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Issue Date: 2019-04-18

Bibliography

Acevedo Rodríguez, P. & M. T. Strong, 2012. *Catalogue of Seed Plants of the West Indies.* Washington D.C.: Smithsonian Institution Scholarly Press.

Adams, J. L., 2002. Mechanisms of wear on ground stone surfaces, in *Moudre et broyer. L'interprétation fonctionnelle de l'outillage de mouture et de broyage dans la Préhistoire et l'Antiquité*, eds. H. Procopiou & R. Treuil. Paris: CTHS, 57-68.

Adams, J. L., 2008. Beyond the Broken, in *New Approaches to Old Stones*, eds. Y. M. Rowan & J. R. Ebeling. London: Equinox, 213-229.

Adams, J. L., 2013. *Ground Stone Analysis: A Technological Approach.* Salt Lake City: University of Utah Press.

Adams, J. L., 2014. Ground stone use-wear analysis: a review of terminology and experimental methods. *Journal of Archaeological Science,* 48, 129-138.

Adams, J. L., J. S. Delgado, L. Dubreuil, C. Hamon, H. Plisson & R. Risch, 2009. Functional analysis of macro-lithic artefacts: A focus on working surfaces, in *Non-flint Raw Material Use in Prehistory: Old Prejudices and New Directions*, eds. F. Sternke, L. Costa & L. Eigeland. Oxford: Archaeopress, 43–66.

Akerman, K., R. Fullagar & A. L. Van Gijn, 2002. Weapons and *wunan*. Production, function and exchange of Kimberley points. *Australian Aboriginal Studies,* 1, 13-42.

Alberti, B., S. Fowles, M. Holbraad, Y. Marshall & C. Witmore, 2011. "Worlds Otherwise": Archaeology, Anthropology, and Ontological Difference. *Current Anthropology,* 52(6), 896-912.

Alegría, R. E., 1981. La Incrustación en la Escultura Aborigen Antillana, in *The Ninth International Congress for the study of the pre-Columbian Cultures of the Lesser Antilles*, eds. L. Allaire & F.-M. Mayer. Santo Domingo: Centre de Recherches Caraïbes, Université de Montréal, 325-347.

Alegría, R. E., 1993. Apuntes sobre la vestimenta y los adornos de los caciques Taínos de las Antillas y de la parafernalia asociada de sus funciones mágico-religiosas, in *15th International Congress for Caribbean Archaeology*, eds. R. E. Alegría & M. Rodríguez Lopez. San. Juan: Centro de Estudios Avanzados de Puerto Rico y el Caribe, 295-309.

Allaire, L., 1980. On the Historicity of Carib Migrations in the Lesser Antilles. *American Antiquity,* 45(2), 238-245.

Allaire, L., 1997. The Caribs of the Lesser Antilles, in *The Indigenous people of the Caribbean*, ed. S. M. Wilson. Gainesville: University of Florida Press, 179-185.

Allaire, L., 2013. Ethnohistory of the Caribs, in *The Oxford Handbook of Caribbean Archaeology*, eds. W. F. Keegan, C. L. Hofman & R. Rodríguez Ramos. Oxford: Oxford University Press, 97-108.

Allaire, L. & D. T. Duval, 1993. St. Vincent revisited, in *15th International Congress for Caribbean Archaeology*, eds. R. E. Alegría & M. Rodríguez Lopez. San Juan: Centro de Estudios Avanzados de Puerto Rico y el Caribe, 255-262.

Allen, M. S. & E. Ussher, 2013. Starch analysis reveals prehistoric plant translocations and shell tool use, Marquesas Islands, Polynesia. *Journal of Archaeological Science,* 40(6), 2799-2812.

Allsworth-Jones, P., 2008. *Pre-Columbian Jamaica.* Tuscaloosa: University of Alabama Press.

Alvarez Soncini, M. C. & M. E. Mansur, 2017. Pecked and polished materials from southern Patagonia: An experimental techno-functional approach. *Quaternary International,* 427, Part B, 66-73.

Amaral, M. M. V., 1995. *As oficinas líticas de polimento da Ilha de Santa Catarina.* MA dissertation. Porto Alegre: Pontificia Universidade Católica do Rio Grande do Sul.

Andersen, H. H. & H. J. Whitlow, 1983. Wear traces and patination on Danish flint artefacts. *Nuclear Instruments and Methids in Physics Research,* 218, 468-474.

Anderson, P. C., 1980. A testimony of Prehistoric Tasks: Diagnostic Residues on tool working edges *World Archaeology,* 12(2), 181-194.

Anderson, P. C., L. Astruc, R. Vargiolu & E. H. Zahouani, 1998. Contribution of quantitative analysis of surface states to a multi-method approach for characterizing plant-processing traces on flint tools with gloss, in *Functional Analysis of Lithic Artefacts: Current State of Research. Proceedings of the XIII Congress of International Union of Prehistoric and Protohistoric Sciences (UISPP).* Forli: ABACO, 1151-1160.

Anderson, P. C., J. M. Georges, R. Vargiolu & H. Zahouani, 2006. Insights from a tribological analysis of the tribulum. *Journal of Archaeological Science,* 33(11), 1559-1568.

Anderson-Gerfaud, P. C., 1981. *Contribution méthodologique à l´analyse des microtraces d´utilisation sur les ouils préhistoriques.* PhD thesis. Bordeaux: Université de Bordeaux I, Institut du Quaternaire.

Anderson-Gerfaud, P. C., 1982. Comment precisier lútilisation agricole des outils prehistoriques? *Cahiers de l'Euphrate,* 3, 149-164.

Anderson-Gerfaud, P. C., 1986. A few comments concerning residue analysis of stone plant-processing tools, in *Technical aspects of microwear studies on stone tools*, eds. L. Owen & G. Unrath. Early Man News 9/10/11, 69-81.

Anderson Córdova, K. F., 2017. *Surviving Spanish Conquest: Indian fight, flight, and cultural transformation in Hispaniola and Puerto Rico.* Tuscaloosa: University of Alabama press.

Andrefsky, W. jr., 2008. An Introduction to Stone Tool Life History and Technological Organization, in *Lithic Technology: Measures of production, use, and curation*, ed. W. jr. Andrefsky. Cambridge: Cambridge University Press, 3-22.

Andrieu, C., E. Rodas & L. Luin, 2014. The values of classic Maya jade: A reanalysis of Cancuen's jade workshop. *Ancient Mesoamerica,* 25(1), 141-164.

Antczak, A. T., 1995. Mammal bone remains from the late prehistoric Amerindian sites on Los Roques archipelago, Venezuela; An interpretation, in *16th International Congress for Caribbean Archaeology*, ed. G. Richard. Basse-Terre, Guadeloupe: Conseil Régional de la Guadeloupe et Auditorium de la Ville de Basse-Terre, 83-99.

Antczak, A. T., 1998. *Late Prehistoric Economy and Society of the Islands off the Coast of Venezuela: A Contextual Interpretation of the Non-Ceramic Evidence.* PhD Thesis. London: University College London, Institute of Archaeology.

Antczak, A. T., M. M. Antczak & J. Arturo, 2018. Debating lithics from pre-colonial sites in Los Roques Archipelago, Venezuela (AD 1000-1500), in *Multas per Gentes et Multa per Saecula: Amici magistro et collegae suo Ioanni Christopho Kozłowski dedicant*, eds. P. Valde-Nowak, K. Sobczyk, M. Nowak & J. Źrałka. Kraków: Institute of Archaeology, Jagiellonian University, 669-688.

Antczak, M. M. M. d. & A. Antczak, 2006. *Los Idolos de las Islas Prometidas: Arqueología prehispánica del Archipiélago de Los Roques.* Caracas: Equinoccio.

Aoyama, K., T. Inomata, F. Pinzón & J. M. Palomo, 2017. Polished greenstone celt caches from Ceibal: the development of Maya public rituals. *Antiquity,* 91(357), 701-717.

Appadurai, A., 1986a. Introduction: commodities and the politics of value, in *The social life of things: commodities in cultural perspective*, ed. A. Appadurai. Cambridge: Cambridge University press, 3-63.

Appadurai, A. (ed.) 1986b. *The Social Life of Things: Commodities in cultural perspective,* Cambridge: Cambridge University Press.

Arculus, R. J., 1976. Geology and geochemistry of the alkali basalt—andesite association of Grenada, Lesser Antilles island arc. *Geological Society of America Bulletin,* 87(4), 612-624.

Arculus, R. J., 1978. Mineralogy and petrology of Grenada, Lesser Antilles island arc. *Contributions to Mineralogy and Petrology,* 65(4), 413-424.

Aretz, I., 1991. *Musica de los Aborigines de Venezuela.* Caracas: Fundef-Conac.

Århem, K., 1990. Ecosofia Makuna, in *La Selva Humanizada: Ecologia alternativa en el trópico húmedo Colombiano*, ed. F. Correa. Bogotá: Instituto Colombiano de Antropología, 109-126.

Århem, K., 1996. The cosmic food web: Human-nature relatedness in the northwest Amazon, in *Nature and Society: Anthropological perspectives*, eds. P. Descola & G. Pálsson. London: Routledge, 185-204.

Arrom, J. J., 1974. Estudio preliminar, in *Relación acerca de las antigüedades de los Indios. Nueva versión con notas, mapa y apéndices por José Juan Arrom*México: Siglo XXI Editores, 1-20.

Arrom, J. J., 1975. *Mitología y Artes Prehispánicas de las Antillas.* México: Siglo XXI Editores.

Asryan, L., A. Ollé & N. Moloney, 2014. Reality and confusion in the recognition of post-depositional alterations and use-wear: an experimental approach on basalt tools. *Journal of Lithic Studies,* 1(1), 9-32.

Astruc, L., R. Vargiolu, M. Ben Tkaya, N. Balkan-Atlı, M. Özbaşaran & H. Zahouani, 2011. Multi-scale tribological analysis of the technique of manufacture of an obsidian bracelet from Aşıklı Höyük (Aceramic Neolithic, Central Anatolia). *Journal of Archaeological Science,* 38(12), 3415-3424.

Attenbrow, V., R. L. K. Fullagar & C. Szpak, 1998. Reassessing the chronology and function of stone files in southeastern Australia and implications for the manufacture of shell fish-hooks, in *A Closer Look: Recent Studies of Australian Stone Tools*, ed. R. L. K. Fullagar. Sydney: University of Sydney, 127-148.

Atwood, T., 1791. *The History of the Island of Dominica. Containing a description of its situation, extent, climate, mountains, rivers, natural productions, &c. &c. together with an account of the civil government, trade, laws, customs, and manners of the different inhabitants of that island. Its conquest by the French, and restoration to the British dominions.* Trowbridge & London: Frank Cass & Company.

Audouze, F., P. Bodu, C. Karlin, M. Julien, J. Pelegrin & C. Perlès, 2017. Leroi-Gourhan and the chaîne opératoire: a response to Delage. *World Archaeology,* 49(5), 718-723.

Avery, R. & R. J. Etter, 2006. Microstructural differences in the reinforcement of a gastropod shell against predation. *Marine Ecology Progress Series,* 323, 159-170.

Bains, R., 2012. *The Social Significance of Neolithic Stone Bead Technologies at Çatalhöyük.* London: University College London, Institute of Archaeology.

Balée, W., 1994. *Footprints of the Forest: Ka'apor ethnobotany - the historical ecology of plant utilization by an Amazonian people.* New York: Columbia University Press.

Balfet, H., 1991. Des chaînes opératoires, pour quoi faire?, in *Observer l'Action Technique: Des chaînes opératoires, pour quoi faire?*, ed. H. Balfet. Paris: Editions du CNRS, 11-19.

Bamforth, D. B., 1988. Investigating microwear polishes with blind tests: The institute results in context. *Journal of Archaeological Science,* 15(1), 11-23.

Bamforth, D. B., 1993. Stone Tools, Steel Tools: Contact Period Household Technology at Helo', in *Ethnohistory* *and Archaeology: Approaches to Postcontact Change in the Americas*, eds. J. D. Rogers & S. M. Wilson. New York: Springer, 49-72.

Bamforth, D. B., 2010. Conducting Experimental Research as a Basis for Microwear Analysis, in *Designing experimental research in archaeology: Examining technology through production and use*, ed. J. R. Ferguson. Boulder: University Press of Colorado, 93-109.

Bamforth, D. B., G. R. Burns & C. Woodman, 1990. Ambiguous use traces and blind test results: New data. *Journal of Archaelogical Science,* 17, 413-430.

Bamforth, D. B. & N. Finlay, 2008. Introduction: archaeological approaches to lithic production skill and craft learning. *Journal of Archaeological Method and Theory,* 15(1), 1-27.

Barbotin, M., 1971. Archéologie Caraïbe et Chroniqueurs. *Bulletin de la Société d'Histoire de la Guadeloupe,* 15/16, 53-67.

Barbotin, M., 1974. Archéologie Caraïbe et Chroniqueurs : Suite. *Bulletin de la Société d'Histoire de la Guadeloupe,* (21), 41-68.

Barcelos Neto, A., 2008. *Apapaatai : Rituais de Máscaras no Alto Xingu.* São Paulo: Editora da Universidade de São Paulo.

Barcelos Neto, A., 2009. The (de)animalization of objects: Food offerings and subjectivization of masks and flutes among the Wauja of southern Amazonia, in *The Occult Life of Things: Native Amazonian theories of materiality and personhood*, ed. F. Santos-Granero. Tucson: The University of Arizona Press, 128-151.

Barkai, R. & R. Yerkes, 2008. Stone axes as cultural markers: technological, functional and symbolic changes in bifacial tools during the transition from hunter-gatherers to sedentary agriculturalists in the southern Levant, in *'Prehistoric Technology' 40 years later: gunctional Studies and the Russian Legacy. Proceedings of the International Congress Verona (Italy), 20-23 April 2005*, eds. L. Longo & N. Skakun. Oxford: Archaeopress, 159-167.

Barthelat, F., J. E. Rim & H. D. Espinosa, 2009. A review on the structure and mechanical properties of mollusk shells - perspectives on synthetic biomimetric materials, in *Applied Scanning Probe Methods XIII*, eds. B. Bhushan & H. Fuchs. Springer, 1059-1100.

Bartone, R. N. & J. G. Crock, 1991. Flaked Stone Industry at the Early Saladoid Trants Site, Montserrat, West Indies, in *14th International Congress for Caribbean Archaeology*, eds. A. Cummins & P. King. Barbados: The International Association for Caribbean Archaeology, 124-146.

Beck, R. J. & M. Mason, 2002. *Mana Pounamu. New Zealand Jade.* New Zealand: Reed.

Beckles, H. M., 2008. Kalinago (Carib) Resistance to European Colonisation of the Caribbean. *Caribbean Quarterly,* 54(4), 77-94.

Beeker, C. D., G. W. Conrad & J. F. Foster, 2002. Taíno use of flooded caverns in the East National Park region, Dominican Republic. *Journal of Caribbean Archaeology,* 3, 1-26.

Benn Torres, J., 2014. Prospecting the past: genetic perspectives on the extinction and survival of indigenous peoples of the Caribbean. *New Genetics and Society,* 33(1), 21-41.

Benn Torres, J., 2016. Genetic Anthropology and Archaeology: Interdisciplinary Approaches to Human History in the Caribbean. *PaleoAmerica,* 2(1), 1-5.

Bérard, B., 2008. Lithic Technology: A Way to More Complex Diversity in Caribbean Archaeology, in *Crossing the Borders: New methods and techniques in the study of archaeological materials from the Caribbean*, eds. C. L. Hofman, M. L. P. Hoogland & A. L. Van Gijn. Tuscaloosa: University of Alabama Press, 90-100.

Bercht, F., E. Brodsky, J. A. Farmer & D. Taylor (eds.), 1997. *Taíno: Pre-Columbian Art and Culture from the Caribbean,* New York: El Museo del Barrio/The Monacelli Press.

Berman, M. J., 2011. Good as gold: The aesthetic brilliance of the Lucayans, in *Islands at the Crossroads: Migration, Seafaring, and interaction in the Caribbean*, eds. L. A. Curet & M. W. Hauser. Tuscaloosa: University of Alabama Press, 104-134.

Berman, M. J. & D. M. Pearsall, 2000. Plants, People, and Culture in the Prehistoric Central Bahamas: a view from the Three Dog site, an Early Lucayan settlement on San Salvador Island, Bahamas. *Latin American Antiquity,* 11(3), 219-239.

Berman, M. J. & D. M. Pearsall, 2008. At the Crossroads: Starch Grain and Phytolith Analyses in Lucayan Prehistory. *Latin American Antiquity,* 19(2), 181-203.

Berman, M. J., A. K. Sievert & T. R. Whyte, 1999. Form and Function of Bipolar lithic artifacts from the Three Dog site, San Salvador, Bahamas. *Latin American Antiquity,* 10(4), 415-432.

Beyries, S., 1982. Comparaison de traces d'utilisation sur différentes roches siliceuses. *Studia Praehistoria Belgica,* 2, 235-240.

Beyries, S. & V. Rots, 2008. The contribution of ethnoarchaeological macro- and microscopic wear traces to the understanding of archaeological hide-working processes, in *"Prehistoric Technology" 40 years later: Functional Studies and the Russian Legacy. Proceedings of the International Congress Verona (Italy), 20-23 April 2005*, eds. L. Longo & N. Skakun. Oxford: Archaeopress, 21-28.

Bhushan, B., 2013. *Introduction to Tribology, 2nd Edition.* New York: John Wiley & Sons, Ltd.

Bianchi, C. y. A. A. V. V., 1982. *Artesanías y técnicas Shuar.* Quito: Ediciones Mundo Shuar.

Bilhaut, A.-G., 2006. Biographie d'un esprit au corps brisé. Les pierres magiques des ancêtres Zapara d'Amazonie : des sujets du passé. *Journal de la Société des Américanistes,* 92, 237-254.

Binneman, J. & J. Deacon, 1986. Experimental determination of use wear on stone adzes from Boomplaas Cave, South Africa. *Journal of Archaeological Science,* 13(3), 219-228.

Biocca, E., 1965. *Viaggi tra gli Indi: Alto Rio Negro - Alto Orinoco. Appunti di un biologo. Volume Primo: Tukâno - Tariâna - Baniwa - Makú.* Rome: Consiglio Nazionale delle Ricerche.

Blanco-González, A., 2014. Tracking the social lives of things: biographical insights into Bronze Age pottery in Spain. *Antiquity,* 88(340), 441-455.

Bloch, M. & J. Parry, 1989. Introduction: Money and the morality of exchange, in *Money and the morality of exchange*, eds. J. Parry & M. Bloch. Cambridge: Cambridge University Press, 1-32.

Blumenschine, R. J., K. A. Prassack, C. D. Kreger & M. C. Pante, 2007. Carnivore tooth-marks, microbial bioerosion, and the invalidation of Dominguez-Rodrigo and Barba's (2006) test of Oldowan hominin scavenging behavior. *Journal of Human Evolution,* 53(4), 420-426.

Boer-Mah, T., 2008. Reduction and adze form: Ground stone adzes from Ban Non Wat, northeast Thailand. *Indo-pacific prehistory association bulletin,* 28, 44-51.

Boleti, A., H. Procopiou, P. Pétrequin, A.-M. Pétrequin, R. Vargiolu & H. Zahouani, 2015. Use-wear traces on stone axes: Compiling a reference database by applying surface analysis methods on ethnographic data (Pétrequin Collection from New Guinea), in *AWRANA 2015. Connecting people and technologies*, eds. A. L. Van Gijn, B. Chan, G. H. J. Langejans, A. Sorensen, C. Tsoraki & A. Verbaas Leiden: Sidestone Press, 104-105.

Boomert, A., 1986. The Cayo Complex of St. Vincent: Ethnohistorical and Archaeological Aspects of the Island Carib Problem. *Antropologica,* 66, 3-68.

Boomert, A., 1987. Gifts of the Amazons: "Green Stone" Pendants and Beads as Items of Ceremonial Exchange in Amazonia and the Caribbean. *Anthropologica,* 67, 33-54.

Boomert, A., 1995. Island Carib archaeology, in *Wolves from the Sea: Readings in the anthropology of the native*

Caribbean, ed. N. L. Whitehead. Leiden: KITLV Press, 23-35.

Boomert, A., 1999. Saladoid Sociopolitical Organization, in *18th International Congress for Caribbean Archaeology.* St. George, Grenada, 55-77.

