The presence of fiber-tempered pottery in different parts of the southeastern United States and the suggestion of linkage among these early pottery traditions is not a new idea (Bullen 1972; Ford 1966). In a review of early American pottery, Betty Jane Meggers (2010:38) argues that early pottery from Florida and Georgia is related to Ecuadoran traditions, suggesting that similar design elements link the two. Meggers’ discussion and accompanying graphic (2010:39) neglect to discuss how such dispersal could have occurred. This type of diffusionistic argument is generally regarded as not perfectly fitting the data (Oyuela-Caycedo and Bonzani 2005) and dismissive of the ingenuity of local groups. I suggest that material culture, bioarchaeological data, and the natural sea currents do provide evidence for a Caribbean connection, and I believe the Greater Antilles are a vital element for our understanding of the fiber-tempered pottery sequence in the New World.

**Current and Historic Thoughts**

As recently as twenty years ago (Fiedel 1992; Walthall 1990), the lack of early pottery in the Caribbean was used as an argument against diffusionistic or migratory models of the spread of fiber-tempered pottery from South to North America. Despite dismissal of Pre-Arawakan pottery in the Caribbean (Rouse 1948, 1992), more recent evaluations of the phenomenon (Keegan and Rodríguez Ramos 2007; Rodríguez Ramos et al. 2008; Samson 2010) indicate that so-called Archaic or Lithic Age inhabitants of the Greater Antilles had a long tradition of ceramic production. Rodríguez Ramos et al. (2008) document Pre-Arawakan pottery primarily in Cuba and the Dominican Republic. Curiously, the earliest dates cited in Cuba are from Cayo Jorajuria (2160 B.C., 1810 B.C., and 1920 B.C., from Jouravelva 2002:36), on the western end of the island (Figure 1). This pottery includes fiber-tempered varieties, something generally absent in later (Arawakan, post-500 B.C.) Saladoid and Ostionoid ceramics.

The southeastern United States has long claimed the oldest pottery in North America. This fiber-tempered pottery appears to have originated in south Georgia, and is mostly found in Florida, Georgia, the Carolinas, and Alabama. Though such pots would likely disintegrate in colder climes (Reid 1984; Skibo et al. 1989), fiber-tempered pottery is easier to manufacture and lighter than pottery made with pastes containing predominantly mineral inclusions, making it ideal for mobile groups (Skibo et al. 1989). We tend to assume that mobile hunter-gatherers would not have pottery, as ceramic technologies are linked to the Neolithic Revolution (Pratt 1999). Our assumptions about “Archaic” populations are currently changing, as ongoing work in the Southeast (Kidder and Sassaman 2009) and Caribbean (Colten et al. 2009) challenge previously-held beliefs. For example, recent research suggests the “Archaic” people in the Caribbean significantly altered their environments and planted non-indigenous vegetation (Newsome 2005) as well as cultigens from the mainland such as maize and beans (Ramos Rodríguez and Jimenez 2006). Similarly, Jamie Waggoner (2009) found suggestions of directed burning to promote plant growth in the Archaic Southeast.

Recent research in South America has uncovered an ancient fiber-tempered pottery tradition. Augusto Oyuela-Caycedo documented fiber-tempered pottery at San Jacinto 1 which has been dated to approximately 5000 cal B.P. (Oyuela-Caycedo and Bonzani 2005) and Anna Roosevelt (1998) found pottery in contexts which date to over 7000 B.P. at Taperinha and Pedra Pintada. Roosevelt (1998:198) provocatively suggests that some archaeologists in South America may have withheld dates that did not fit within established cultural history schemes.

