2010).

Conclusion

I observed Lathrap's excavation at Yarinacocha a long time ago. Since then Amazonian pre-European history has been rewritten and continues to be rewritten as new discoveries, analyses, and interpretations are made. The Standard Model of simple societies (small autonomous villages) has been replaced by a New Model that includes complex societies with regionally integrated communities, relatively large populations, semi-intensive sustainable cultivation, and widespread but variable environmental impacts. A new group of young Amazonianist archaeologists, soil scientists, ethnobotanists, and geographers have an increasing voice. Our understanding of Amazonian people of the past has changed considerably, and there is relevance to how we approach Amazonia today.

Notes

¹ Limited archaeology in Brazilian Amazonia in part has been because of restrictions on excavation permits to North American archaeologists and also because of the feud between Meggers and Lathrap (Roosevelt 1991: 105-111).

² Meggers (2010: 185) recently repeated her contention that in most of pre-Columbian America the carrying capacity of different environments limited population density, but she does make the qualification: “given the subsistence technology that was available.” However she seems reluctant to accept evidence that agricultural technology could and did change to more intensive (more permanent and more productive) systems over time and space.

³ Fifteen geographers have authored or co-authored 41 articles in the four Amazonian terra preta volumes.

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