Boomert, A., 2000. *Trinidad, Tobago and the Lower Orinoco Interaction Sphere. An Archaeological/ Ethnohistorical Study.* Alkmaar: Cairi Publications.

Boomert, A., 2004. Koriabo and the Polychrome Tradition: the late-prehistoric era between the Orinoco and Amazon mouths, in *Late Ceramic Age Societies in the Eastern Caribbean*, eds. A. Delpuech & C. L. Hofman. Oxford: Archaeopress, 251-266.

Boomert, A., 2007. Exotics from Pearls, Grenada: A preliminary assessment, in *22nd conference of the International Association for Caribbean Archaeology.* Kingston, Jamaica, 1-25.

Boomert, A., 2009. Between the Mainland and the Islands: The Amerindian Cultural Geography of Trinidad. *Bulletin of the Peabody Museum of Natural History,* 50(1), 63-73.

Boomert, A., 2011. From Cayo to *Kalinago*: Aspects of Island Carib archaeology, in *Communities in Contact: Essays in archaeology, ethnohistory & ethnography of the Amerindian circum-Caribbean*, eds. C. L. Hofman & A. Van Duijvenbode. Leiden: Sidestone Press, 291-306.

Boomert, A., 2013. Gateway to the Mainland: Trinidad and Tobago, in *The Oxford Handbook of Caribbean Archaeology*, eds. W. F. Keegan, C. L. Hofman & R. Rodríguez Ramos. Oxford: Oxford University Press, 141-154.

Boomert, A. & L. Kameneff, 2003. Preliminary Report on Archaeological Investigations at Great Courland Bay, Tobago, in *Twentieth International Congress for Caribbean Archaeology*, eds. C. Tavárez María & M. A. García Arévalo. Santo Domingo, Dominican Republic: Museo del Hombre Dominicano & Fundación García Arévalo, 457-468.

Boomert, A. & S. B. Kroonenberg, 1977. Manufacture and Trade of Stone Artifacts in Prehistoric Surinam, in *Ex Horreo*, eds. B. L. Beek, van, R. W. Brandt & W. Groenman-van Waateringe. Amsterdam: Universiteit van Amsterdam, Albert Egges van Giffen Instituut voor Prae- en Protohistorie, 9-46.

Boomert, A., A. A. A. Mol, C. L. Hofman, M. L. P. Hoogland, J. E. Laffoon & J. L. J. A. Mans, 2015. Archaeological rescue investigations at the multicomponent indigenous site of Brighton Beach: New insights into the cultural history of St. Vincent and The Grenadines, in *26th International Congress for Caribbean Archaeology*, eds. C. B. Velasquez & J. B. Haviser. Maho, St. Martin.

Boomert, A. & C. T. Rogers, 2005. Troumassoid stone artifacts in Tobago: rock types and source areas, in *XXI Congress of the International Association for Caribbean Archaeology*, eds. B. A. Reid, H. Petitjean Roget & L. A. Curet. St. Augustine: School of Continuing Studies, University of the West Indies, 282-294.

Borel, A., A. Ollé, J. M. Vergès & R. Sala, 2014. Scanning Electron and Optical Light Microscopy: two complementary approaches for the understanding and interpretation of usewear and residues on stone tools. *Journal of Archaeological Science,* 48, 46-59.

Boschin, F. & J. Crezzini, 2012. Morphometrical Analysis on Cut Marks Using a 3D Digital Microscope. *International Journal of Osteoarchaeology,* 22(5), 549-562.

Boschung, D., P.-A. Kreuz & T. Kienlin (eds.), 2015. *Biography of Objects: Aspekte eines kulturhistorischen Konzepts,* Paderborn: Wilhelm Fink Verlag.

Boucher, P. P., 1992. *Cannibal Encounters: Europeans and Island Caribs, 1492–1763.* Baltimore: Johns Hopkins University Press.

Bradfield, J., 2015. Use-trace analysis of bone tools: A brief overview of four methodological approaches. *South African Archaeological Bulletin,* 70(201), 3-14.

Bradfield, J., 2016. Use-Trace Epistemology and the Logic of Inference. *Lithic Technology,* 41(4), 293-303.

Bradley, R. & C. Clayton, 1987. The influence of flint microstructure on the formation of microwear polishes, in *The human uses of flint and chert: Papers from the Fourth International Flint Symposium*, eds. G. Sieveking & M. H. Newcomer. Cambridge: Cambridge University Press, 81-89.

Brea, M. B., M. Errera, P. Mazzieri, S. Occhi & P. Pétrequin, 2012. Les haches alpines dans la culture des VBQ et Emilie occidentale : contexte, typologie, chronologie et origine des matières premières, in *Jade. Grandes haches alpines du Néolithique européen. V*[e] *et IV*[e] *millénaires av. J.-C.*, eds. P. Pétrequin, S. Cassen, M. Errera, L. Klassen, A. Sheridan & A.-M. Pétrequin. Besançon: Universitaires de Franche-Comté, 822-871.

Breglia, F., I. Caricola & F. Larocca, 2016. Macrolithic tools for mining and primary processing of metal ores from the site of Grotta della Monaca (Calabria, Italy). *Journal of Lithic Studies,* 3(3), 57-76.

Breukel, T. W., 2013. *Threepointers on Trial: A biographical study of Amerindian ritual artefacts from the pre-Columbian Caribbean.* MA (research) thesis. Leiden: Leiden University, Faculty of Archaeology.

Breukel, T. W., 2015. Greenstone axe biographies from the northern and eastern Dominican Republic (AD 800 - 1504), in *AWRANA 2015. Connecting people and technologies*, eds. A. L. Van Gijn, B. Chan, G. H. J. Langejans, A. Sorensen, C. Tsoraki & A. Verbaas. Leiden: Sidestone Press, 105.

Breukel, T. W. & C. G. Falci, 2015. Experimental reproduction of wear traces on shell, coral, and lithic materials from the pre-colonial Caribbean, in *26th Congress of the International Association for Caribbean Archaeology*, eds. C. B. Velasquez & J. B. Haviser. Maho, St. Martin: SIMARC.

Breukel, T. W., C. G. Falci, A. C. S. Knaf, J. M. Koornneef, A. L. Van Gijn, G. R. Davies & C. L. Hofman, 2015. Museum artefact biographies: aspects and issues for microwear and provenance analyses in circum-Caribbean collections, in *21st Annual Meeting of the European Association of Archaeologists*, eds. R. H. Tykot & A. Vianello. Glasgow.

Briels, I., 2004. *Use-wear analysis on the Archaic flint assemblage of Plum Piece, Saba: A pilot study.* MA thesis. Leiden: Leiden University, Faculty of Archaeology.

Bromage, T. G., 1984. Interpretation of scanning electron microscopic images of abraded forming bone surfaces. *American Journal of Physical Anthropology,* 64(2), 161-178.

Brysbaert, A., 2007. Cross-craft and cross-cultural interactions during the Aegean and eastern mediterranean Late Bronze Age, in *Mediterranean Crossroads*, eds. S. Antoniadou & A. Pace. Athene: Pierides Foundation Publications, 325-359.

Brysbaert, A., 2008a. Painted plaster from Bronze Age Thebes, Boeotia (Greece): a technological study. *Journal of Archaeological Science,* 35(10), 2761-2769.

Brysbaert, A., 2008b. *The power of technology in the Bronze Age eastern Mediterranean: The case of the painted plaster.* London: Equinox.

Brysbaert, A., 2011a. Technologies of reusing and recycling in the Aegean and beyond, in *Tracing prehistoric social networks through technology: A diachronic perspective on the Aegean*, ed. A. Brysbaert. London: Routledge, 183-203.

Brysbaert, A. (ed.) 2011b. *Tracing prehistoric social networks through technology: A diachronic perspective on the Aegean,* London: Routledge.

Brysbaert, A. & M. Vetters, 2013. A moving story about 'exotica': objects' long-distance production chains and associated identities at Tiryns, Greece *Opuscula: Annual of the Swedish Institutes at Athens and Rome,* 2013(6), 36.

Buc, N., 2011. Experimental series and use-wear in bone tools. *Journal of Archaeological Science,* 38(3), 546-557.

Buc, N. & D. Loponte, 2007. Bone Tool Types and Microwear Patterns: Some Examples from the Pampa

Region, South America, in *Bones as Tools: Current methods and interpretations in worked bone studies*, eds. C. Gates St.-Pierre & R. B. Walker. Oxford: Archaeopress, 143-157.

Buc, N., R. Silvestre & D. Loponte, 2010. What about shells? Analysis of shell and lithic cut-marks. The case of the Paraná's wetland, Argentina. *Munibe,* 31, 35-43.

Buchanan, B., M. J. Hamilton, J. D. Kilby & J. A. M. Gingerich, 2016. Lithic networks reveal early regionalization in late Pleistocene North America. *Journal of Archaeological Science,* 65, 114-121.

Bucher, K. & R. Grapes, 2011. *Petrogenesis of Metamorphic Rocks. 8th edition.* Heidelberg: Springer.

Bueno, L., 2010. Beyond Typology: Looking for Processes and Diversity in the Study of Lithic Technology in the Brazilian Amazon. *Journal of World Prehistory,* 23(3), 121-143.

Bullen, R. P., 1961. The archaeology of Grenada, West Indies, and the spread of ceramic people in the Antilles, in *First international Convention for the study of pre-Columbian culture in the Lesser Antilles. Fort-de-France, July 3 - 7, 1961*, eds. B. Marin & H. Theuvenin Fort-de-France: Société d'Histoire de la Martinique, 147-152.

Bullen, R. P., 1964. *The Archaeology of Grenada, West Indies.* Gainesville: University of Florida Press.

Bullen, R. P. & A. K. Bullen, 1973. Inferences from Cultural Diffusion to Tower Hill, Jamiaca, and Cupercoy Bay, St. martin, in *The Fifth International Congress for the Study of pre-Columbian Cultures from the Lesser Antilles*, ed. R. P. Bullen. Antigua: The Antigua National Trust & The Antigua Archaeological Society, 48-60.

Burke, K., 1988. Tectonic Evolution of the Caribbean. *Annual Review of Earth and Planetary Sciences,* 16, 201-230.

Burkhalter, E., 2012. Anexo 3: La geología del área y del emplazamiento de la excavación, in *El sitio arqueológico de Playa Grande, Río San Juan, María Trinidad Sánchez: Informe de las excavaciones arqueológicas campaña 2011 – 2012*, ed. A. J. López Belando. Santo Domingo: Museo del Hombre Dominicano.

Burroni, D. B., R. E. Donahue, A. M. Pollard & M. Mussi, 2002. The surface alteration features of flint artefacts as a record of environmental processes. *Journal of Archaelogical Science,* 29, 1277-1287.

Burström, N. M., 2014. Things in the Eye of the Beholder: A Humanistic Perspective on Archaeological Object Biographies. *Norwegian Archaeological Review,* 47(1), 65-82.

Burton, J., 1984. Quarrying in a tribal society. *World Archaeology,* 16(2), 234-247.

Burton, J., 1989. Repeng and the Salt-Makers: 'Ecological Trade' and Stone Axe Production in the Papua New Guinea Highlands. *MAN,* 24(2), 255-272.

Cadée, G. C. & F. P. Wesselingh, 2005. Van levend schelpdier naar fossiele schelp: tafonomie van Nederlandse strandschelpen. *Spirula,* 343, 36-52.

Callaghan, R. T., 2002. Comments on the Mainland Origins of the Preceramic Cultures of the Greater Antilles. *Latin American Antiquity*, 1-44.

Callaghan, R. T., 2007. The Question of the Aboriginal Use of Sails in the Circum-Caribbean Region, in *22nd conference of the International Association for Caribbean Archaeology.* Kingston, Jamaica, 1-14.

Callaghan, R. T., 2013. Archaeological views of seafaring in the Caribbean, in *The Oxford Handbook of Caribbean Archaeology*, eds. W. F. Keegan, C. L. Hofman & R. Rodríguez Ramos. Oxford: Oxford University Press, 283-295.

Caple, C., 2006. *Objects: Reluctant witnesses to the past.* London and New York: Routledge.

Cárdenas-Párraga, J., A. García-Casco, G. E. Harlow, I. F. Blanco-Quintero, Y. R. Agramonte & A. Kröner, 2012. Hydrothermal origin and age of jadeitites from Sierra del Convento Mélange (Eastern Cuba). *European Journal of Mineralogy,* 24(2), 313-331.

Cárdenas-Párraga, J., A. García-Casco, K. Núñez-Cambra, A. Rodríguez-Vega, I. F. Blanco-Quintero, G. E. Harlow & C. Lázaro, 2010. Jadeitite jade occurrence from the Sierra del Convento mélange (eastern Cuba). *Boletín de la Sociedad Geológica Mexicana,* 62, 199-205.

Carlson, L. A., 1993. Strings of command: Manufacture and utilization of shell beads among the Taino, in *15th International Congress for Caribbean Archaeology*, eds. R. E. Alegría & M. Rodríguez Lopez. San Juan: Centro de Estudios Avanzados de Puerto Rico y el Caribe, 97-109.

Carlsson, T., 2007. Axe production and axe relations, in *On The Road: Studies in honour of Lars Larsson*, eds. B. Hårdh, K. Jennbert & D. Olausson. Lunc: Almqvist & Wiksell International, 157-160.

Carneiro, R. L., 1974. On the use of the stone axe by the Amahuaca Indians of eastern Peru. *Ethnologische Zeitschrift Zürich,* 1, 107-122.

Carneiro, R. L., 1979a. Forest clearance among the Yanomamö, observations and implications. *Antropologica,* 52, 39-76.

Carneiro, R. L., 1979b. Tree felling with the stone ax: An experiment carried out among the Yanomamö Indians of Southern Venezuela, in *Ethnoarchaeology: Implications of ethnography for archaeology*, ed. C. Kramer. 21-58.

Carreras Rivery, R., 2009. *Las Maderas en los Objetos Aborígines Cubanos.* Ministerio de la Agricultura, Instituto de Investigaciones Forestales.

Carter, J. G., K. Bandel, V. de Buffrénil, S. J. Carlson, J. Castanet, M. A. Crenshaw, J. E. Dalingwater, H. Francillon-Vieillot, J. Géraudie, F. J. Meunier, H. Mutvei, A. Ricqlès, J. Y. de Sire, A. B. Smith, J. Wendt, A. Williams & L. Zylberberg, 1990. Glossary of Skeletal Biomineralization, in *Skeletal Biomineralisation: Patterns, Processes and Evolutionary Trends*, ed. J. G. Carter. New York: Van Nostrand Reinhold, 609-671.

Carter, J. G. & G. R. Clark II, 1985. Classification and phylogenetic significance of molluscan shell microstructure, in *Mollusks, Notes for a Short Course*, ed. T. W. Broadhead. University of Tennessee Department of Geological Sciences, 50-71.

Cartwright, C. R., 2018. Some methods for reconstructing the woody resources of Neolithic farmers in the Caribbean, in *The Archaeology of Caribbean and circum-Caribbean farmers 600 BC-AD 1500*, ed. B. A. Reid. London and New York: Routledge, 237-251.

Cartwright, C. R., P. L. Drewett & R. Ellmer, 1991. Material Culture II - Shell Artifacts, in *Prehistoric Barbados*, ed. P. L. Drewett. London & Barbados: Institute of Archaeology, University College London & Barbados Museum and Historical Society, 101-123.

Caruso Fermé, L., I. Clemente Conte, S. Beyries & M. T. Civalero, 2014. Wood technology of Patagonian hunter-gatherers: A use-wear analysis study from the site of Cerro Casa de Piedra 7 (Patagonia, Argentina), in *International Conference on Use-Wear Analysis: Use-Wear 2012*, eds. J. M. Marreiros, N. F. Bicho & J. F. Gibaja Bao. Newcastle: Cambridge Scholars Publishing, 342-351.

Caruso Fermé, L., I. Clemente & M. T. Civalero, 2015. A use-wear analysis of wood technology of patagonian hunter–gatherers. The case of Cerro Casa de Piedra 7, Argentina. *Journal of Archaeological Science,* 57, 315-321.

Casagrande, F., 2011. L'industrie lithique du site amérindien de Sainte-Rose - La Ramée, in *The 24th Congress of the International Association for Caribbean Archaeology*, ed. B. Bérard. Fort-de-France: Université des Antilles et de la Guyane, 220-239.

Castanha, T., 2011. *The myth of indigenous Caribbean extinction: continuity and reclamation in Boriken (Puerto Rico).* New York: Palgrave Macmillan.

Chacon, R. J. & D. H. Dye (eds.), 2007. *The Taking and Displaying of Human Body Parts as Trophies by*

Amerindians: Springer.

Chancerel, A., 2003. Haches polies en pierre du site Saladoïde Tardif de Tourlourous à Marie Galante, in *Twentieth International Congress for Caribbean Archaeology*, eds. C. Tavárez María & M. A. García Arévalo. Santo Domingo, Dominican Republic: Museo del Hombre Dominicano & Fundación García Arévalo, 144-150.

Chapman, J., 2000. *Fragmentation in archaeology. People, places and broken objects in the prehistory of south-eastern Europe.* London: Routledge.

Chapman, J. C. & B. I. Gaydarska, 2007. *Parts and Wholes: Fragmentation in prehistoric context.* Oxford: Oxbow Books.

Chapman, J. C., B. I. Gaydarska & J. Balen, 2012. Spondylus ornaments in the mortuary zone at Neolithic Vukovar on the Middle Danube. *Vjesnik Arheološkog muzeja u Zagrebu,* 3, 191-210.

Charlton, C. L. O. & A. Pastrana, 2017. Aztec Lapidaries, in *The Oxford Handbook of the Aztecs*, eds. D. L. Nichols & E. Rodríguez-Alegría. Oxford: Oxford University Press, 343-354.

Chateigner, D., C. Hedegaard & H. R. Wenk, 2000. Mollusc shell microstructures and crystallographic textures. *Journal of Structural Geology,* 22(11–12), 1723-1735.

Chaumeil, J.-P., 1997. Les os, les flûtes, les morts. Mémoire et traitement funéraire en Amazonie. *Journal de la Société des Américanistes,* 83(1), 83-110.

Chaumeil, J.-P., 2001. The Blowpipe Indians: Variations on the theme of blowpipe and tube among the Yagua Indians of the Peruvian Amazon, in *Beyond the Visible and the Material: The Amerindianization of society in the work of Peter Rivière*, eds. L. M. Rival & N. L. Whitehead. Oxford: Oxford University Press, 81-99.

Chaumeil, J.-P., 2007. Bones, flutes, and the dead: Memory and funerary treatments in Amazonia, in *Time and Memory in Indigenous Amazonia: Anthropological Perspectives*, eds. C. Fausto & M. J. Heckenberger. Gainesville: University Press of Florida, 243-283.

Chave, J., D. Coomes, S. Jansen, S. L. Lewis, N. G. Swenson & A. E. Zanne, 2009. Towards a worldwide wood economics spectrum. *Ecology Letters,* 12(4), 351-366.

Chen, H., H. Lian, J. Wang, X. Ding, M. Fang & Y.-M. Hou, 2017. Hafting wear on quartzite tools: An experimental case from the Wulanmulun Site, Inner Mongolia of north China. *Quaternary International,* 427, Part B, 184-192.

Choi, K. & D. Driwantoro, 2007. Shell tool use by early members of Homo erectus in Sangiran, central Java, Indonesia: cut mark evidence. *Journal of Archaeological Science,* 34, 48-58.

Choyke, A. M. & M. Daróczi-Szabó, 2010. The complete and usable tool: Some life histories of prehistoric bone tools in Hungary, in *Ancient and Modern Bone Artefacts from America to Russia: Cultural, Technological and Functional Signature*, eds. A. Legrand-Pineau & I. Sidéra. Oxford: Archaeopress, 235-248.

Christensen, M., T. Calligaro, S. Consigny, J. C. Dran, J. Salomon & P. Walter, 1998. Insight into the use wear mechanism of archaeological flints by implantation of a marker ion and PIXE analysis of experimental tools. *Nuclear Instruments and Methids in Physics Research, B.,* 136-138, 869-874.

Christensen, M., G. Grime, M. Menu & P. Walter, 1993. Usewear studies of flint tools with microPIXE and microRBS. *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms,* 77(1-4), 530-536.

Christensen, M., P. Walter & M. Menu, 1992. Usewear characterisation of prehistoric flints with IBA. *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms,* 64(1-4), 488-493.