Given the discussion above, the South American and Caribbean connection is likely missed, in part, due to the emerging separate professional literatures in the late twentieth century (when was the last time you saw an article about Florida in Latin American Antiquity or the Journal of Caribbean Archaeology?). Though we may pass each other in corridors, both hallways and survey, rarely do we put all of the pieces together. These pages are not intended as a final word on this research, but as a note that might encourage further and more meaningful dialog between researchers in South America, the Caribbean, Florida, and the greater Southeast. Due to politics, the ongoing processes of regional specialization, and the professionalization of archaeology, few archaeologists have participated in field work in the Southeast, the Caribbean, and South America, especially when compared to previous generations. The gentlemen antiquarians and early professional archaeologists (Fewkes and Mason through Rouse and the Bullens) were not limited by national boundaries or regional specialization.

Connections between South America and Cuba have been previously documented, though generally in terms of the origins of pottery styles/culture (conflated in the accepted...
Rouese-ian culture history) and high status artifacts. Cooper et al. (2008) link metal objects from Cuban contact-period contexts to South America, though these items could be from “down the line” trading. Richard T. Callaghan (2003) suggests direct trade may have been faster and safer than trips through the Lesser Antilles, particularly if the so-called Caribs of the Lesser Antilles truly were hostile toward their neighbors. In a similar vein to these pages, Callaghan (2001, 2003) has been employing computer simulations to discuss possible origin points for various migratory waves. In brief, Callaghan (2003) sees northern South America as a likely origin for the expressly preceramic inhabitants of the Greater Antilles, citing both computer simulation of voyages and artifactual similarities, primarily in lithic technologies. Additionally, Callaghan (2001) asserts that, based on historically documented drift voyages, a reasonable time out on the open water was presumed to be four to five weeks with a 10% loss of starting population.

**Proposing a Current(s) Model**

In all honesty, this project began as an experiment in a method. I was attempting to model simple particle flow; that is, “message in a bottle” movement of vessels following currents. This was intended as a first step in a more robust program of tracing possible migration routes through the Caribbean as part of a larger project which attempts to conceptualize the movement of people beyond the boundaries of the sites we can excavate. The germ of this particular case study comes from interactions with Dr. Kenneth Sassaman and Dr. Augusto Oyuela-Caycedo, and their generous sharing of respective experiences with Stallings Island and San Jacinto pottery traditions.

The analysis presented here was conceptualized in IDRISI Taiga and ESRI ArcMap 9.3, and completed using ArcMap with the Spatial Analyst extension. The model uses rasters (gridded data) and outputs data in shapefiles (lines) and data tables. In the base data, each cell is a single degree of longitude and latitude, approximately 67 miles. This is an admittedly coarse scale, but appropriate for the geographical proportions discussed here. The data come from ongoing research conducted at the Rosenstiel School of Marine and Atmospheric Science at the University of Miami, the Cooperative Institute for Marine and Atmospheric Studies, and the National Oceanographic Partnership Program (Mariano et al. 1995). Using data from the Coast Guard and the National Oceanographic and Atmospheric Administration, the product describes how worldwide currents flow in terms of both direction and magnitude. The data are provided as delimited

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**Figure 1.** Site locale and associated dates for ceramic production by Archaic or Lithic Age inhabitants of the Greater Antilles.
text, which can be readily converted into rasters using any remote sensing or GIS software, though some trigonometry is required to produce a direction raster.

It should be noted that the data were slightly modified, as the original delimited text tables did not include any area which falls in the same degree of longitude or latitude as land. Simple raster math placed a slight current in these locations, in order to allow the model to begin on land. The consequence of this, of course, is that the model no longer would allow the tracked path to end on land. This odd artifact of the data is easily interpreted, i.e. when the path approaches land then veers away, this is the result of the manually added current. The resulting model does not have the stochastic variability experienced on the open seas, but does provide a general model of current flow. Armed with direction and magnitude rasters, the end result of this work is that the flow of currents in and out of the Caribbean can be visualized and employed in GIS-based models (Figure 2).