Chu, W., C. Thompson & R. Hosfield, 2013. Micro-abrasion of flint artifacts by mobile sediments: a taphonomic approach. *Archaeological and Anthropological Sciences,* 7(1), 3-11.

Chudnoff, M., 1980. *Tropical Timbers of the World.* United States Department of Agriculture.

Ciofalo, A. J., W. F. Keegan, M. P. Pateman, J. R. Pagán-Jiménez & C. L. Hofman, 2018. Determining precolonial botanical foodways: starch recovery and analysis, Long Island, The Bahamas. *Journal of Archaeological Science: Reports,* 21, 305-317.

Claassen, C., 1998. *Shells.* Cambridge: Cambridge University Press.

Clarkson, C., Z. Jacobs, B. Marwick, R. Fullagar, L. Wallis, M. Smith, R. G. Roberts, E. Hayes, K. Lowe, X. Carah, S. A. Florin, J. McNeil, D. Cox, L. J. Arnold, Q. Hua, J. Huntley, H. E. A. Brand, T. Manne, A. Fairbairn, J. Shulmeister, L. Lyle, M. Salinas, M. Page, K. Connell, G. Park, K. Norman, T. Murphy & C. Pardoe, 2017. Human occupation of northern Australia by 65,000 years ago. *Nature,* 547(7663), 306-310.

Clement, C. R., W. M. Denevan, M. J. Heckenberger, A. B. Junqueira, E. G. Neves, W. G. Teixeira & W. I. Woods, 2015. The domestication of Amazonia before European conquest. *Proceedings of the Royal Society B: Biological Sciences,* 282(1812).

Clemente Conte, I., E. Boëda & M. Farias-Gluchy, 2017. Macro- and micro-traces of hafting on quartz tools from Pleistocene sites in the Sierra de Capivara in Piaui (Brazil). *Quaternary International,* 427, Part B, 206-210.

Clemente Conte, I. & J. F. Gibaja Bao, 2009. Formation of use-wear traces in non-flint rocks: the case of quartzite and rhyolite - Differences and similarities, in *Non-Flint Raw Material Use in Prehistory: Old prejudices and new directions*, eds. F. Sternke, L. Eigeland & L.-J. Costa. Oxford: Archaeopress, 93-98.

Clerc, E., 1973. Le travail du coquillage dans les sites Precolombiens de la Grande-Terre de Guadeloupe, in *The Fifth International Congress for the Study of pre-Columbian Cultures from the Lesser Antilles*, ed. R. P. Bullen. Antigua: The Antigua National Trust & The Antigua Archaeological Society, 127-132.

Cobb, C. R., 2003. Introduction: Framing stone tool traditions after contact, in *Stone tool traditions in the contact era*, ed. C. R. Cobb. Tuscaloosa and London: University of Alabama Press, 1-12.

Coccato, A., S. Karampelas, M. Wörle, S. van Willigen & P. Pétrequin, 2014. Gem quality and archeological green 'jadeite jade' versus 'omphacite jade'. *Journal of Raman Spectroscopy,* 45(11-12), 1260-1265.

Cody, A. K., 1989. From the site of Pearls, Grenada: Exotic lithics and radiocarbon dates, in *13th International Congress for Caribbean Archaeology*, eds. E. N. Ayubi & J. Haviser. Willemstad, Curaçao, 589-604.

Cody, A. K., 1990a. *Prehistoric patterns of exchange in the Lesser Antilles: Materials, models, and preliminary observations.* MA Ann Arbor: San Diego State University.

Cody, A. K., 1990b. Specialization, interaction, and exchange: A perspective from the Saladoid site of Pearls, Grenada, W.I., paper presented at the *55th Annual Meeting of the Society for American Archaeology, April 18-22, 1990,* Las Vegas.

Cody, A. K., 1991. Distribution of exotic stone artifacts through the Lesser Antilles: Their implications for prehistoric interaction and exchange, in *14th International Congress for Caribbean Archaeology*, eds. A. Cummins & P. King. Barbados: Barbados Museum and Historical Society, 204-226.

Cody, A. K. & T. J. Banks, 1988. *Progress report on the archaeological excavation at Pearls, August 1988.* Alpine, St George's: Submitted to the Grenada Ministry of Education.

Cody Holdren, A., 1998. *Raiders and Traders: Caraïbe Social and Political Networks at the Time of European Contact and Colonization in the Eastern Caribbean.* Ph.D. dissertation. Los Angeles: University of California, Anthropology.

Conrad, G. W., J. W. Foster & C. D. Beeker, 2001. Organic Artifacts from the Manantial de la Aleta, Dominican

Republic: preliminary observations and interpretations. *Journal of Caribbean Archaeology,* 2, 1-20.

Coomans, H. E., 1987. *Shell objects from Indian sites at Curaçao, Bonaire, and Aruba.* Bibliography of the Archaeology and the Amerindians of the Netherlands Antilles and Aruba.

Cooney, G., 2002. So many shades of rock. Colour symbolism and Irish stone axeheads, in *Colouring the past. The significance of colour in archaeological research*, eds. A. Jones & G. MacGregor. Oxford: Berg, 93-107.

Cooney, G., 2008. Engaging with stone. Making the Neolithic in Ireland and Western Britain, in *Between foraging and farming. An extended broad spectrum of papers presented to Leendert Louwe Kooijmans*, eds. H. Fokkens, B. Coles, A. L. Van Gijn, J. Kleijne, H. Ponjee & C. Slappendel. Leiden: Faculty of Archaeology, 203-214.

Cooney, G., 2015. Stone and flint axes in Neolithic Europe, in *The Oxford Handbook of Neolithic Europe*, eds. C. Fowler, J. Harding & D. Hofmann. Oxford: Oxford University Press, 515-534.

Cooney, G., G. Warren & T. Ballin, 2013. Island Quarries, Island Axeheads, and the Neolithic of Ireland and Britain. *North American Archaeologist,* 34(4), 409-431.

Cooper, J., 2010. Modelling mobility and exchange in pre-Columbian Cuba: GIS led approaches to identifying pathways and reconstructing journeys from the archaeological record. *Journal of Caribbean Archaeology,* 9(Special Publication #3), 122-137.

Cooper, J., M. Martinón-Torres & R. Valcárcel Rojas, 2008. American Gold and European Brass: Metal Objects and Indigenous Values in the Cemetery of El Chorro de Maíta, Cuba, in *Crossing the Borders: New methods and techniques in the study of archaeological materials from the Caribbean*, eds. C. L. Hofman, M. L. P. Hoogland & A. L. Van Gijn. Tuscaloosa: University of Alabama Press, 34-42.

Coppa, A., A. Cucina, M. L. P. Hoogland, M. Lucci, F. Luna Calderón, R. G. A. M. Panhuysen, G. Tavarez María, R. Valcárcel Rojas & R. Vargiu, 2008. New evidence of two different migratory waves in the circum-Caribbean area during the pre-Columbian period from the analysis of dental morphological traits, in *Crossing the Borders: New methods and techniques in the study of archaeological materials from the Caribbean*, eds. C. L. Hofman, M. L. P. Hoogland & A. L. Van Gijn. Tuscaloosa: University of Alabama Press, 195-213.

Costa, L. & C. Fausto, 2010. The Return of the Animists: Recent Studies of Amazonian Ontologies. 1(1), 89.

Costa Oliveira, T. L. d., 2017. Corpos Partidos: adornos cerimoniais, benzimentos rituais e a estética da produção no alto Rio Negro. *Mana,* 23, 37-76.

Coudreau, H. A., 1887. *La France Équinoxiale. Tome second: Voyage a travers les Guyanes et l'Amazonie.* Paris: Challemel.

Cresswell, R., 1983. Transferts de techniques et chaînes opératoires. *Techniques & Culture,* 2, 143-159.

Cresswell, R., 2003. Geste technique, fait social total. Le technique est-il dans le social ou face ʻa lui? *Techniques et culture,* 40, 1-21.

Crevaux, J., 1993. *Le mendiant de l'Eldorado de Cayenne aux Andes (1876-1879).* Paris: Édition Payot.

Cristiani, E., V. Dimitrijević & S. Vitezović, 2016. Fishing with lure hooks at the Late Neolithic site of Vinča – Belo Brdo, Serbia. *Journal of Archaeological Science,* 65, 134-147.

Cristiani, E., C. Lemorini & G. Dalmeri, 2012. Ground stone tool production and use in the Late Upper Palaeolithic: The evidence from Riparo Dalmeri (Venetian Prealps, Italy). *Journal of Field Archaeology,* 37(1), 34-50.

Cristiani, E., C. Lemorini, D. Saviola, S. A. Domingues & S. Nunziante Cesaro, 2008. Anchor axes: a case-study of wear traces analysis on ethno-archaeological stone tools from Brazil. An anthropological reflection on functional meaning, in *Prehistoric Technology' 40 years later: Functional Studies and the Russian Legacy.*

Proceedings of the International Congress Verona (Italy), 20-23 April 2005, eds. L. Longo & N. Skakun. Oxford: Archaeopress, 275-283.

Crock, J. G., 1995. The Forest North site and post-Saladoid settlement in Anguilla, in *16th International Congress for Caribbean Archaeology*, ed. G. Richard. Basse-Terre, Guadeloupe: Conseil Régional de la Guadeloupe et Auditorium de la Ville de Basse-Terre, 74-87.

Crock, J. G., 2000. *Interisland interaction and the development of chiefdoms in the Eastern Caribbean.* Ph.D. Dissertation. Pittsburgh: University of Pittsburgh, Faculty of Arts and Sciences.

Crock, J. G. & J. B. Petersen, 1999. *A Long and Rich Cultural Heritage: The Anguilla Archaeology Project, 1992-1998. A report prepared for the Anguilla Archaeological and Historical Society, The Valley, Anguilla, British West Indies.* The Valley: The Anguilla Archaeological and Historical Society.

Crock, J. G. & J. B. Petersen, 2004. Inter-island exchange, settlement hierarchy, and a Taino-related chiefdom on the Anguilla Bank, northern Lesser Antilles, in *Late Ceramic Age Societies in the Eastern Caribbean*, eds. A. Delpuech & C. L. Hofman. Oxford: Archaeopress, 139-156.

Crosby, E., 1977. An archaeologically oriented classification of ethnographic material culture, in *Stone Tools as Cultural Markers: Change, evolution and complexity*, ed. R. V. S. Wright. Canberra: Australian Institute of Aboriginal Studies, 83-96.

Cuenca Solana, D., I. Gutierrez Zugasti & I. Clemente Conte, 2011. The use of mollusc shells as tools by coastal human groups; the contribution of ethnographical studies to research on Mesolithic and early Neolithic technologies in northern Spain. *Journal of Anthropological Research,* 67, 77-101.

Curet, L. A., 2003. Issues on the Diversity and Emergence of Middle-Range Societies of the Ancient Caribbean: a Critique. *Journal of Archaeological Research,* 11(1), 1-42.

Curet, L. A., 2005. *Caribbean Paleodemography: Population, culture history, and sociopolitical processes in ancient Puerto Rico.* Tuscaloosa: University of Alabama Press.

Curet, L. A., 2014. The Taíno: Phenomena, Concepts, and Terms. *Ethnohistory,* 61(3), 467-495.

Curet, L. A. & M. W. Hauser, 2011. Introduction: Migration, seafaring, and Cultural Contact in the Caribbean, in *Islands at the Crossroads: Migration, Seafaring, and Interaction in the Caribbean*, eds. L. A. Curet & M. W. Hauser. Tuscaloosa: University of Alabama Press, 1-10.

Curet, L. A. & J. R. Oliver, 1998. Mortuary Practices, Social Development, and Ideology in Precolumbian Puerto Rico. *Latin American Antiquity,* 9(3), 217-239.

Curet, L. A., J. Torres & M. Rodríguez Lopez, 2004. Political and social history of Eastern Puerto Rico: the Ceramic Age, in *Late Ceramic Age Societies in the Eastern Caribbean*, eds. A. Delpuech & C. L. Hofman. Oxford: Archaeopress, 59-85.

Currey, J. D. & A. J. Kohn, 1976. Fracture in the crossed-lamellar structure of Conus shells. *Journal of Materials Science,* 11(9), 1615-1623.

Czichos, H., 1978. *Tribology: A Systems Approach to the Science and Technology of Friction, Lubrication, and Wear.* New York: Elsevier.

d'Errico, F., 1993. La vie sociale de l'art mobilier Paléolithique. Manipulation, transport, suspension des objets on os, bois de cervidés, ivoire. *Oxford Journal of Archaeology,* 12(2), 145-174.

d'Errico, F., C. Henshilwood, G. Lawson, M. Vanhaeren, A.-M. Tillier, M. Soressi, F. Bresson, B. Maureille, A. Nowell, J. Lakarra, L. Backwell & M. Julien, 2003. Archaeological Evidence for the Emergence of Language, Symbolism, and Music–An Alternative Multidisciplinary Perspective. *Journal of World Prehistory,* 17(1), 1-70.

d'Errico, F., P. Jardón Giner & B. Soler-Mayor, 1993. Critères à base expérimentale pour l'étude des perforations naturelles et intentionnelles sus coquillages, in *Traces et Fonction: Les gestes retrouvés. Actes du colloque international de Liège*, eds. P. C. Anderson, S. Beyries, M. Otte & H. Plisson. Liège: Édition ERAUL 50, 255-267.

d'Errico, F., V. Roux & Y. Dumond, 2000. Identification des techniques de finition des perles en calcédoine par l'analyse microscopique et rugosimétrique, in *Cornaline de l'Inde: Des pratiques techniques de Cambay aux techno-systèmes de l'Indus*, ed. V. Roux. Paris: Éditions de la Maison des sciences de l'homme, 97-169.

d'Errico, F. & P. Villa, 1997. Holes and grooves: the contribution of microscopy and taphonomy to the problem of art origins. *Journal of Human Evolution,* 33(1), 1-31.

d'Errico, F., P. Villa, A. C. Pinto Llona & R. Ruiz Idarraga, 1998. A Middle Palaeolithic origin of music? Using cave-bear bone accumulations to assess the Divje Babe I bone 'flute'. *Antiquity,* 27(275), 65-79.

Dacal Moure, R., 1997. The recurrent forms in Tanki Flip, in *The Archaeology of Aruba: The Tanki Flip site*, eds. A. H. Versteeg & S. Rostain. Aruba & Amsterdam: Archaeological Museum Aruba, 159-188.

Dacal Moure, R. & M. Rivero de la Calle, 1984. *Arqueologia aborigen de Cuba.* Havana: Editorial Gente Nueve.

Dacal Moure, R. & M. Rivero de la Calle, 1996. *Art and Archaeology of Pre-Columbian Cuba.* Pittsburgh: University of Pittsburgh Press, in collaboration with Ediciones Plaza, Havana.

Dacal Moure, R., R. Sampedro Hernandez & H. J. Kelly, 2004. Replication and Microscopy in the study of shell artefacts, in *The Archaeology of Aruba: The marine shell heritage*, eds. R. A. C. F. Dijkhoff & M. S. Linville. Oranjestad: Archaeological Museum of Aruba, 113-124.

Darwent, J., 1998. *The Prehistoric Use of Nephrite on the British Columbia Plateau.* Burnaby: Simon Fraser University Department of Archaeology Press.

Dauphin, Y. & A. Denis, 2000. Structure and composition of the aragonitic crossed lamellar layers in six species of Bivalvia and Gastropoda. *Comparative Biochemistry and Physiology Part A: Molecular & Integrative Physiology,* 126(3), 367-377.

David, N. & C. Kramer, 2001. *Ethnoarchaeology in Action.* Cambridge: Cambridge University Press.

Davis, D. D. & R. C. Goodwin, 1990. Island Carib Origins: Evidence and Nonevidence. *American Antiquity,* 55(1), 37-48.

de Goeje, C. H., 1910. Beiträge zur Völkerkunde von Surinam. *Intern. Archiv Ethnographie,* 19, 1-34.

De Léry, J., 1993 [1580]. *History of a Voyage to the Land of Brazil.* Berkeley: University of California Perss.

de Mille, C. N. & T. L. Varney, 2001. A preliminary investigation of Saladoid stone bead manufacture, in *19th International Congress for Caribbean Archaeology*, eds. L. Alofs & R. A. C. F. Dijkhoff. Palm Beach/Eagle Beach: Archaeological Museum Aruba, 43-55.

de Mille, C. N., T. L. Varney & M. H. J. Turney, 2008. Saladoid lapidary technology: New methods for investigating stone bead drilling techniques, in *Crossing the Borders: New methods and techniques in the study of archaeological materials from the Caribbean*, eds. C. L. Hofman, M. L. P. Hoogland & A. L. Van Gijn. Tuscaloosa: University of Alabama Press.

de Rochefort, C., 1666. *The History of the Caribby-Islands, viz. Barbados, St Christopher, St Vincents, Martinigo, Dominigo, Barbouthos, Monserrate, Mevis, Antego &c. in all XXVIII.* London: J.M.

de Waal, M. S., 2006. *Pre-Columbian Social Organisation and Interaction Interpreted through the Study of Settlement Patterns: An archaeological case-study of the Pointe des Châteaux, La Désirade and Les Îles de la Petite Terre micro-region, Guadeloupe, F.W.I.* Houten: Digital Printing Partners Utrecht BV.

de Zoeten, R. & P. Mann, 1991. Structural geology and Cenozoic tectonic history of the central Cordillera Septentrional, Dominican Republic. *Geological Society of America Special Papers,* 262, 265-280.

De Zoeten, R. & P. Mann, 1999. Cenozoic El Mamey Group of Nothern Hispaniola: A Sedimentary Record of Subduction, Collision and Strike-Slip Events Within the North America-Caribbean Plate Boundary Zone, in *Sedimentary Basins of the World: Caribbean Basins*, ed. P. Mann. Amsterdam: Elsevier, 247-286.

Deagan, K. & J. M. Cruxent, 2002. *Columbus's Outpost among the Taínos: Spain and America at La Isabela, 1493-1498.* New Haven & London: Yale University Press.

Debruyne, S., 2014. Stacks and sheets: The microstructure of nacreous shell and its merit in the field of archaeology. *Environmental Archaeology,* 19(2), 153-165.

deFrance, S. D. & L. A. Newsom, 2005. The Status of Paleoethnobiological Research on Puerto Rico and Adjacent Islands, in *Ancient Borinquen: Archaeology and ethnohistory of native Puerto Rico*, ed. P. E. Siegel. Tuscaloosa: University of Alabama Press, 122-184.

Del Bene, T. A., 1979. Once upon a striation: current models of striation and polish formation, in *Lithic Use-Wear Analysis*, ed. B. Hayden. New York and London: Academic Press, 167-177.

Delgado-Raack, S., D. Gómez-Gras & R. Risch, 2009. The mechanical propieties of macrolithic artifacts: a methodological background for functional analysis. *Journal of Archaelogical Science,* 36, 1823-1831.

Denevan, W. M., 1992. Stone vs. metal axes: The ambiguity of shifting cultivation in prehistoric Amazonia. *Journal of the Steward Anthropological Society,* 20, 153-165.

Denevan, W. M., 2001. *Cultivated Landscapes of Native Amazonia and the Andes.* Oxford: Oxford University Press.

Descola, P., 1996. Constructing natures: Symbolic ecology and social practice, in *Nature and Society. Anthropological Perspectives*, eds. P. Descola & G. Pálsson. London: Routledge, 82-102.

Descola, P., 2005. *Par-delà nature et culture.* Paris: Éditions Gallimard.

Descola, P., 2013. *Beyond Nature and Culture.* Chicago: The University of Chicago Press.

Desrosiers, S., 1991. Sur le concept de chaîne opératoire, in *Observer l'Action Technique: Des chaînes opératoires, pour quoi faire?*, ed. H. Balfet. Paris: Editions du CNRS, 21-25.

Devine, J. D., 1995. Petrogenesis of the basalt-andesite-dacite association of Grenada, Lesser Antilles island arc, revisited. *Journal of Volcanology and Geothermal Research,* 69(1), 1-33.

Diamond, G., 1979. The nature of so-called polished surfaces on stone artifacts, in *Lithic Use-Wear Analysis*, ed. B. Hayden. New York and London: Academic Press, 159-166.

Diehl, R. A. & E. G. Stroh, 1978. Tecali Vessel Manufacturing Debris at Tollan, Mexico. *American Antiquity,* 43(1), 73-79.

Dimitrijević, V. & B. Tripković, 2006. *Spondylus* and *Glycymeris* bracelets: trade reflections at Neolithic Vinča-Belo Brdo. *Documenta Praehistorica,* 33, 237-252.

Dobres, M.-A., 2000. *Technology and Social Agency.* Oxford: Blackwell.

Dobres, M.-A., 2009. Archaeologies of Technology. *Cambridge Journal of Economics,* 34, 103-114.

Dolan, J. F., P. Mann, R. de Zoeten, C. Heubeck, J. Shiroma & S. Monechi, 1991. Sedimentologic, stratigraphic, and tectonic synthesis of Eocene-Miocene sedimentary basins, Hispaniola and Puerto Rico, in *Geologic and Tectonic Development of the North America-Caribbean Plate Boundary in Hispaniola*, eds. P. Mann, G. Draper & J. F. Lewis. Boulder: Geological Society of America, 217-263.

Donahue, R. E. & D. B. Burroni, 2004. Lithic microwear analysis and the formation of archaeological assemblages, in *Lithics in Action: Papers from the conference Lithic Studies in the Year 2000*, eds. E. A. Walker, F. Wenban-Smith & F. Healy. Oxford: Oxbow Books, 140-148.

Draper, G., 1986. Blueschists and associated rocks in eastern Jamaica and their significance for Cretaceous plate-margin development in the northern Caribbean. *Geological Society of America Bulletin,* 97, 48-60.

Draper, G. & J. F. Lewis, 1991. Metamorphic belts in central Hispaniola. *Geological Society of America Special*

Papers, 262, 29-46.

Draper, G., P. Mann & J. F. Lewis, 1994. Chapter 7: Hispaniola, in *Caribbean Geology: An Introduction*, eds. S. K. Donovan & T. A. Jackson. Kingston: University of the West Indies, 129-150.

Draper, G., F. Nagle & P. R. Renne, 1991. Geology, structure, and tectonic development of the Rio San Juan Complex, northern Dominican Republic. *Geological Society of America Special Papers,* 262, 77-96.

Drewett, P. L. & C. R. Cartwright, 1991. Material Culture III - Stone Artifacts, in *Prehistoric Barbados*, ed. P. L. Drewett. London & Barbados: Institute of Archaeology, University College London & Barbados Museum and Historical Society, 124-133.

Drewett, P. L. & M. H. Harris, 1987. The archaeological survey of Barbados: 1985-87, in *Twelfth International Congress of the Association for Caribbean Archaeology*, ed. L. Sickler Robinson. Cayenne: A.I.A.C., 175-202.

Drewett, P. L., G. Rogers & L. A. Newsom, 2000. Economy and Subsistence II: Shellfish and Plant Remains, in *Prehistoric settlements in the Caribbean: Fieldwork in Barbados, Tortola and the Cayman Islands*, ed. P. L. Drewett. London: Archetype Publications, 155-165.

Du Tertre, J. B., 1973[1667-1671]. *Histoire Generale des Antilles: Habitées par les François, Tome II.* Fort-de-France: Éditions des Horizons Caraïbes.

Dubreuil, L., 2002. *Etude fonctionnelle des outils de broyage natoufiens: nouvelles perspectives sur l'émergence de l'agriculture au Proche-Orient.* Ph.D. dissertation. Bordeaux: Bordeaux I University, École doctorale de Geosciences et Sciences de l'Evironnement.

Dubreuil, L. & D. Savage, 2014. Ground stones: a synthesis of the use-wear approach. *Journal of Archaeological Science,* 48, 139-153.

Dubreuil, L., D. Savage, S. Delgado-Raack, H. Plisson, B. Stephenson & I. de la Torre, 2015. Current Analytical Frameworks for Studies of Use–Wear on Ground Stone Tools, in *Use-Wear and Residue Analysis in Archaeology*, eds. J. M. Marreiros, J. F. Gibaja Bao & N. Ferreira Bicho. Springer International Publishing, 105-158.

Duin, R. S., 2000/2001. A Wayana potter in the tropical rainforest of Surinam/French Guyana. *Newsletter of the Department of Pottery Technology,* 18/19, 45-58.

Dumont, J., 1982. The quantification of microwear traces: a new use for interferometry. *World Archaeology,* 14, 206-217.

Dunn, O. C. & J. E. jr. Kelley (eds.), 1989. *The Diario of Christopher Columbus's First Voyage to America 1492-1493. Abstracted by Fray Bartolomé de las Casas,* Norman and London: University of Oklahoma Press.

Dunnel, R. C., 1989. Diversity in Archaeology: a group of measures in seach of application, eds. R. D. Leonard & G. T. Jones. Cambridge.

Edmonds, M., 1995. *Stone Tools and Society. Working stone in Neolithic and Bronze Age Britain.* London: Batsford.

Edmonds, M., 2004. *The Langdales: Landscape and Prehistory in a Lakeland Valley.* Stroud: Tempus.

Epstein, S. R., 1998. Craft Guilds, Apprenticeship, and Technological Change in Preindustrial Europe. *The Journal of Economic History,* 58(3), 684-713.

Erikson, P., 2001. Myth and material culture: Matis blowguns, palm trees, and ancestor spirits, in *Beyond the Visible and the Material: The Amerindianization of society in the work of Peter Rivière*, eds. L. M. Rival & N. L. Whitehead. New York: Oxford University Press, 101-121.

Erikson, P., 2009. Obedient things: Reflections on the Matis theory of materiality, in *The Occult Life of Things: Native Amazonian theories of materiality and personhood*, ed. F. Santos-Granero. Tucson: The University of Arizona Press, 173-191.

Ernst, M. & C. L. Hofman, 2015. Shifting values: a study of Early European trade wares in the Amerindian site of El Cabo, eastern Dominican Republic, in *GlobalPottery 1. Historical Archaeology and Archaeometry for Societies in Contact*, eds. J. Buxeda i Garrigós, M. Madrid i Fernández & J. G. Iñañez. Oxford: Archaeopress, 195-204.

Escuder-Viruete, J., R. Friedman, M. Castillo-Carrión, J. Jabites & A. Pérez-Estaún, 2011. Origin and significance of the ophiolitic high-P mélanges in the northern Caribbean convergent margin: Insights from the geochemistry and large-scale structure of the Río San Juan metamorphic complex. *Lithos,* 127(3), 483-504.

Escuder-Viruete, J. & A. Pérez-Estaún, 2006. Subduction-related P–T path for eclogites and garnet glaucophanites from the Samaná Peninsula basement complex, northern Hispaniola. *International Journal of Earth Sciences,* 95(6), 995-1017.

Escuder-Viruete, J., P. Valverde-Vaquero, Y. Rojas-Agramonte, J. Gabites, M. Castillo-Carrión & A. Pérez-Estaún, 2013. Timing of deformational events in the Río San Juan complex: Implications for the tectonic controls on the exhumation of high-P rocks in the northern Caribbean subduction–accretionary prism. *Lithos,* 177(Supplement C), 416-435.

Esteban Deive, C., 2002. *Antlogía de la Flora y Fauna de Santo Domingo en Cronistas y Viajeros (Siglos XV-XX).* Santo Domingo: Amigo del Holgar.

Evans, A. A., 2014. On the importance of blind testing in archaeological science: the example from lithic functional studies. *Journal of Archaeological Science,* 48, 5-14.

Evans, A. A. & R. E. Donahue, 2005. The elemental chemistry of lithic microwear: an experiment. *Journal of Archaeological Science,* 32(12), 1733-1740.

Evans, A. A. & R. E. Donahue, 2008. Laser scanning confocal microscopy: a potential technique for the study of lithic microwear. *Journal of Archaeological Science,* 35(8), 2223-2230.

Evans, A. A. & D. Macdonald, 2011. Using metrology in early prehistoric stone tool research: further work and a brief instrument comparison. *Scanning,* 33(5), 294-303.

Evans, A. A., D. A. Macdonald, C. L. Giusca & R. K. Leach, 2014. New method development in prehistoric stone tool research: Evaluating use duration and data analysis protocols. *Micron,* 65, 69-75.

Falci, C. G., 2015a. Assembling all the beads: The production and use of Late Ceramic Age beads from northwestern Dominican Republic, in *26th Congress of the International Association for Caribbean Archaeology*, eds. C. B. Velasquez & J. B. Haviser. Maho, St. Martin: SIMARC.

Falci, C. G., 2015b. "Dusting off" the display case: Reassessing the potential of ornaments from private and museum collections for microwear analysis, in *AWRANA 2015. Connecting people and technologies*, eds. A. L. Van Gijn, B. Chan, G. H. J. Langejans, A. Sorensen, C. Tsoraki & A. Verbaas Leiden: Sidestone Press, 93.

Falci, C. G., 2015c. *Stringing beads together: A microwear study of bodily ornaments in late pre-Colonial north-central Venezuela and north-western Dominican Republic.* MA (Research) thesis. Leiden: Leiden University, Faculty of Archaeology.

Falci, C. G., M. M. Antczak, A. T. Antczak & A. L. Van Gijn, 2017a. Recontextualising bodily ornaments from north-central Venezuela (AD 900-1500): The Alfredo Jahn collection at the Ethnologisches Museum Berlin. *Baessler Archiv,* 64, 87-112.

Falci, C. G., J. Cuisin, A. Delpuech, A. Van Gijn & C. L. Hofman, 2018. New Insights into Use-Wear Development in Bodily Ornaments Through the Study of Ethnographic Collections. *Journal of Archaeological Method and Theory*.

Falci, C. G., A. Van Gijn, M. M. Antczak, A. T. Antczak & C. L. Hofman, 2017b. Challenges for microwear analysis of figurative shell ornaments from pre-Colonial Venezuela. *Journal of Archaeological Science: Reports,* 11, 115-130.

Falci, C.G., A.C.S. Knaf, A. Van Gijn, G.R. Davies & C.L. Hofman, in prep. Lapidary production and circulation in the eastern Caribbean: an integrated study of the site of Pearls, Grenada. Submitted manuscript.

Fandrich, J. E., 1989a. *Appendix I. Subsistence at Pearls, Grenada, W.I. (A.D. 200).* Alpine & St George's: Submitted to the Grenada Ministry of Education.

Fandrich, J. E., 1989b. Stone implements from Grenada: Where they trade items?, in *13th International Congress for Caribbean Archaeology*, eds. E. N. Ayubi & J. Haviser. Willemstad, Curaçao, 162-166.

Faulks, N. R., L. R. Kimball, N. Hidjrati & T. S. Coffey, 2011. Atomic force microscopy of microwear traces on Mousterian tools from Myshtylagty Lagat (Weasel Cave), Russia. *Scanning,* 33(5), 304-315.

Febles, J., 1988. *Manual para el Estudio de la Piedra Tallada de los Aborígenes de Cuba.* La Habana: Editorial Academia.

Fenn, T. R., 2015. A Review of Cross-craft Interactions Between the Development of Glass Production and the Pyrotechnologies of Metallurgy and other Vitreous Materials. *Cambridge Archaeological Journal,* 25(1), 391-398.

Ferguson, J., 2008. The when, where, and how of novices in craft production. *Journal of Archaeological Method and Theory,* 15(1), 51-67.

Ferguson, R. B., 1998. Whatever happened to the stone age? Steel tools and Yanomami historical ecology, in *Advances in Historical Ecology*, ed. W. Balée. New York: Columbia University Press.

Fernández González, C., 2016. The Chaîne Opératoire of the Flint Axes of the Myky Indigenous Tribe (Mato Grosso, Brazil). *Lithic Technology,* 41(3), 181-193.

Fewkes, J. W., 1904. *Porto Rican Stone Collars and Tripointed Idols.* Washington: The Smithsonian Institute.

Fewkes, J. W., 1922. *A Prehistoric Island Culture Area of America.* 34th Annual report of the Bureau of Americas Ethnology 1912-1913.

Finch, G. I., 1936. The Beilby Layer on Non-Metals. *Nature,* 138, 1010.

Fisher, J. W., 1995. Bone surface modifications in zooarchaeology. *Journal of Archaeological Method and Theory,* 2(1), 7-68.

Fitzpatrick, S. M., 2006. A Critical Approach to 14C Dating in the Caribbean: Using Chronometric Hygiene to Evaluate Chronological Control and Prehistoric Settlement. *Latin American Antiquity,* 17(4), 389-418.

Fitzpatrick, S. M., 2013. Seafaring Capabilities in the Pre-Columbian Caribbean. *Journal of Maritime Archaeology,* 8(1), 101-138.

Fitzpatrick, S. M., M. Kappers, Q. Kaye, C. M. Giovas, M. J. LeFebvre, M. H. Harris, S. Burnett, J. A. Pavia, K. Marsaglia & J. Feathers, 2009. Precolumbian Settlements on Carriacou, West Indies. *Journal of Field Archaeology,* 34(3), 247-266.

Fleischli, F. D., M. Dietiker, C. Borgia & R. Spolenak, 2008. The influence of internal length scales on mechanical properties in natural nanocomposites: A comparative study on inner layers of seashells. *Acta Biomaterialia,* 4(6), 1694-1706.

Fogelin, L. & M. B. Schiffer, 2015. Rites of Passage and Other Rituals in the Life Histories of Objects. *Cambridge Archaeological Journal,* 25(04), 815-827.

Fontijn, D. R., 2002. *Sacrificial landscapes. Cultural biographies of persons, objects and "natural" places in the Bronze Age of the Southern Netherlands, c. 2300-600 BC.* Leiden: Faculty of Archaeology, Leiden University.

Fontijn, D. R., 2013. Cultural biographies and itineraries of things: second thoughts, in *Mobility, meaning and transformations of things: Shifting contexts of material culture through time and space*, eds. H.-P. Hahn & H.

Weiss. Oxford: Oxbow books, 183-196.

Forest Products Laboratory, 2010. *Wood Handbook: Wood as an Engineering Material, Centennial edition.* Madison: United States Department of Agriculture, Forest Service, Forest Products Laboratory.

Forte, M. C. (ed.) 2006. *Indigenous resurgence in the contemporary Caribbean: Amerindian survival and revival,* New York: Peter Lang.

Foshag, W. F., 1957. Mineralogical studies on Guatemalan jade (with four plates). *Smithsonian Miscellaneous Collections,* 135(5).

Françozo, M., 2012. 'Dressed like an Amazon': The transatlantic trajectory of a red feather coat, in *Museums and Biographies: Stories, objects, identities*, ed. K. Hill. London: Boydell and Brewer, 187-199.

Françozo, M., 2016. Beyond the Kunstkammer: Brazilian Featherwork in Early Modern Europe, in *The Global Lives of Things: The Material Culture of Connections in the Early Modern World*, eds. A. Gerritsen & G. Riello. New York: Routledge, 105-127.

Fraser, A., 2014. Revisiting the Carib Story. *Caribbean Quarterly,* 60(2), 53-64.

Fredericksen, C. F. K. & B. Sewell, 1991. The reliability of flaked tool function studies in New Zealand archaeology. *Archaeology in Oceania,* 26(3), 123-126.

French, C. D. & C. J. Schenk, 2004. *Open-File Report 97-470-K (Map Showing Geology, Oil and Gas Fields, and Geologic Provinces of the Caribbean Region).* Denver: U.S. Geological Survey.

Frieman, C. J., P. J. Piper, K. T. K. Nguyen, T. K. Q. Tran & M. Oxenham, 2017. Rach Nui: ground stone technology in coastal Neolithic settlements of southern Vietnam. *Antiquity,* 91(358), 933-946.

Fullagar, R. L. K., 1991. The role of silica in polish formation. *Journal of Archaeological Science,* 18(1), 1-24.

Gabriel, J. M., 1981. Differing resistance of various mollusc shell materials to simulated whelk attack. *Journal of Zoology,* 194(3), 363-369.

Gaertner, L. M., 1994. Determining the Function of Dalton Adzes from Northeast Arkansas. *Lithic Technology,* 19(2), 97-109.

García-Casco, A., J. Cárdenas Párraga, A. Rodríguez Vega, K. Núñez Cambra & G. E. Harlow, 2009a. *Cuban Jade*. http://www.ugr.es/~agcasco/igcp546/ >> Carib Met Geol >> Jade.

García-Casco, A., S. Knippenberg, R. Rodríguez Ramos, G. E. Harlow, C. L. Hofman, J. C. Pomo & I. F. Blanco-Quintero, 2013. Pre-Columbian jadeitite artifacts from the Golden Rock Site, St. Eustatius, Lesser Antilles, with special reference to jadeitite artifacts from Elliot's, Antigua: implications for potential source regions and long-distance exchange networks in the Greater Caribbean. *Journal of Archaeological Science,* 40(8), 3153-3169.

García-Casco, A., J. C. Pomo González, I. F. Blanco-Quintero, R. Rodríguez Ramos, S. Knippenberg & G. E. Harlow, 2011. Petrological and geochemical characterization of pre-Columbian jadeitite artifacts from Dominican Republic, Puerto Rico, Guadeloupe and St. Eustatius. Implications for potential source regions and pan-regional trade dynamics in the Caribbean/Meso America/Northern South America region, in *Jade in the Caribbean Meeting* Leiden.

García-Casco, A., A. Rodríguez Vega, J. Cárdenas Párraga, M. A. Iturralde-Vinent, C. Lázaro, I. Blanco Quintero, Y. Rojas Agramonte, A. Kröner, K. Núñez Cambra, G. Millán, R. L. Torres-Roldán & S. Carrasquilla, 2009b. A new jadeitite jade locality (Sierra del Convento, Cuba): first report and some petrological and archeological implications. *Contributions to Mineralogy and Petrology,* 158(1), 1-16.

Gassón, R. A., 2000. Quirípas and Mostacillas: The Evolution of Shell Beads as a Medium of Exchange in Northern South America. *Ethnohistory,* 47(3-4), 581-609.

Gaydarska, B. I., J. C. Chapman, I. Angelova, M. Gurova & S. Yanev, 2004. Breaking, making and trading :

the Omurtag Eneolithic Spondylus hoard. *Archaeologia Bulgarica,* 8(2), 11-33.

Gell, A., 1998. *Art and Agency: An Anthropological Theory.* New York: Clarendon.

Genaro, J. A., 2008. Origins, composition and distribution of the bees of Cuba (Hymenoptera: Apoidea: Anthophila). *Insecta Mundi,* 52, 1-16.

Geneste, J.-M., B. David, H. Plisson, J.-J. Delannoy & F. Petchey, 2012. The Origins of Ground-edge Axes: New Findings from Nawarla Gabarnmang, Arnhem Land (Australia) and Global Implications for the Evolution of Fully Modern Humans. *Cambridge Archaeological Journal,* 22(1), 1-17.

Gentner, D. & K. J. K. Holyoak, B.N. (eds.), 2001. *The Analogical Mind: Perspectives from cognitive science,* Cambridge and London: MIT Press.

Geurds, A. & L. v. Broekhoven (eds.), 2013. *Creating Authenticity: Authentication processes in ethnographic museums,* Leiden: Sidestone Press.

Gilhooly, B., 2012. *Neither rough nor tuff; an experimental approach to understanding the durability of prehistoric shale axes.* MA thesis. Dublin: University College Dublin.

Gillings, M. & J. Pollard, 1999. Non-Portable Stone Artifacts and Contexts of Meaning: The Tale of Grey Wether (www.museums.ncl.ac.uk/Avebury/stone4.htm). *World Archaeology,* 31(2), 179-193.

Gillings, M. & J. Pollard, 2016. Making Megaliths: Shifting and Unstable Stones in the Neolithic of the Avebury Landscape. *Cambridge Archaeological Journal,* 26(4), 537-559.

Giovas, C. M., 2017. Continental connections and insular distributions: Deer bone artifacts of the precolumbian West Indies—A review and synthesis with new records. *Latin American Antiquity*, 1-17.

Giovas, C. M., 2018. The Beasts At Large – Perennial Questions and New Paradigms for Caribbean Translocation Research. Part II: Mammalian Introductions in Cultural Context. *Environmental Archaeology*, 1-12.

Giovas, C. M., M. J. LeFebvre & S. M. Fitzpatrick, 2012. New records for prehistoric introduction of Neotropical mammals to the West Indies: evidence from Carriacou, Lesser Antilles. *Journal of Biogeography,* 39(3), 476-487.