The resultant model is fairly simple and can be conceptually reduced to the metaphor of a message in a bottle. When the bottle is thrown into the sea the currents control where it ends up: there is no steering or attempt to reach land. The simulation is not meant to reflect all of the possibilities in a world inhabited by active agents, only to offer a glimpse of the affordances provided within the Caribbean basin. In the simplified model, the initial seed is subjected to direction and speed of the first cell, with steps and course alterations every one-half cell, or every 17 miles. After each leg, the next direction and speed are calculated based on the current cell. The result is a linear shapefile (vector) with the speed, direction, and elapsed time of each step recorded to the ancillary data. As the resulting modeled journey does not include any agent modeling, it is safe to assume this is an extraordinarily conservative depiction of traveling in the precontact Caribbean; even the most unhurried paddling (averaging 8 km per hour above the current speed) would significantly reduce the travel time. This would allow people in a canoe to reach Cuba from Columbia in a little over nine and a half days (Figure 3). Still a daunting voyage, no doubt, but well less than the four to five week drift voyages cited as survivable by Callaghan (2001). It is worth noting that slight deviations in the current or paddling result in the simulation reaching landfall in Louisiana, an observation that may offer a connection to the early fiber-tempered wares found in this region (Webb 1968).

The particle flow model links directly Columbia to Cuba, bypassing the Yucatan or potential “down the line” trading through the generally presumed “safer” passage through the Lesser Antilles. If coupled with a model of the visible sphere of the Greater Antilles (Torres and Rodriguez Ramos 2008), the

![Figure 2. GIS-based model of the flow of currents in and out of the Caribbean.](source: Mariano et al 1995)
The Florida Anthropologist

116

2011 Vol. 64(2)

target area would be conceivably much larger. The important note here is that the model does not stop in southeastern or southwestern Florida, but instead leads directly to the part of the Southeast where Sassaman (2004) places the origin of fiber-tempered pottery in North America.

All of this supports the recently published data suggesting genetic links between the prehistoric populations of Florida, Cuba, and northern South America. Dental morphological traits link Florida and northwestern South America, and differentiate these regions from the Ceramic Age (Arawakan) Caribbean populations (Coppa et al. 2008). The shape and size of various cranial features link populations in northwestern South America, Cuba, and Florida (Ross and Ubelaker 2010), again forming significant data clusters separate from the rest of the Caribbean. Finally, isotopic bone signatures initially regarded as outliers, or even errors, suggest at least one possible natal Caribbean Islander in an Archaic period burial mound in Florida (Bryan Tucker, personal communication 2011).

Conclusion

Previous research has cited a lack of evidence for the Amazon as a potential origin for fiber-tempered pottery coming in to North America (Hoopes 1994). However, linguistic analysis suggests that the Timucua people of northeast Florida arrived there via northwestern South America, or at least indicates a significant contact between these two regions at 3000–2500 B.C. (Granberry 1993). I hope that the simulation analysis of Caribbean currents presented above, together with published linguistic and bioarchaeological data, provide suggestions that such connections are possible. This is not to discount the notion that the southeastern United States or Cuba were cultural “hearts” (sensu Hoopes 1994; Reid 1984) for the invention of pottery. And I do not mean to suggest that the indigenous people of either region lacked the creativity or intelligence to develop such ceramic technologies on their own (which would be a most uncreative and unintelligent suggestion). Rather than suggest that people lacked creativity, I believe these data suggest that the Archaic peoples of the Americas (North, South, and Central) and in the Caribbean engaged in long-distance travel and trade that indicates a complexity and understanding of the world rarely ascribed to hunter-gathers. Some of the “Stone Age” inhabitants of the Americas, in fact, apparently traveled and were more knowledgeable of the world than many of the archaeologists who study them.

Notes

1. These dates are presented uncalibrated, as the authors do not report the material, uncertainty, and sample numbers.

Figure 3. Based on presented data, canoe travel to Cuba from Columbia would take just over nine days.
2. A raster is a file type which uses cells to hold and analyze data, and can be expressed in terms of pixels.
3. A shapefile is a file type with a set geometry (point, line, polygon) and can be expressed as a vector.

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