Gladfelter, E. H., 2007. Skeletal development in Acropora palmata (Lamarck 1816): a scanning electron microscope (SEM) comparison demonstrating similar mechanisms of skeletal extension in axial versus encrusting growth. *Coral Reefs,* 26(4), 883-892.

Glazier, S. D., 1989. Impressions of Aboriginal Technology: The Caribbean Canoe, in *13th International Congress for Caribbean Archaeology*, eds. E. N. Ayubi & J. Haviser. Willemstad, Curaçao, 149-161.

Godelier, M. *The Enigma of the Gift*. Chicago: University of Chicago Press.

Goeldi, E. A., 1906. Über den Gebrauch der Steinaxt bei jetzt lebenden Indianern Südamerikas, speziell Amazoniens. *Internationaler Amerikanisten-Kongress. Vierzehnte Tagung, Stuttgart 1904,* 2, 441-444.

Golding-Frankson, D. T., 2009. Jamaican Taíno 'Shellsmithing' Techniques Explored: A Study in Method. *Caribbean Quarterly,* 55(2), 43-63.

González, J. L. & J. R. Hinthorne, 2017. The Morrosquillo Assemblage Revealed: Provenance and Context of a Refined Group of Ground-edge Stone Tools from the Caribbean Lowlands of Colombia. *Lithic Technology*, 1-12.

González-Ruibal, A., A. Hernando & G. Politis, 2011. Ontology of the self and material culture: Arrow-making among the Awá hunter–gatherers (Brazil). *Journal of Anthropological Archaeology,* 30(1), 1-16.

González Urquijo, J., S. Beyries & J. J. Ibáñez Estévez, 2015. Ethnoarchaeology and Functional Analysis, in *Use-Wear and Residue Analysis in Archaeology*, eds. J. M. Marreiros, J. F. Gibaja Bao & N. Ferreira Bicho. Springer International Publishing, 27-40.

González Urquijo, J. E. & J. J. Ibáñez Estévez, 2003. The Quantification of Use-Wear Polish Using Image

Analysis. First Results. *Journal of Archaeological Science,* 30, 481-489.

Goodrum, M. R., 2008. Questioning Thunderstones and Arrowheads: The Problem of Recognizing and Interpreting Stone Artifacts in the Seventeenth Century. *Early Science and Medicine,* 13(5), 482-508.

Gosden, C. & L. Malafouris, 2015. Process archaeology (P-Arch). *World Archaeology,* 47(5), 701-717.

Gosden, C. & Y. Marshall, 1999. The cultural biography of objects. *World Archaeology,* 31(2), 169-178.

Gosselain, O. P., 1992. Technology and Style: Potters and Pottery Among Bafia of Cameroon. *MAN,* 27(3), 559-586.

Gosselain, O. P., 2000. Materializing Identities: An African Perspective. *Journal of Archaeological Method and Theory,* 7(3), 187-217.

Gosselain, O. P., 2016. To hell with ethnoarchaeology! *Archaeological Dialogues,* 23(2), 215-228.

Gould, R. A., 1980. *Living Archaeology.* Cambridge: Cambridge University Press.

Gould, R. A. & P. J. Watson, 1982. A dialogue on the meaning and use of analogy in Ethno-archaeological reasoning. *Journal of Anthropological Archaeology,* 1, 355-361.

Grace, R., 1989. *Interpreting the Function of Stone Tools: The Quantification and Computerization of Microwear Analysis.* Oxford: Archaeopress.

Grace, R., 1990. The limitations and applications of Use Wear Analysis, in *The Interpretative Possibilities of Microwear Studies. Proceedings of the international conference on lithic use-wear analysis, 15th-17th February 1989 in Uppsala, Sweden*, eds. B. Gräslund, H. Knutsson, K. Knutsson & J. Taffinder. Uppsala: Societas Archaeologica Upsaliensis, 9-14.

Grace, R., 1993. New methods in use-wear analysis, in *Traces et Fonction: Les gestes retrouvés. Actes du colloque international de Liège*, eds. P. C. Anderson, S. Beyries, M. Otte & H. Plisson. Liège: Édition ERAUL 50, 385-387.

Grace, R., I. D. G. Graham & M. H. Newcomer, 1985. The quantification of microwear polishes. *World Archaeology,* 17(1), 112-120.

Grace, R., I. D. G. Graham & M. H. Newcomer, 1987. Preliminary investigation into the quantification of wear traces on flint tools, in *The Human Uses of Flint and Chert: Proceedings of the fourth international flint symposium held at Brighton Polytechnic 10-15 April 1983*, eds. G. d. G. Sieveking & M. H. Newcomer. Cambridge: Cambridge University Press, 63-69.

Graeber, D., 2001. *Towards and anthropological theory of value: The false coin of our own dreams.* New York: Palgrave.

Granberry, J., 2013. Indigenous Languages of the Caribbean, in *The Oxford Handbook of Caribbean Archaeology*, eds. W. F. Keegan, C. L. Hofman & R. Rodríguez Ramos. Oxford: Oxford University Press, 61-69.

Granberry, J. & G. S. Vescelius, 2004. *Languages of the Pre-Columbian Antilles.* Tuscaloosa: University of Alabama Press.

Graziano, S., 2013. *The Worked Bone Assemblage of Hardinxveld-Giessendam, a Late Mesolithic site of the Dutch Wetlands* MA (Research) thesis. Leiden: Leiden University, Faculty of Archaeology.

Greenfield, H. J., 1999. The Origins of Metallurgy: Distinguishing Stone from Metal Cut-marks on Bones from Archaeological Sites. *Journal of Archaeological Science,* 26(7), 797-808.

Greenfield, H. J., 2002. Distinguishing metal (steel and low-tin bronze) from stone (flint and obsidian) tool cut marks on bone: An experimental approach, in *Experimental Archaeology. Replicating past objects, behaviours, and processes*, ed. J. R. Mathieu. Oxford: Archaeopress, 35-54.

Greenfield, H. J., 2006. Slicing Cut Marks on Animal Bones: Diagnostics for Identifying Stone Tool Type and Raw Material. *Journal of Field Archaeology,* 31(2), 147-163.

Griffith, S. J., C. E. L. Thompson, T. J. U. Thompson & R. L. Gowland, 2016. Experimental abrasion of water submerged bone: The influence of bombardment by different sediment classes on microabrasion rate. *Journal of Archaeological Science: Reports,* 10, 15-29.

Groman-Yaroslavski, I. & D. E. Bar-Yosef Mayer, 2015. Lapidary technology revealed by functional analysis of carnelian beads from the early Neolithic site of Nahal Hemar Cave, southern Levant. *Journal of Archaeological Science,* 58, 77-88.

Groot de Mahecha, A. M., 1992. *Checua: Una secuencia cultural entre 8500 y 3000 años antes del presente.* Santafe de Bogota: Fundación de Investigaciones Arqueológicas Nacionales.

Grouard, S., 1995. The fauna of the Tanki flip site- Aruba, in *16th International Congress for Caribbean Archaeology*, ed. G. Richard. Basse-Terre, Guadeloupe: Conseil Régional de la Guadeloupe et Auditorium de la Ville de Basse-Terre, 180-206.

Grouard, S., S. Perdikaris & K. Debue, 2013. Dog burials associated with Human burials in the West Indies during the early pre-Columbian Ceramic Age (500 BC-600 AD). *Anthropozoologica,* 48(2), 447-465.

Guerra, M. F., 2008. Archaeometry and museums: Fifty years of curiosity and wonder. *Archaeometry,* 50(6), 951-967.

Gwinnett, A. J. & L. Gorelick, 1979. Ancient lapidary. A study using Scanning Electron Microscopy and functional analysis. *Expedition,* 22(1), 17-32.

Gwinnett, A. J. & L. Gorelick, 1989. Evidence for mass production polishing in ancient bead manufacture. *Archaeomaterials,* 3, 163-168.

Hahn, H. P. & H. Weiss, 2013. Introduction: biographies, travels and itineraries of things, in *Mobility, meaning & transformations of things, shifting contexts of material culture through time and space*, eds. H. P. Hahn & H. Weiss. Oxford: Oxbow books, 1-14.

Halbmayer, E., 2012a. Amerindian mereology: Animism, analogy, and the multiverse. *Indiana,* (29), 103-125.

Halbmayer, E., 2012b. Debating animism, perspectivism and the construction of ontologies. *Indiana,* (29), 9-23.

Hall, S. M., 1978. Sanate Abajo: Monticulo E, Pozo H: Estudios de los restos biologicos y materiales asociados. *Boletín del Museo del Hombre Dominicano,* 10, 99-124.

Hamon, C., 2008. Functional analysis of stone grinding and polishing tools from the earliest Neolithic of north-western Europe. *Journal of Archaeological Science,* 35(6), 1502-1520.

Hamon, C. & H. Plisson, 2008. Functional analysis of grinding stones: the blind-test contribution, in *Prehistoric Technology' 40 years later: Functional Studies and the Russian Legacy. Proceedings of the International Congress Verona (Italy), 20-23 April 2005*, eds. L. Longo & N. Skakun. Oxford: Archaeopress, 29-38.

Hanna, J. A., 2017. *The Status of Grenada's Prehistoric Sites: Report on the 2016 Survey and an Inventory of Known Sites.* Botanical Gardens, Grenada: Ministry of Tourism.

Hansford, S. H., 1950. *Chinese Jade Carving.* London and Bradford: Lund Humphries.

Harding, P., P. L. Gibbard, J. Lewin, M. G. Macklin & E. H. Moss, 1987. The transport and abrasion of flint handaxes in a gravel-bed river, in *The Human Uses of Flint and Chert: Proceedings of the fourth international flint symposium held at Brighton Polytechnic 10-15 April 1983*, eds. G. d. G. Sieveking & M. H. Newcomer. Cambridge: Cambridge University Press, 115-126.

Hardy, M. D., 2008. *Saladoid Economy and Complexity on the Arawakan Frontier.* Ph.D. dissertation. Gainesville: Florida State University, Department of Anthropology.

Harlow, G. E., 1994. Jadeitites, albitites and related rocks from the Motagua Fault Zone, Guatemala. *Journal of Metamorphic Geology,* 12(1), 49-68.

Harlow, G. E., A. R. Murphy, D. J. Hozjan, C. N. d. Mille & A. A. Levinson, 2006. Pre-Colombian Jadeite axes from Antigua, West Indies: Description and possible sources. *the Canadian Mineralogist*.

Harlow, G. E., V. B. Sisson & S. S. Sorensen, 2011. Jadeitite from Guatemala : new observations and distinctions among multiple occurrences *Geologica Acta,* 9(3-4), 363-387.

Harlow, G. E. & S. S. Sorensen, 2005. Jade (Nephrite and Jadeitite) and Serpentinite: Metasomatic Connections. *International Geology Review,* 47(2), 113-146.

Harlow, G. E., T. Tsujimori & S. S. Sorensen, 2015. Jadeitites and plate tectonics. *Annual Reviews in Earth Planetary Sciences,* 43, 105-138.

Harmanşah, Ö., 2015. ISIS, Heritage, and the Spectacles of Destruction in the Global Media. *Near Eastern Archaeology,* 78(3), 170-177.

Hauser, M. W. & L. A. Curet, 2011. Islands at the Crossroads: archaeology of interaction in the Caribbean, in *Islands at the Crossroads: Migration, Seafaring, and Interaction in the Caribbean*, eds. L. A. Curet & M. W. Hauser. Tuscaloosa: University of Alabama Press, 219-232.

Haviser, J. B., 1991. Development of a Prehistoric Interaction Sphere in the Northern Lesser Antilles. *Nieuwe West Indische Gids,* 65(3-4), 129-151.

Haviser, J. B., 1993. Test excavations at the Savonet rock paintings site, Curaçao, in *15th International Congress for Caribbean Archaeology*, eds. R. E. Alegría & M. Rodríguez Lopez. San Juan: Centro de Estudios Avanzados de Puerto Rico y el Caribe, 571-580.

Haviser, J. B., 1997. Settlement strategies in the Early Ceramic Age, in *The Indigenous People of the Caribbean*, ed. S. M. Wilson. Gainesville: University Press of Florida, 59-69.

Haviser, J. B., 1999. Lithics, in *Archaeological investigations on St. Martin (Lesser Antilles): The sites of Norman Estate, Anse des Pères and Hope Estate with a contribution to the 'La Hueca problem'*, eds. C. L. Hofman & M. L. P. Hoogland. Leiden: Faculty of Archaeology, Leiden University, 189-202.

Hayes, E. H., D. Cnuts, C. Lepers & V. Rots, 2017. Learning from blind tests: Determining the function of experimental grinding stones through use-wear and residue analysis. *Journal of Archaeological Science: Reports,* 11, 245-260.

Hayes, E. H., C. Pardoe & R. Fullagar, 2018. Sandstone grinding/pounding tools: Use-trace reference libraries and Australian archaeological applications. *Journal of Archaeological Science: Reports,* 20, 97-114.

Haynes, G., 1983. A guide for differentiating mammalian carnivore taxa responsible for gnaw damage to herbivore limb bones. *Paleobiology,* 9(2), 164-172.

Heidegger, M., 1962. *Being and Time.* New York: Harper and Row.

Helms, M. W., 1987. Art styles and interaction spheres in Central America and the Caribbean: polished black wood in the Greater Antilles, in *Chiefdoms in the Americas*, eds. R. D. Drennan & C. A. Uribe. Lanham, New York, London: University Press of America, 67-83.

Henare, A., M. Holbraad & S. Wastell, 2007. Introduction: Thinking through things, in *Thinking Through Things: Theorising Artefacts Ethnographically*, eds. A. Henare, M. Holbraad & S. Wastell. London / New York: Routledge, 1-31.

Hernández, D. & C. Fuentes, 1985. *Los Fabricantes del Sonido.* Caracas: Editorial Binet.

Hernández Ramírez, G. E. & R. Izquierdo Díaz, 2011. Aerófonos y mitología caribeña. *Cuba Arqueológica,* 4(2), 26-32.

Herrera Fritot, R., 1964. *Estudio de las hachas Antillanas: Creacion de indices axiales para las petaloides.* La Habana: Departamento de Antropologia, Comisión nacional de la academia de sciencias.

Hertwig, A., 2014. *Genesis of jadeitites and their country rocks: Rio San Juan Complex, Dominican Republic.* Ph.D.

Dissertation. Bochum: Ruhr-Universität Bochum, Fakultät für Geowissenschaften.

Hertwig, A., W. C. McClelland, K. Kitajima, H.-P. Schertl, W. V. Maresch, K. Stanek, J. W. Valley & S. A. Sergeev, 2016. Inherited igneous zircons in jadeitite predate high-pressure metamorphism and jadeitite formation in the Jagua Clara serpentinite mélange of the Rio San Juan Complex (Dominican Republic). *Contributions to Mineralogy and Petrology,* 171(5), 48.

Hill, J. D., 2013. Instruments of Power: Musicalising the Other in Lowland South America. *Ethnomusicology Forum,* 22(3), 323-342.

Hill, J. D. & J.-P. Chaumeil (eds.), 2011a. *Burst of Breath: Indigenous ritual wind instruments in lowland South America,* Lincoln: University of Nebraska Press.

Hill, J. D. & J.-P. Chaumeil, 2011b. Overture, in *Burst of Breath: Indigenous ritual wind instruments in lowland South America*, eds. J. D. Hill & J.-P. Chaumeil. Lincoln: University of Nebraska Press, 1-46.

Hill, K. (ed.) 2012. *Museums and Biographies: Stories, objects, identities,* London: Boydell and Brewer.

Hirth, K. G. & S. G. Hirth, 1993. Ancient Currency: The Style and Use of Jade and Marble Carvings in Central Honduras, in *Pre-Colombian Jade: New Geological and Cultural Interpretations*, ed. F. W. Lange. Salt Lake City: University of Utah Press, 173-190.

Hirth, K. G., M. C. Serra Puche, J. C. Lazcano Arce & J. d. León, 2009. Intermittent Domestic Lapidary Production during the Late Formative Period at Nativitas, Tlaxcala, Mexico. *Archaeological papers of the american anthropological association,* 19(1), 157-173.

Hirvonen, J. P., R. Lappalainen, J. Koskinen, J. Likonen & M. Pekkarinen, 1993. Wear and Friction of Unio Crassus Shell in Dry Sliding Contact with Steel. *MRS Proceedings,* 330.

Hiscock, P., S. O'Connor, J. Balme & T. Maloney, 2016. World's earliest ground-edge axe production coincides with human colonisation of Australia. *Australian Archaeology,* 82(1), 2-11.

Hodder, I., 2011. Human-thing entanglement: towards an integrated archaeological perspective. *Journal of the Royal Anthropological Institute,* 17(1), 154-177.

Hodder, I., 2012. *Entangled; an archaeology of the relationships between humans and things.* Sussex: Wiley Blackwell.

Hodge, W. H. & D. Taylor, 1957. The ethnobotany of the Island Caribs of Dominica. *Webbia,* 12(2), 513-644.

Hoffman, C. R., 1999. Intentional damage as technological agency: breaking metals in late prehistoric Spain, in *The Social Dynamics of Technology: Practice, Politics, and World View*, eds. M.-A. Dobres & C. R. Hoffman. Washington: Smithsonian Institution Press, 103-123.

Hofman, C. L., 1995. Three Late Prehistoric Sites in the Periphery of Guadeloupe: Grande Anse, Les Saintes and Morne Cybele 1 and 2, La Desirade, in *Sixteenth International Congress for Caribbean Archaeology.* Guadeloupe, 156-163.

Hofman, C. L., 2013. The post-Saladoid in the Lesser Antilles (A.D. 600/800-1492), in *The Oxford Handbook of Caribbean Archaeology*, eds. W. F. Keegan, C. L. Hofman & R. Rodríguez Ramos. Oxford: Oxford University Press, 205-220.

Hofman, C. L., 2016. *Fieldwork Report from the work carried out at La Poterie, Grenada in January 2016 by the Faculty of Archaeology, Leiden University.* Leiden: Leiden University.

Hofman, C. L., 2017. *Fieldwork Report from the work carried out at La Poterie, Grenada in January 2017 by the Faculty of Archaeology, Leiden University.* Leiden: Leiden University.

Hofman, C. L., A. Boomert, A. J. Bright, M. L. P. Hoogland, S. Knippenberg & A. V. M. Samson, 2011. Ties with the homelands: Archipelagic interaction and the enduring role of the South and Central American mainlands in the pre-Columbian Lesser Antilles, in *Islands at the Crossroads: Migration, Seafaring, and*

Interaction in the Caribbean, eds. L. A. Curet & M. W. Hauser. Tuscaloosa: University of Alabama Press, 73-86.

Hofman, C. L., A. J. Bright, A. Boomert & S. Knippenberg, 2007. Island Rhythms: The Web of Social Relationships and Interaction Networks in the Lesser Antillean Archipelago between 400 B.C. and A.D. 1492. *Latin American Antiquity,* 18(3), 243-268.

Hofman, C. L., A. J. Bright, M. L. P. Hoogland & W. F. Keegan, 2008a. Attractive Ideas, Desirable Goods: Examining the Late Ceramic Age Relationships between Greater and Lesser Antillean Societies. *The Journal of Island and Coastal Archaeology,* 3(1), 17-34.

Hofman, C. L., A. J. Bright & R. Rodríguez Ramos, 2010. Crossing the Caribbean Sea: Towards a holistic view of pre-colonial mobility and exchange. *Journal of Caribbean Archaeology,* 9(Special Publication #3), 1-18.

Hofman, C. L. & E. B. Carlin, 2010. The ever-dynamic Caribbean: Exploring new approaches to unravelling social networks in the pre- colonial and early colonial periods, in *Linguistics and archaeology in the Americas: The historization of language and society*, eds. E. B. Carlin & S. Van De Kerke. Leiden: Brill, 107-122.

Hofman, C. L. & M. L. P. Hoogland, 2004. Social Dynamics and Change in the Northern Lesser Antilles, in *The Late Ceramic Age in the Eastern Caribbean*, eds. A. Delpuech & C. Hofman. Oxford: Archaeopress, 1-22.

Hofman, C. L. & M. L. P. Hoogland, 2011. Unravelling the multi-scale networks of mobility and exchange in the precolonial circum-Caribbean, in *Communities in Contact: Essays in archaeology, ethnohistory & ethnography of the Amerindian circum-Caribbean*, eds. C. L. Hofman & A. v. Duijvenbode. Leiden: Sidestone Press, 15-43.

Hofman, C. L. & M. L. P. Hoogland, 2012. Caribbean encounters: Rescue excavations at the early colonial Island Carib site of Argyle, St. Vincent, in *The End of Our Fifth Decade*, eds. C. C. Bakels & H. Kamermans. Leiden: Faculty of Archaeology, 63-76.

Hofman, C. L. & M. L. P. Hoogland, 2015a. Archaeological investigations along the Ruta de Colón: The sites of El Flaco (Loma de Gayacanes), La Luperona (Unijica) and El Carril (Laguna Salada), Dominican Republic, in *26th International Congress for Caribbean Archaeology*, ed. J. B. Haviser. Maho, St. Martin.

Hofman, C. L. & M. L. P. Hoogland, 2015b. Investigaciones arqueológicas en los sitios El Flaco (Loma de Guayacanes) y La Luperona (Unijica). Informe pre-liminar. *Boletín del Museo del Hombre Dominicano,* 46, 61-74.

Hofman, C. L. & M. L. P. Hoogland, 2016. Connecting Stakeholders: Collaborative preventive archaeology projects at sites affected by natural and/or human impacts. *Caribbean Connections,* 5(1), 1-31.

Hofman, C. L., M. L. P. Hoogland & J. R. Oliver, 2004. *A first reconnaissance of archaeological sites in the Dominican Republic. 13-07-2004 to 27-07-2004.* Museo del Hombre Dominicano, Leiden University, University College London.

Hofman, C. L., M. L. P. Hoogland, J. R. Oliver & A. V. M. Samson, 2006. Investigaciones arqueológicas en El Cabo, oriente de la República Dominicana: Resultados preliminaries de la campana de 2005. *El Caribe Arqueológico,* 9, 95-106.

Hofman, C. L., M. L. P. Hoogland & B. Roux, 2015. Reconstruire le táboüi, le manna et les pratiques funéraires au village caraïbe d'Argyle, Saint-Vincent, in À la recherche du Caraïbe perdu: Les populations amérindiennes des Petites Antilles de l'époque précolombienne à la période coloniale, ed. B. Grunberg. Paris: L'Harmattan, 41-50.

Hofman, C. L., M. L. P. Hoogland, A. V. M. Samson & J. R. Oliver, 2008b. Investigaciones arqueológicas en El Cabo, oriente de la República Dominicana: Resultados preliminaries de las campanas de 2005 y 2006.

Boletín del Museo del Hombre Dominicano, 42, 307-316.

Hofman, C. L., A. J. D. Isendoorn, M. A. Booden & L. F. H. C. Jacobs, 2008c. In tuneful threefold: Combining conventional archaeological methods, archaeometric techniques, and ethnoarchaeological research in the study of precolonial pottery of the Caribbean, in *Crossing the Borders: New methods and techniques in the study of archaeological material from the Caribbean*, eds. C. L. Hofman, M. L. P. Hoogland & A. L. Van Gijn. Tuscaloosa: University of Alabama Press, 21-33.

Hofman, C. L. & L. F. H. C. Jacobs, 2000/2001. The dynamics of technology, function, and style: A study of Early Ceramic Age pottery from the Caribbean. *Newsletter of the Department of Pottery Technology,* 18/19, 7-43.

Hofman, C. L., A. Mol, M. Hoogland & R. Valcárcel Rojas, 2014a. Stage of encounters: migration, mobility and interaction in the pre-colonial and early colonial Caribbean. *World Archaeology,* 46(4), 590-609.

Hofman, C. L., A. A. A. Mol, R. Rodríguez Ramos & S. Knippenberg, 2014b. Networks set in stone: Archaic-Ceramic interaction in the early prehistoric northeastern Caribbean, in *Archéologie Caraïbe*, eds. B. Bérard & C. Losier. Leiden: Sidestone Press, 119-132.

Hofman, C. L., R. Rodríguez Ramos & J. Pagán Jiménez, 2018a. The neolithisation of the northeastern Caribbean: mobility and social interaction, in *The Archaeology of Caribbean and Circum-Caribbean Farmers (6000 BC-AD 1500)*, ed. B. A. Reid. London and New York: Routledge, 71-97.

Hofman, C. L., J. Ulloa Hung, E. Herrera Malatesta, J. S. Jean, T. Sonnemann & M. L. P. Hoogland, 2018b. Indigenous Caribbean perspectives: archaeologies and legacies of the first colonised region in the New World. *Antiquity,* 92(361), 200-216.

Hofman, C. L., J. Ulloa Hung & M. L. P. Hoogland, 2016. El paisaje social indígena al momento del encuentro colonial: Nuevas investigaciones en el norte de la República Dominicana. *Boletín del Museo del Hombre Dominicano,* 47, 299-310.

Hofstadter, D. R., 2001. Epilogue: Analogy as the core of cognition, in *The Analogical Mind: Perspectives from cognitive science*, eds. D. Gentner & K. J. K. Holyoak, B.N. Cambridge and London: MIT Press.

Holbraad, M., 2009. Ontology, Ethnography, Archaeology: an Afterword on the Ontography of Things. *Cambridge Archaeological Journal,* 19(03), 431-441.

Holbraad, M., 2012. *Truth in Motion: The Recursive Anthropology of Cuban Divination.* Chicago: Chicago University Press.

Holbraad, M., M. A. Pedersen & E. B. Viveiros de Castro, 2014. The Politics of Ontology: Anthropological Positions. *Cultural Anthropology*.

Holmes, W. H., 1897. *Archaeological studies among the ancient cities of Mexico. Part II.* Chicago: Field Columbian Museum.

Holtorf, C. J., 1998. The life histories of megaliths in Mecklenburg-Vorpommern (Germany). *World Archaeology,* 30(1), 23-38.

Holtorf, C. J., 2002. Notes on the Life History of a Pot Sherd. *Journal of Material Culture,* 7(1), 49-71.

Honychurch, L., 1997. Crossroads in the Caribbean: a SIte of Encounter and Exchange on Dominica. *World Archaeology,* 28(3), 291-304.

Hoogland, M. L. P., 1996. *In search of the native population of pre-Columbian Saba (400-1450 A.D.). Part two. Settlements in their natural and social environment.* Ph.D. Dissertation. Leiden: Leiden University, Faculty of Archaeology.

Hoogland, M. L. P. & C. L. Hofman, 1999. Expansion of the Taino Cacicazgos towards the Lesser Antilles. *Journal de la Société des Américanistes,* 85, 93-113.

Hoogland, M. L. P. & C. L. Hofman, 2013. From corpse taphonomy to mortuary behavior in the Caribbean: A case study from the Lesser Antilles, in *The Oxford Handbook of Caribbean Archaeology*, eds. W. F. Keegan, C. L. Hofman & R. Rodríguez Ramos. Oxford: Oxford University Press, 452-469.

Hoogland, M. L. P., C. L. Hofman & A. Boomert, 2011. Argyle, St. Vincent: new insight into the Island Carib occupation of the Lesser Antilles, in *24th International Congress for Caribbean Archaeology.* Fort-de-France, Martinique, July 24th-30th.

Horsfall, G. A., 1987. Design Theory and Grinding Stones, in *Lithic Studies among the Contemporary Highland Maya*, ed. B. Hayden. Tucson: The University of Arizona Press, 332-377.

Hoskins, J., 1998. *Biographical objects: How things tell the story of people's lives.* London & New York: Routledge.

Hoskins, J., 2006. Agency, biography and objects, in *Handbook of Material Culture*, eds. C. Tilley, W. Keane, S. Küchler, M. Rowlands & P. Spyer. London: Sage, 74-84.

Hou, D. F., G. S. Zhou & M. Zheng, 2004. Conch shell structure and its effect on mechanical behaviors. *Biomaterials,* 25(4), 751-756.

Hugh-Jones, S., 2009. The fabricated body: Objects and ancestors in northwest Amazonia, in *The Occult Life of Things: Native Amazonian theories of materiality and personhood*, ed. F. Santos-Granero. Tucson: The University of Arizona Press, 33-59.

Hull, B. E., 2014. *Tracing Sources: The Procurement and Exchange of Ground-edge "Greenstone" artifacts of the Late Ceramic Age Site El Cabo, Dominican Republic.* MA Thesis. Leiden: Leiden University, Faculty of Archaeology.

Hulme, P. & N. L. Whitehead, 1992. *Wild Majesty: Encounters with Caribs from Columbus to the Present Day, An Anthology.* Oxford: Clarendon Press.

Hurcombe, L., 1988. Some criticisms and suggestions in response to Newcomer et al. (1986). *Journal of Archaeological Science,* 15(1), 1-10.

Hurcombe, L. M., 1997. The contribution of obsidian use–wear analysis to understanding the formation and alteration of wear, in *Siliceous rocks and culture*, eds. A. Ramos-Millán & M. A. Bustillo. Granada: Editorial Universidad de Granada, 487-497.

Ibáñez, J. J., J. E. González Urquijo & J. Gibaja, 2014. Discriminating wild vs domestic cereal harvesting micropolish through laser confocal microscopy. *Journal of Archaeological Science,* 48, 96-103.

Ibáñez, J. J. & J. E. González, 2003. Use-wear in the 1990s in Western Europe. Potential and limitations of a method, in *Lithic Analysis at the Millennium*, eds. N. Moloney & M. J. Shott. London: Institute of Archaeology, University College London, 163-172.

Ingold, T., 2007. Materials against materiality. *Archaeological Dialogues,* 14(1), 1-16.

Inizan, M.-L., M. Reduron-Ballinger, H. Roche & J. Tixier, 1999. *Technology and Terminology of Knapped Stone.* Nanterre: Cercle de Recherches et d'Etudes Préhistoriques.

Ionescu, C., C. Fischer, V. Hoeck & A. Lüttge, 2018. Discrimination of Ceramic Surface Finishing by Vertical Scanning Interferometry. *Archaeometry*, in press.

Izikowitz, K. G., 1935. *Musical and other sound instruments of the South American Indians: A comparative ethnographical study.* Göteborg: Elanders Boktryckeri Aktiebolag.

Jackson, A. P., J. F. V. Vincent & R. M. Turner, 1988. The Mechanical Design of Nacre. *Proceedings of the Royal Society of London. Series B. Biological Sciences,* 234(1277), 415.

Jackson, T. A. & S. K. Donovan, 1994. Tobago, in *Caribbean Geology: An introduction*, eds. S. K. Donovan & T. A. Jackson. Kingston: UWIPA, 193-207.

Jaime-Riverón, O., 2010. Olmec Greenstone in Early Formative Mesoamerica: Exchange and process of production. *Ancient Mesoamerica,* 21(1), 123-133.

Jardines Macías, J. E., A. Toppe Guerrero & J. Calvera Roses, 2013. La madera en la arqueología de Cuba. Los Buchillones. *Cuba Arqueológica,* 6(1), 9-29.

Jardines Macías, J. E., A. Toppe Guerrero & J. Calvera Roses, 2015. Los artefactos de madera del sitio Los Buchillones. Una coleccíon arqueológica de referencia. *Boletín del Museo del Hombre Dominicano,* 46, 141-175.

Jones, A., 2002. *Archaeological Theory and Scientific Practice.* Cambridge: Cambridge University Press.

Jones, A., 2004. Archaeometry and materiality: materials-based analysis in theory and practice*. *Archaeometry,* 46(3), 327-338.

Jones, R. C. & G. Uehara, 1973. Amorphous Coatings on Mineral Surfaces. *Soil Science Society of America Journal,* 37, 792-798.

Joordens, J. C. A., F. d'Errico, F. P. Wesselingh, S. Munro, J. de Vos, J. Wallinga, C. Ankjaergaard, T. Reimann, J. R. Wijbrans, K. F. Kuiper, H. J. Mucher, H. Coqueugniot, V. Prie, I. Joosten, B. van Os, A. S. Schulp, M. Panuel, V. van der Haas, W. Lustenhouwer, J. J. G. Reijmer & W. Roebroeks, 2015. Homo erectus at Trinil on Java used shells for tool production and engraving. *Nature,* 518(7538), 228-231.

Joy, J., 2009. Reinvigorating object biography: reproducing the drama of object lives. *World Archaeology,* 41(4), 540-556.

Joy, J., 2010. *Iron Age Mirrors: A Biographical Approach.* Oxford.

Joy, J., 2016. Hoards as collections: re-examining the Snettisham Iron Age hoards from the perspective of collecting practice. *World Archaeology*, 1-15.

Joyce, R. A., 2013. When is Authentic? Situating authenticity in the itineraries of objects, in *Creating Authenticity: Authentication processes in ethnographic museums*, eds. A. Geurds & L. v. Broekhoven. Leiden: Sidestone Press, 39-58.

Joyce, R. A., 2017. *Painted Pottery of Honduras: Object Lives and Itineraries.* Leiden: Brill.

Joyce, R. A. & S. D. Gillespie, 2015. Making things out of objects that move, in *Things in Motion: Object itineraries in anthropological practice*, eds. R. A. Joyce & S. D. Gillespie. Santa Fe: School for Advanced Research Press, 3-19.

Joyce, T. A., 1916. *Central American and West Indian Archaeology.* New York: G. P. Putnam's Sons.

Juel Jensen, H., 1988. Functional analysis of prehistoric flint tools by high-power microscopy. A review of West-European research. *Journal of World Prehistory,* 2, 53-88.

Kamat, S., H. Kessler, R. Ballarini, M. Nassirou & A. H. Heuer, 2004. Fracture mechanisms of the *Strombus gigas* conch shell: II-micromechanics analyses of multiple cracking and large-scale crack bridging. *Acta Materialia,* 52(8), 2395-2406.

Kamat, S., X. Su, R. Ballarini & A. H. Heuer, 2000. Structural basis for the fracture toughness of the shell of the conch *Strombus gigas*. *Nature,* 405(6790), 1036-1040.

Kamminga, J., 1977. A functional study of use-polished eloueras, in *Stone Tools as Cultural Markers: Change, evolution and complexity*, ed. R. V. S. Wright. Canberra: Australian Institute of Aboriginal Studies, 205-212.

Kamminga, J., 1979. The nature of use-polish and abrasive smoothing on stone tools, in *Lithic Use-Wear Analysis*, ed. B. Hayden. New York and London: Academic Press, 136-140.

Kaplan, J. M. & S. Patch, 2014. *Volume II, part 7: The lithic artifacts of Jácana.* Stone Mountain: New South Associates.

Kasper, D. C. & D. K. Larue, 1986. Paleogeographic and tectonic implications of quartzose sandstones of

Barbados. *Tectonics,* 5(6), 837-854.

Kästner, K.-P., 2007. *Zoé: Materielle Kultur, Brauchtum und kulturgeschichtliche Stellung eines Tupí-Stammes in Norden Brasiliens.* Berlin: VWB - Verlag für Wissenschaft und Bildung.

Kato, K., 2002. Classification of wear mechanisms/models. *Proceedings of the Institution of Mechanical Engineers, Part J: Journal of Engineering Tribology,* 216(6), 349-355.

Kato, K., 2005. Classification of wear mechanisms/models, in *Wear: Materials, Mechanisms and Practice*, ed. G. W. Stachowiak. West Sussex: John Wiley & Sons Ltd, 9-20.

Kay, M. & R. C. Mainfort, 2014. Functional analysis of prismatic blades and bladelets from Pinson Mounds, Tennessee. *Journal of Archaeological Science,* 50, 63-83.

Keegan, W. F., 1984. Pattern and Process in *Strombus gigas* Tool Replication. *Journal of New World Archaeology,* VI(2), 15-24.

Keegan, W. F., 1991. *Archaeology at Pearls, Grenada: the 1990 Field Season.* Gainesville, Florida: Florida Museum of Natural History.

Keegan, W. F., 1994. West Indian Archaeology. 1. Overview and Foragers. *Journal of Archaeological Research,* 2(3), 255-284.

Keegan, W. F., 2000. West Indian Archaeology. 3. Ceramic Age. *Journal of Archaeological Research,* 8(2), 135-167.

Keegan, W. F., 2004. Islands of Chaos, in *The Late Ceramic Age in the Eastern Caribbean*, eds. A. Delpuech & C. Hofman. Oxford: Archaeopress, 33-44.

Keegan, W. F., 2007. *Taino Indian Myth and Practice: The arrival of the stranger king.* Gainesville: University Press of Florida.

Keegan, W. F., 2013. The "classic" Taíno, in *The Oxford Handbook of Caribbean Archaeology*, eds. W. F. Keegan, C. L. Hofman & R. Rodríguez Ramos. Oxford: Oxford University Press, 70-83.

Keegan, W. F., 2015. Mobility and Disdain: Columbus and Cannibals in the Land of Cotton. *Ethnohistory,* 62(1), 1-15.

Keegan, W. F., 2018. Caribbean Kinship as Instituted Process. *The Journal of Island and Coastal Archaeology*, 1-19.

Keegan, W. F. & B. Byrne, 1999. Structural analysis of Saladoid adornos from Grenada, in *18th International Congress for Caribbean Archaeology.* St. George, Grenada: L'Association Internationale d'Archéologie de la Caraïbe, 21-23.

Keegan, W. F. & A. K. Cody, 1989. *Progress report on the archaeological excavation at the site of Pearls, Grenada, August 1989.* Alpine & St George's: Submitted to the Grenada Ministry of Education.

Keegan, W. F. & C. L. Hofman, 2017. *The Caribbean before Columbus.* Oxford: Oxford University Press.

Keegan, W. F. & R. Rodríguez Ramos, 2005. Archaic origins of the Classic Taínos, in *XXI Congress of the International Association for Caribbean Archaeology*, eds. B. A. Reid, H. Petitjean Roget & L. A. Curet. St. Augustine: School of Continuing Studies, University of the West Indies, 211-217.

Keehnen, F. W. M., 2011. Conflicting cosmologies: The exchange of brilliant objects between the Taíno of Hispaniola and the Spanish, in *Communities in Contact: Essays in archaeology, ethnohistory & ethnography of the Amerindian circum-Caribbean*, eds. C. L. Hofman & A. Van Duijvenbode. Leiden: Sidestone Press, 253-268.

Keehnen, F. W. M., 2012. *Trinkets (f)or treasure? The role of European material culture in intercultural contacts in Hispaniola during early colonial times.* MA (research) thesis. Leiden: Leiden University, Faculty of Archaeology.

Keeley, L. H., 1977. The functions of Paleolithic flint tools. *Scientific American,* 237(5), 108-126.

Keeley, L. H., 1980. *Experimental determination of stone tool uses. A microwear analysis.* Chicago: The University of Chicago Press.

Keeley, L. H., 1982. Hafting and retooling: Effects on the archaeological record. *American Antiquity,* 47(4), 798-809.

Keeley, L. H. & M. H. Newcomer, 1977. Microwear analysis of experimental flint tools: a test case. *Journal of Archaeological Science,* 4(1), 29-62.

Kelly, H. J., 2003. *Amerindian Coral Tools. A pilot study in experimental archaeology on coral artefacts from Anse à la Gourde, Guadeloupe.* MA Thesis. Leiden: Leiden University, Faculty of Archaeology.

Kelly, H. J., 2004. Experimental archaeology and use wear analysis: Understanding the effects of coral tools on shell, in *The Archaeology of Aruba: The marine shell heritage*, eds. R. A. C. F. Dijkhoff & M. S. Linville. Oranjestad: Archaeological Museum of Aruba, 125-132.

Kelly, H. J. & A. L. Van Gijn, 2008. Understanding the function of coral tools from Anse a la Gourde: an experimental approach, in *Crossing disicplinary boundaries and national borders. New methods and techniques in the study of archaeological materials from the Caribbean*, eds. C. L. Hofman, M. Hoogland & A. L. Van Gijn. Tuscaloosa: Alabama University Press, 115-124.

Kelterborn, P., 1991. Towards replicating Neolithic stone sawing, in *Archéologie Expérimentale. Tome 2- La terre, L'os et la pierre, la maison et les champs. Actes du colloque international «Expérimentation en archéologie: bilan et perspectives». Tenn à l'Archéodrome de Beaune les 6, 7, 8 et 9 avril 1988,* Paris: Editions Errance, 129-137.

Kenoyer, J. M., 1997. Trade and technology of the Indus Valley: New insights from Harappa, Pakistan. *World Archaeology,* 29(2), 262-280.

Kerchache, J. (ed.) 1994. *L'art des sculpteurs Taïnos : chefs-d'œuvre des Grandes Antilles précolombiennes,* Paris: Éditions des Musées de la Ville de Paris.

Kesler, S. E., N. Russell, C. Reyes, L. Santos, A. Rodriguez & L. Fondeur, 1991. Geology of the Maimon Formation, Dominican Republic. *Geological Society of America Special Papers,* 262, 173-186.

Key, A. J. M., W. J. Stemp, M. Morozov, T. Proffitt & I. Torre, 2015. Is Loading a Significantly Influential Factor in the Development of Lithic Microwear? An Experimental Test Using LSCM on Basalt from Olduvai Gorge. *Journal of Archaeological Method and Theory,* 22(4), 1193-1214.

Kimball, L. R., T. S. Coffey, N. R. Faulks, S. E. Dellinger, N. M. Karas & N. Hidjrati, 2017. A Multi-instrument Study of Microwear Polishes on Mousterian Tools from Weasel Cave (Myshtulagty Lagat), Russia. *Lithic Technology,* 42(2-3), 61-76.

Kimball, L. R., J. F. Kimball & P. E. Allen, 1995. Microwear polishes as viewed through the atomic force microscope. *Lithic Technology,* 20(1), 6-28.

Kirby, E., 1969. The Pre-Columbian Stone Monuments of St. Vincent, West Indies, in *Third International Congress for the Study of pre-Columbian Cultures of the Lesser Antilles*, ed. R. P. Bullen. St. George's, Grenada: The Grenada National Trust, 114-128.

Knaf, A. C. S., J. M. Koornneef & G. R. Davies, 2017. "Non-invasive" portable laser ablation sampling of art and archaeological materials with subsequent Sr-Nd isotope analysis by TIMS using 1013 Ω amplifiers. *Journal of Analytical Atomic Spectrometry,* 32(11), 2210-2216.

Knappett, C., 2005. *Thinking through material culture: an interdisciplinary perspective.* Philadelphia: University of Pennsylvania press.

Knappett, C., 2011. *An Archaeology of Interaction: Network Perspectives on Material Culture and Society.* Oxford: Oxford University Press.

Knappett, C. (ed.) 2013. *Network Analysis in Archaeology: New Approaches to Regional Interaction,* Oxford: Oxford University Press.

Knippenberg, S., 2004. Distribution and exchange of lithic materials: Three-pointers and axes from St. Martin, in *Late Ceramic Age Societies in the Eastern Caribbean*, eds. A. Delpuech & C. L. Hofman. Oxford: Archaeopress, 121-138.

Knippenberg, S., 2005. Long Island flint production, distribution and exchange among the Northern Lesser Antilles, in *XXI Congress of the International Association for Caribbean Archaeology*, eds. B. A. Reid, H. Petitjean Roget & L. A. Curet. St. Augustine: School of Continuing Studies, University of the West Indies, 813-822.

Knippenberg, S., 2006. *Stone artefact production and exchange among the Northern Lesser Antilles.* Leiden: Leiden university.

Knippenberg, S., 2012. Anexo 4: Jadeitite axe manufacture in Hispaniola. A preliminary report on the lithics from the Playa Grande site, Northern Dominican Republic, in *El sitio arqueológico de Playa Grande, Río San Juan, María Trinidad Sánchez: Informe de las excavaciones arqueológicas campaña 2011 – 2012*, ed. A. J. López Belando. Santo Domingo: Museo del Hombre Dominicano.

Knippenberg, S. & J. J. P. Zijlstra, 2008. Chert sourcing in the northern Lesser Antilles: The use of geochemical techniques in discriminating chert materials, in *Crossing the Borders: New methods and techniques in the study of archaeological materials from the Caribbean*, eds. C. L. Hofman, M. L. P. Hoogland & A. L. Van Gijn. Tuscaloosa: University of Alabama Press, 43-65.

Knutsson, K., 1988. *Patterns of Tool Use. Scanning Electron Microscopy of Experimental Quartz Tools.* Uppsala: Societas Archaeologica Upsaliensis.

Knutsson, K., B. Dahlquist & H. Knutsson, 1988. Patterns of tool use: The microwear analysis of the quartz and flint assemblage from the Bjusselet site, Västerbotten, Northern Sweden, in *Industries Lithiques: Tracéologie et Technologie*, ed. S. Beyries. Oxford: Archaeopress, 253-294.

Koch-Grünberg, T., 1921. *Zwei jahre bei den Indianern Nord-West Brasiliens.* Stuttgart: Strecker und Schröder Verlag.

Koch-Grünberg, T., 2000[1916]. *Vom Roraima zum Orinoco: Ergebnisse einer Reise in Nordbrasilien und Venezuela in den Jahren 1911-1913. Volume 2: Mythen und Legenden derTaulipang- und Arekuna-Indianer.* Cambridge: Cambridge University Press.

Kopytoff, I., 1986. The cultural biography of things: commoditization as process, in *The social life of things: commodities in cultural perspective*, ed. A. Appadurai. Cambridge: Cambridge University Press, 64-91.

Kozák, V., 1972. Stone age revisited. Natural History 81 (8): 14-24. *Natural History,* 81(8), 14-24.

Kozák, V., D. Baxter, L. Williamson & R. L. Carneiro, 1979. The Héta Indians: Fish in a dry pond. *Anthropological Papers of the American Museum of Natural History,* 55(6), 353-434.

Krasinski, K. E., 2018. Multivariate evaluation of criteria for differentiating cut marks created from steel and lithic implements. *Quaternary International,* 466 B, 145-156.

Krebs, M., 2008. *Druck-Temperatur-Zeit-Pfade subduktionszonenbezogener Hochdruckmetamorphite des Rio San Juan-Komplexes, Dominikanische Republik.* Ph.D. dissertation. Bochum: Ruhr-Universität Bochum, Fakultät für Geowissenschaften.

Krebs, M., H. P. Schertl, W. V. Maresch & G. Draper, 2011. Mass flow in serpentinite-hosted subduction channels: P–T–t path patterns of metamorphic blocks in the Rio San Juan mélange (Dominican Republic). *Journal of Asian Earth Sciences,* 42(4), 569-595.

Kristiansen, K., 2014. Towards a new Paradigm? The Third Science Revolution and its Possible Consequences in Archaeology. *Current Swedish Archaeology,* 22, 11-34.

Kufel-Diakowska, B. & M. Skuła, 2015. Life and afterlife of tools: Axes of the Corded Ware culture in morpho-functional analysis. *Sprawozdania Archeologiczne,* 67, 57-65.

Kuhn-Spearing, L. T., H. Kessler, S. M. Spearing, R. Ballarini & A. H. Heuer, 1996. Fracture mechanisms of the *Strombus gigas* conch shell: Implication for the design of brittle laminates. *Journal of Materials Science,* 31, 6583-6594.

Kuijpers, M. H. G., 2017. *An Archaeology of Skill; Metalworking Skill and Material Specialization in Early Bronze Age Central Europe.* Routledge.

Laffoon, J. E., M. L. P. Hoogland, G. R. Davies & C. L. Hofman, 2017a. A Multi-Isotope Investigation of Human and Dog Mobility and Diet in the Pre-Colonial Antilles. *Environmental Archaeology*, 1-17.

Laffoon, J. E., E. Plomp, G. R. Davies, M. L. P. Hoogland & C. L. Hofman, 2013. The Movement and Exchange of Dogs in the Prehistoric Caribbean: An Isotopic Investigation. *International Journal of Osteoarchaeology*, 25(4), 454-456.

Laffoon, J. E., R. Rodríguez Ramos, L. Chanlatte Baik, Y. Narganes Storde, M. Rodríguez Lopez, G. R. Davies & C. L. Hofman, 2014. Long-distance exchange in the precolonial Circum-Caribbean: A multi-isotope study of animal tooth pendants from Puerto Rico. *Journal of Anthropological Archaeology,* 35, 220-233.

Laffoon, J. E., T. F. Sonnemann, M. M. Antczak & A. Antczak, 2016. Sourcing nonnative mammal remains from Dos Mosquises Island, Venezuela: new multiple isotope evidence. *Archaeological and Anthropological Sciences*, 1-17.

Laffoon, J. E., T. F. Sonnemann, T. Shafie, C. L. Hofman, U. Brandes & G. R. Davies, 2017b. Investigating human geographic origins using dual-isotope (87Sr/86Sr, δ18O) assignment approaches. *PLoS ONE,* 12(2), e0172562.

Lagrou, E., 2009. The crystallized memory of artifacts: A reflection on agency and alterity in Cashinahua image-making, in *The Occult Life of Things: Native Amazonian theories of materiality and personhood*, ed. F. Santos-Granero. Tucson: The University of Arizona Press, 192-213.

Lalueza-Fox, C., M. T. P. Gilbert, A. J. Martinex-Fuentes, F. Calafell & J. Bertranpetit, 2003. Mitochondrial DNA from Pre-Columbian Ciboneys from Cuba and the Prehistoric COlonization of the Caribbean. *American Journal of Physiscal Anthropology,* 121, 97-108.

Laming-Emperaire, A., 1964. Les Xeta, survivants de l'age de la pierre. *Objets et Mondes,* 4(4), 263-276.

Laming-Emperaire, A., M. J. Menezes & M. D. Andreatta, 1978. O trabalho da pedre entre os Xetá Serra dos Dourados, estado do Parana, in *Boletânea de Estudos em Homenagem a Annette Laming-Emperaire*Universidad de São Paulo.

Lammers-Keijsers, Y. M. J., 1999. Use wear analysis on pre-Columbian shell artefacts of the Anse à la Gourde site, Guadeloupe, in *18th International Congress for Caribbean Archaeology.* St. George, Grenada: L'Association Internationale d'Archéologie de la Caraïbe, 179-186.

Lammers-Keijsers, Y. M. J., 2007. *Tracing traces from present to past: a functional analysis of pre-columbian shell and stone artefacts from Anse à la gourde and Morel, Guadeloupe.* Phd Leiden: University Leiden, Faculty of Archaeology.

Lammers-Keijsers, Y. M. J., 2008. Tracing traces from present to past. The use of shell, flint and stone artefacts on Morel and Anse à la Gourde, Guadeloupe, FWI, in *Prehistoric Technology' 40 years later: Functional Studies and the Russian Legacy. Proceedings of the International Congress Verona (Italy), 20-23 April 2005*, eds. L. Longo & N. Skakun. Oxford: Archaeopress, 365-368.

LaMotta, V. M., 2012. Behavioral archaeology, in *Archaeological Theory Today*, ed. I. Hodder. Cambridge: Polity

Press, 62-92.

Lange, F. W. (ed.) 1993. *Precolumbian Jade: New geological and cultural interpretations,* Salt Lake City: University of Utah Press.

Langejans, G. H. J. & M. Lombard, 2015. About Small Things and Bigger Pictures: An Introduction to the Morphological Identification of Micro-residues on Stone Tools, in *Use-Wear and Residue Analysis in Archaeology*, eds. J. M. Marreiros, J. F. Gibaja Bao & N. Ferreira Bicho. Springer International Publishing, 199-219.

Lapierre, H., V. Dupuis, B. M. d. Lépinay, M. Tardy, J. Ruíz, R. C. Maury, J. Hernandez & M. Loubet, 1997. Is the Lower Duarte Igneous Complex (Hispaniola) a Remnant of the Caribbean Plume-Generated Oceanic Plateau? *The Journal of Geology,* 105(1), 111-120.

Lapierre, H., V. Dupuis, B. Mercier de Lépinay, D. Bosch, P. Monié, M. Tardy, R. C. Maury, J. Hernandez, M. Polvé, D. Yeghicheyan & J. Cotten, 1999. Late Jurassic Oceanic Crust and Upper Cretaceous Caribbean Plateau Picritic Basalts Exposed in the Duarte Igneous Complex, Hispaniola. *The Journal of Geology,* 107(2), 193-207.

Las Casas, B., 1566. *Apologética Historia Sumaria.* Fundación el Libro Total.

Las Casas, B., 1875. *Historia de las Indias.* Madrid: Imprenta de Miguel Ginesta.

Latour, B., 2009. Perspectivism: 'Type' or 'bomb'? *Anthropology today,* 25(2), 1-2.

Lave, J. & E. Wenger, 1991. *Situated Learning: Legitimate Peripheral Participation.* Cambridge: Cambridge University Press.

Lavier, C., T. Borel & D. Vigears, 2009. Tracéologie appliquée aux objets et œuvres d'art en bois des musées de France: premiers exemples d'adaptations, de développements techniques et de résultats au sein du C2RMF. *Technè,* 29, 15-21.

Lbova, L. & P. Volkov, 2016. Processing technology for the objects of mobile art in the Upper Paleolithic of Siberia (the Malta site). *Quaternary International,* 403, 16-22.

Le Maitre, R. W. (ed.) 2002. *Igneous Rocks: A classification and glossary of terms,* Cambridge: Cambridge University Press.

Lekberg, P., 2000. The Lives and Lengths of Shaft-Hole Axes, in *Form, Function, Context: Material Culture Studies in Scandinavian Archaeology*, eds. D. S. Olausson & H. Vandkilde. Lund: Institute of Archaeology, 155-161.

LeMoine, G. M., 1994. Use Wear on Bone and Antler Tools from the Mackenzie Delta, Northwest Territories. *American Antiquity,* 59(2), 316-334.

Lemonnier, P., 1986. The study of material culture today: toward an anthropology of technological systems. *Journal of Anthropological Archaeology,* 5(2), 147-186.

Lemonnier, P. (ed.) 1993. *Technological Choices : transformation in material cultures since the Neolithic,* London: Routledge.

Lemorini, C., T. W. Plummer, D. R. Braun, A. N. Crittenden, P. W. Ditchfield, L. C. Bishop, F. Hertel, J. S. Oliver, F. W. Marlowe, M. J. Schoeninger & R. Potts, 2014. Old stones' song: Use-wear experiments and analysis of the Oldowan quartz and quartzite assemblage from Kanjera South (Kenya). *Journal of Human Evolution,* 72, 10-25.

Lenink, S., 2012. Carib as a Colonial Category: Comparing Ethnohistoric and Archaeological Evidence from Dominica, West Indies. *Ethnohistory,* 59(1), 79-107.

Lepère, C., 2014. Experimental and traceological approach for a technical interpretation of ceramic polished surfaces. *Journal of Archaeological Science,* 46, 144-155.

Lerner, H., X. Du, A. Costopoulos & M. Ostoja-Starzewski, 2007. Lithic raw material physical properties and use-wear accrual. *Journal of Archaeological Science,* 34(5), 711-722.

Lerner, H. J., 2007. Digital Image Analysis and Use-Wear Accrual as a Function of Raw Material: An Example from Northwestern New Mexico. *Lithic Technology,* 32(1), 51-67.

Lerner, H. J., 2014. Intra-raw material variability and use-wear formation: an experimental examination of a Fossiliferous chert (SJF) and a Silicified Wood (YSW) from NW New Mexico using the Clemex Vision processing frame. *Journal of Archaeological Science,* 48, 34-45.

Leroi-Gourhan, A., 1964. *Le Geste et la parole. I : technique et langage.* Paris: Albin Michel.

Leung, H. M. & S. K. Sinha, 2009. Scratch and indentation tests on seashells. *Tribology International,* 42(1), 40-49.

Levi-Sala, I., 1986. Use wear and post-depositional surface modification: A word of caution. *Journal of Archaeological Science,* 13(3), 229-244.

Levi-Sala, I., 1993. Use-wear traces: processes of development and post-depositional alterations, in *Traces et fonction: les gestes retrouvés. Actes du Colloque international de Liège*, eds. P. C. Anderson, S. Beyries, M. Otte & H. Plisson. Liège: Édition ERAUL 50, 401-416.

Levi-Sala, I., 1996. *A Study of Microscopic Polish on Implements.* Oxford: Archaeopress.

Lévi-Strauss, C., 1966. *Du Miel aux Cendres.* Paris: Librairie Plon.

Lewis, J. F. & J. G. Jiménez G., 1991. Duarte Complex in the La Vega-Jarabacoa-Janico area, central Hispaniola; Geologic and geochemical features of the sea floor during the early stages of arc evolution. *Geological Society of America Special Papers,* 262, 115-142.

Lewis, R., M. Rahim, J. Cripps, V. Roubos & C. Tsoraki, 2009. Wear of stone used to manufacture axes in the Neolithic settlement at Makriyalos in Northern Greece. *Wear,* 267(5–8), 1325-1332.

Lewis, R., C. Tsoraki, J. Broughton, J. C. Cripps, S. A. Afodun, T. Slatter & V. Roubos, 2011. Abrasive and impact wear of stone used to manufacture axes in Neolithic Greece. *Wear,* 271(9–10), 2549-2560.

Liang, Y., J. Zhao, L. Wang & F.-m. Li, 2008. The relationship between mechanical properties and crossed-lamellar structure of mollusk shells. *Materials Science and Engineering: A,* 483–484, 309-312.

Lin, A. Y. M., M. A. Meyers & K. S. Vecchio, 2006. Mechanical properties and structure of *Strombus gigas*, *Tridacna gigas*, and *Haliotis rufescens* sea shells: A comparative study. *Materials Science and Engineering: C,* 26(8), 1380-1389.

Lippold, L. K., 1989. Animal resource utilization by Saladoid peoples at Pearls, Grenada, West Indies, in *13th International Congress for Caribbean Archaeology*, eds. E. N. Ayubi & J. Haviser. Willemstad, Curaçao, 264-268.

Little, A., A. van Gijn, T. Collins, G. Cooney, B. Elliott, B. Gilhooly, S. Charlton & G. Warren, 2016. Stone Dead: Uncovering Early Mesolithic Mortuary Rites, Hermitage, Ireland. *Cambridge Archaeological Journal*, 1-21.

Little, E. L. J. & F. H. Wadsworth, 1964. *Common Trees of Puerto Rico and the Virgin Islands.* Washington: U.S. Department of Agriculture.

Liu, L., J. Field, R. Fullagar, S. Bestel, X. Chen & X. Ma, 2010. What did grinding stones grind? New light on early Neolithic subsistence economy in the Middle Yellow River Valley, China. *Antiquity,* 84(325), 816-833.

Lombard, M., 2005. Evidence of hunting and hafting during the Middle Atone Age at Sibidu Cave, KwaZulu-Natal, South Africa: a multianalytical approach. *Journal of Human Evolution,* 48, 279-300.

Loncan, A., 1985. Essai De Typologie des Poussoirs de L'île de Cayenne, in *Eleventh Congress of the International*

Association for Caribbean Archaeology, eds. A. G. Pantel Tekakis, I. Vargas Arenas & M. Sanoja Obediente. San Juan, Puerto Rico: La Fundación, Arqueológica, Antropológica e Histórica de Puerto Rico, 112-119.

Longwood, F. B., 1971. *Present and Potential Commercial Timbers of The Caribbean.* Washington: U.S. Department of Agriculture.

López Belando, A. J., 2012. *El sitio arqueológico de Playa Grande, Río San Juan, María Trinidad Sánchez: Informe de las excavaciones arqueológicas campaña 2011 – 2012.* Santo Domingo: Museo del Hombre Dominicano.

López Belando, A. J., 2013. Excavaciones arqueológicas en el poblado taíno de Playa Grande, República Dominicana, in *25th International Congress for Caribbean Archeology*, ed. L. Del Olmo. San Juan: Instituto de Cultura Puertorriqueña/Centro de Estudios Avanzados de Puerto Rico y el Caribe/Universidad de Puerto Rico, 254-279.

López Varela, S. L., A. L. Van Gijn & L. F. H. C. Jacobs, 2002. De-mystifying pottery production in the Maya Lowlands: Detection of traces of use-wear on pottery sherds through microscopic analysis and experimental replication. *Journal of Archaeological Science,* 29(10), 1133-1147.

Lothrop, S. K., 1955. Jade and String Sawing in Northeastern Costa Rica. *American Antiquity,* 21(1), 43-51.

Lovén, S., 1935. *Origins of the Tainan culture, West Indies.* Goteburg: Elander.

Lowenstam, H. A. & S. Weiner, 1989. *On Biomineralization.* New York: Oxford University Press.

Lozano, J. A., E. Puga, A. Garcia-Casco, F. Martínez-Sevilla, F. Contreras Cortés, J. Carrasco Rus & A. Martín-Algarra, 2017. First evidence of prehistoric eclogite quarrying for polished tools and their circulation on the Iberian Peninsula. *Geoarchaeology,* 33(3), 364-385.

Lunardi, A., 2008. Experimental testing with polished green stone axes and adzes: technology and use, in *Prehistoric Technology' 40 years later: Functional Studies and the Russian Legacy. Proceedings of the International Congress Verona (Italy), 20-23 April 2005*, eds. L. Longo & N. Skakun. Oxford: Archaeopress, 369-373.

Lunardi, A., 2009. Quinzano and Rivoli - Two middle Neolithic sites in the Adige valley (Verona, north-eastern Italy): Lithic choices and functional aspects of the non-flint stone implements, in *Non-Flint Raw Material use in Prehistory: Old prejudices and new directions*, eds. F. Sternke, L. Eigeland & L.-J. Costa. Oxford: Archaeopress, 111-121.

Lundberg, E. R., 1983. Observations on Strombus columella fragments, cautionary notes and experimental microwear analysis, in *10th International Congress for the study of the pre-Columbian Cultures of the Lesser Antilles*, eds. L. Allaire & F.-M. Mayer. Fort-de-France, Martinique: Centre de Recherches Caraïbes, Université de Montréal, 347-361.

MacDonald, D. A. & A. A. Evans, 2014. Evaluating Surface Cleaning Techniques of Stone Tools Using Laser Scanning Confocal Microscopy. *Microscopy Today,* 22(3), 22-26.

Madgwick, R., 2014. What makes bones shiny? Investigating trampling as a cause of bone abrasion. *Archaeological and Anthropological Sciences,* 6(2), 163-173.

Maeir, A. M., B. Davis, L. K. Horwitz, Y. Asscher & L. A. Hitchcock, 2015. An ivory bowl from Early Iron Age Tell es-Safi/Gath (Israel): manufacture, meaning and memory. *World Archaeology,* 47(3), 414-438.

Maigrot, Y., 2008. Bone tools use-wear analysis and image analysis: test of 3D digital restoration of worked and used surfaces, in *'Prehistoric Technology' 40 years later: Functional Studies and the Russian Legacy. Proceedings of the International Congress Verona (Italy), 20-23 April 2005*, eds. L. Longo & N. N. Skakun. Oxford: Archaeopress, 375-378.

Mann, P., G. Draper & J. F. Lewis, 1991. An overview of the geologic and tectonic development of Hispaniola, in *Geologic and Tectonic Development of the North America-Caribbean Plate Boundary in Hispaniola*, eds. P. Mann, G. Draper & J. F. Lewis. Boulder: Geological Society of America, 1-28.

Mansur-Franchomme, M. E., 1983. Scanning Electron Microscopy of Dry Hide Working Tools: The Role of Abrasives and Humidity in Microwear Polish Formation. *Journal of Archaeological Science,* 10, 223-230.

Mansur, M. E., 1997. Functional analysis of polished stone-tools: Some considerations about the nature of polishing, in *Siliceous rocks and culture*, eds. R.-M. A. & M. A. Bustillo. Granada: Editorial Universidad de Granada, 465-486.

Mansur, M. E. & R. A. Srehnisky, 1996. El alisador basáltico de Shamakush I: microrrastros de uso mediante el análisis de imágenes digitalizadas. *Relaciones de la Sociedad Argentina de Antropología,* 21, 267-288.

Maresch, W. V., C. Grevel, K. P. Stanek, H.-P. Schertl & M. A. Carpenter, 2012. Multiple growth mechanisms of jadeite in Cuban metabasite. *European Journal of Mineralogy,* 24(2), 217-235.

Margaris, A. V., 2014. Reconsidering Raw Material Selection: Skeletal Technologies and Design for Durability in Subarctic Alaska. *Journal of Archaeological Method and Theory,* 21(3), 669-695.

Marin, F. & G. Luquet, 2004. Molluscan shell proteins. *Comptes Rendus Palevol,* 3(6–7), 469-492.

Martina, M. C., F. Cesarani, R. Boano, E. R. Massa, C. C. Venturi & G. Gandini, 2010. Scenes from the Past: Multidetector CT of an Antillean Zemi Idol. *Radiographics,* 30, 1993-1999.

Martinón-Torres, M. & D. Killick, 2015. Archaeological Theories and Archaeological Sciences, in *The Oxford Handbook of Archaeological Theory* eds. A. Gardner, M. Lake & U. Sommer. Oxford: Oxford University Press.

Martinón-Torres, M., R. V. Rojas, J. Cooper & T. Rehren, 2007. Metals, microanalysis and meaning: a study of metal objects excavated from the indigenous cemetery of El Chorro de Maíta, Cuba. *Journal of Archaeological Science,* 34(2), 194-204.

Martinón-Torres, M., R. Valcárcel Rojas, J. Sáenz Samper & M. F. Guerra, 2012. Metallic encounters in Cuba: The technology, exchange and meaning of metals before and after Columbus. *Journal of Anthropological Archaeology,* 31(4), 439-454.

Masclans Latorre, A., A. Palomo Pérez & J. F. Gibaja Bao, 2013. Techno functional studies of polished stone axes and adzes: experimental programme and first results, Poster in *19th Annual Meeting of the European Association of Archaeologists*, Pilsen.

Masclans Latorre, A., A. Palomo Pérez, J. F. Gibaja Bao, G. Remolins Zamora & D. Gómez-Gras, 2017. Use-wear analysis of Neolithic polished axes and adzes: The site of "Bòbila Madurell-Can Gambús-1-2" (Northeast Iberian Peninsula). *Quaternary International,* 427, Part B, 158-174.

Mason, O. T., 1876. The Latimer Collection of Antiquities from Porto Rico in the National Museum, at Wasinghton D.C. *Ethnologie Annual Repost of the Board of Regents of the Smitherson Institute*, 372-393.

Mason, O. T., 1884. The Guesde Collection of Antiquities in Pointe-a-Pitre, Guadaloupe, West Indies. *Annual Report of the Board of Regent of the Smithonian Institute*, 731-837.

Masson, A., E. Coqueugniot & S. Roy, 1981. Silice et traces d'usage: le lustré des faucilles. *Nouvelles Archives Museum d'Histoire Naturelle de Lyon,* 19, 43-51.

Mathieu, J. R. & D. A. Meyer, 1997. Comparing Axe Heads of Stone, Bronze, and Steel: Studies in Experimental Archaeology. *Journal of Field Archaeology,* 24(3), 333-351.

McBryde, I., 1984. Kulin greenstone quarries: The social contexts of production and distribution for the Mt. William site. *World Archaeology,* 16(2), 267-285.

McCusick, M., 1960. Aboriginal Canoes in the West Indies, in *Papers in Caribbean Anthropology*, ed. S. W. Mintz. New Haven: Yale University.

McDonald, M. M. A., 1991. Systematic Reworking of Lithics from Earlier Cultures in the Early Holocene of Dakhleh Oasis, Egypt. *Journal of Field Archaeology,* 18(2), 269-273.

McGinnis, S. A. M., 1997. *Ideographic expression in the pre-Columbian Caribbean.* Ph.D. dissertation. Austin: University of Texas.

Meeks, N. D., G. de G. Sieveking, M. S. Tite & J. Cook, 1982. Gloss and use-wear traces on flint sickles and similar phenomena. *Journal of Archaeological Science,* 9(4), 317-340.

Melgar Tísoc, E. R. & C. Andrieu, 2016. Capitulo X: Informe del análisis tecnológico de objetos de jadeíta de el Perú Waká, in *Proyecto Arqueológico Regional Waká: Informe no. 13, Temporada 2015*, eds. D. A. Freidel & J. C. Pérez. Nueva Guatemala de la Asunción: Dirección General del Patrimonio Cultural y Natural.

Melgar Tísoc, E. R., E. Gallaga Murrieta & R. B. Solís Ciriaco, 2014. La pirita y su manufactura: análisis de cuatro contextos mesoamericanos. *Estudios de cultura maya,* 43, 41-68.

Melgar Tísoc, E. R. & R. B. Solís Ciriaco, 2013. Los secretos artesanales de los lapidarios: instrumentos y técnicas de trabajo en Mesoamérica y China, in *La nueva Nao: De Formosa a América Latina. Bicentenario del Nombramiento de Simón Bolívar como Libertador*, eds. L. Chen & A. Saladino García. Taipei: University of Tamkang, 93-119.

Melgar Tísoc, E. R., R. B. Solis Ciriaco & L. Filloy Nadal, 2013. Análisis tecnológico de las piezas de jadeíta y pedernal del cinturón de poder y de la banda frontal de K'inich Janaab' Pakal de Palenque, in *Técnicas analíticas aplicadas a a la caracterización y producción de materiales arqueológicos en el área maya*, eds. A. Velázquez Castro & L. S. Lowe. México: Universidad Nacional Autónoma de México.

Mendoza Cuevas, A., M. Iturralde-Vinent & A. García Casco, 2009. Identificación no destructiva de jade en objetos arqueológicos: estudio de idolillos de aborígenes Taínos, in *Subduction Zones of the Caribbean* Cuba: http://www.ugr.es/~agcasco/igcp546/Cuba09/Cuba_2009_Abstracts.htm.

Menezes, P. L., S. V. Kailas & M. R. Lovell, 2013a. Fundamentals of Engineering Surfaces, in *Tribology for Scientists and Engineers: From basics to advanced concepts*, eds. P. L. Menezes, S. P. Ingole, M. Nosonovsky, S. V. Kailas & M. R. Lovell. New York: Springer, 3-41.

Menezes, P. L., M. Nosonovsky, S. V. Kailas & M. R. Lovell, 2013b. Friction and Wear, in *Tribology for Scientists and Engineers: From basics to advanced concepts*, eds. P. L. Menezes, S. P. Ingole, M. Nosonovsky, S. V. Kailas & M. R. Lovell. New York: Springer, 43-92.

Menig, R., M. H. Meyers, M. A. Meyers & K. S. Vecchio, 2001. Quasi-static and dynamic mechanical response of *Strombus gigas* (conch) shells. *Materials Science and Engineering: A,* 297(1–2), 203-211.

Meskell, L., 2004. *Object Worlds in Ancient Egypt: Material Biographies Past and Present.* Oxford: Berg.

Metraux, A., 1959. The revolution of the ax. *Diogenes,* 7(25), 28-40.

Mickleburgh, H. L. & J. R. Pagán-Jiménez, 2012. New insights into the consumption of maize and other food plants in the pre-Columbian Caribbean from starch grains trapped in human dental calculus. *Journal of Archaeological Science,* 39(7), 2468-2478.

Miguez, G., N. Nasif, M. Gudemos & S. Bertelli, 2013. Aves, sonidos y chamanes. Estudio interdisciplinario de un instrumento musical óseo procedente de una ocupación prehispánica de las selvas meridionales del noroeste de Argentina. *Anales del Museo de América,* 21, 174-193.

Mille, P., A. Couderc, N. Fouillet, B. Moine & F. Yvernault, 2014. Les bois et les objets composites (bois-métal) de la fouille du parking Anatole France à Tours (Indre-et-Loire). *Revue archéologique du Centre de la France,* 53, 1-67.

Miller, J., 2009. Things as Persons: Body Ornaments and Alterity among the Mamainde (Nambikwara), in *The Occult Life of Things: Native Amazonian theories of materiality and personhood*, ed. F. Santos-Granero. Tucson: The University of Arizona Press, 60-80.

Miller, T., 1979. Stone work of the Xeta Indians of Brazil, in *Lithic Use-wear Analysis*, ed. B. Hayden. New York:

Academic Press, 401-407.

Mills, P. R., 1993. An Axe to Grind: A Functional Analysis of Anasazi Stone Axes from Sand Canyon Pueblo Ruin (5MT765), Southwestern Colorado. *KIVA,* 58(3), 393-413.

Minar, C. J., 2001. Motor Skills and the Learning Process: The Conservation of Cordage Final Twist Direction in Communities of Practice. *Journal of Anthropological Research,* 57(4), 381-405.

Moir, B. G., 1990. Comparative studies of "Fresh" and "Aged" Tridacna gigas shell: Preliminary investigations of a reported technique for pretreatment of tool material. *Journal of Archaeological Science,* 17(3), 329-345.

Mol, A. A. A., 2007. *Costly Giving, Giving Guaízas: Towards an Organic Model of the Exchange of Social Valuables in the Late Ceramic Age Caribbean.* Leiden: Sidestone Press.

Mol, A. A. A., 2010. Something for Nothing: Exploring the Importance of Strong Reciprocity in the Greater Caribbean. *Journal of Caribbean Archaeology,* 9(Special Publication #3), 76-92.

Mol, A. A. A., 2011. The gift of the « Face of the Living »: Shell faces as social valuables in the Caribbean Late Ceramic Age. *Journal de la Société des Américanistes,* 97(2), 7-43.

Mol, A. A. A., 2013. Studying Pre-Columbian Interaction Networks: Mobility and Exchange, in *The Oxford Handbook of Caribbean Archaeology*, eds. W. F. Keegan, C. L. Hofman & R. Rodríguez Ramos. Oxford: Oxford University Press, 329-346.

Mol, A. A. A., 2014. *The Connected Caribbean: A socio-material networks approach to patterns of homogeneity and diversity.* Ph.D. Dissertation. Leiden: Leiden University, Faculty of Archaeology.

Mol, A. A. A. & A. Boomert, 2011. *Brighton Beach, St. Vincent, Excavations and Survey 2011.* Leiden: Leiden University.

Mol, A. A. A., M. L. P. Hoogland & C. L. Hofman, 2015. Remotely Local: Ego-networks of Late Pre-colonial (AD 1000–1450) Saba, North-eastern Caribbean. *Journal of Archaeological Method and Theory,* 22(1), 275-305.

Mol, A. A. A. & J. L. J. A. Mans, 2013. Old-Boy Networks in the Indigenous Caribbean, in *Network Analysis in Archaeology: New Approaches to Regional Interaction*, ed. C. Knappett. Oxford: Oxford University Press, 307-332.

Moreau, J.-P., 1990. *Un flibustier français dans la mer des Antilles (1618-1620). Relation d'un voyage infortuné fait aux Indes occidentales par le capitaine Fleury avec la description de quelques îles qu'on y rencontre, recueillie par l'un de ceux de la compagnie qui fit le voyage.* Paris: Éditions Seghers.

Morero, E., H. Procopiou, R. Vargiolu & H. Zahouani, 2008. Stone vase drilling in Bronze Age Crete, in *Prehistoric Technology' 40 years later: Functional Studies and the Russian Legacy. Proceedings of the International Congress Verona (Italy), 20-23 April 2005*, eds. L. Longo & N. Skakun. Oxford: Archaeopress, 479-482.

Morsink, J., 2013. Exchange as a Social Contract: A Perspective from the Microscale, in *The Oxford Handbook of Caribbean Archaeology*, eds. W. F. Keegan, C. L. Hofman & R. Rodríguez Ramos. Oxford: Oxford University Press, 312-328.

Moss, E. H., 1983. Some comments on edge damage as a factor in functional analysis of stone artifacts. *Journal of Archaeological Science,* 10, 231-242.

Moss, E. H., 1987. A review of "Investigating microwear polishes with blind tests". *Journal of Archaeological Science,* 14, 473-481.

Moss, E. H. & M. H. Newcomer, 1982. Reconstruction of tool use at Pincevent: microwear and experiments, in *Tailler! pour quoi faire: Préhistoire et technologie lithique II, recent progress in microwear studies*, ed. D. Cahen. Tervuren: Musée royal de l'Afrique centrale, 289-312.

Munn, N. D., 1986. *The Fame of Gawa. A Symbolic Study of value transformation in a Massim (Papua New*

Guinea) society. Durham and London: Duke University Press.

Murphy, A. R., D. J. Hozjan, C. N. de Mille & A. A. Levinson, 2000. Pre-Columbian gems and ornamental materials from Antiqua, West Indies. *Gems & Gemology,* 36(3), 234-245.

Myers, N., R. A. Mittermeier, C. G. Mittermeier, G. A. B. da Fonseca & J. Kent, 2000. Biodiversity hotspots for conservation priorities. *Nature,* 403, 853.

Nakahara, H., 1991. Nacre formation in bivalve and gastropod molluscs, in *Biomineralization '90: Mechanisms and Phylogeny of Mineralization in Biological Systems*, eds. S. Suga & H. Nakahara. Tokyo: Springer-Verlag.

Nakahara, H., M. Kakei & G. Bevelander, 1981. Studies on the formation of the crossed lamellar structure in the shell of *Strombus gigas*. *Veliger,* 23(3), 207-211.

Narganes Storde, Y. M., 1993. La lapidaria de La Hueca, Vieques, Puerto Rico, in *15th International Congress for Caribbean Archaeology*, eds. R. E. Alegría & M. Rodríguez Lopez. San Juan: Centro de Estudios Avanzados de Puerto Rico y el Caribe, 141-151.

Narganes Storde, Y. M., 1995. La lapidaria de Sorcé, Vieques y Tecla, Guayanilla, Puerto Rico, in *16th International Congress for Caribbean Archaeology*, ed. G. Richard. Basse-Terre, Guadeloupe: Conseil Régional de la Guadeloupe et Auditorium de la Ville de Basse-Terre, 17-26.

Narganes Storde, Y. M., 2003. Pendientes Antillanos, Animales Suramericanos, in *Twentieth International Congress for Caribbean Archaeology*, eds. C. Tavárez María & M. A. García Arévalo. Santo Domingo, Dominican Republic: Museo del Hombre Dominicano & Fundación García Arévalo, 213-220.

Negrete Martínez, M. A., 2015. *Pointe de Caille: Desarrollo Cultural Postsaladoide en la Isla de Saint Lucia.* Vienna: Österreichische Akademie der Wissenschaften, Philosophisch-historische Klasse.

Neves de Souza, G. & A. Pessoa Lima, 2014. Experimental archaeology on Brazilian polished artifacts: making adornments, hafting blades and cutting trees, in *Technology and Experimentation in Archaeology. Proceedings of the XVI World Congress (Florianópolis, 4-10 September 2011)*, eds. S. Cura, J. Cerezer, M. Gurova, B. Santander, L. Oosterbeek & J. Cristóvão. Oxford: Archaeopress.

Neves, E. G., 2013. Was agriculture a key productive activity in pre-Colonial Amazonia? The stable productive basis for social equality in the central Amazon, in *Human-Environment Interactions: Current and Future Directions*, eds. E. S. Brondízio & E. F. Moran. Dordrecht: Springer Science+Business Media, 371-388.

Neves, N. M. & J. F. Mano, 2005. Structure/mechanical behavior relationships in crossed-lamellar sea shells. *Materials Science and Engineering: C,* 25(2), 113-118.

Newcomer, M. H., R. Grace & R. Unger-Hamilton, 1986. Investigating microwear polishes with blind tests. *Journal of Archaeological Science,* 13, 203-218.

Newcomer, M. H., R. Grace & R. Unger-Hamilton, 1988. Microwear Methodology: A Reply to Moss, Hurcombe and Bamforth. *Journal of Archaeological Science,* 15(1), 25-34.

Newsom, L. A., 1992. Wood Exploitation at Golden Rock (GR-1), in *The archaeology of St. Eustatius: The Golden Rock site*, eds. A. H. Versteeg & K. Schinkel. Amsterdam & St. Eustatius: The Foundation for Scientific Research in the Caribbean Region & The St. Eustatius Historical Foundation, 213-227.

Newsom, L. A., 2008. Caribbean Paleoethnobotany: Present Status and New Horizons (Understanding the Evolution of an Indigenous Ethnobotany), in *Crossing the Borders: New methods and techniques in the study of archaeological materials from the Caribbean*, eds. C. L. Hofman, M. L. P. Hoogland & A. L. Van Gijn. Tuscaloosa: University of Alabama Press, 173-194.

Newsom, L. A., 2010. Paleoethnobotanical Research at Tibes, in *Tibes: People, Power, and Ritual at the Centre of the Cosmos*, eds. L. A. Curet & L. M. Stringer. Tuscaloosa: University of Alabama Press, 80-114.

Newsom, L. A. & E. S. Wing, 2004. *On Land and Sea: Native American uses of biological resources in the West*

Indies. Tuscaloosa: University of Alabama Press.

Nicholson, D. V., 1975. Precolumbian seafaring capabilities in the Lesser Antilles, in *6th International Congress for the Study of pre-Columbian Cultures in the Lesser Antilles*, ed. R. P. Bullen. Pointe à Pitre, Guadeloupe: Florida State Museum, 98-105.

Nieuwenhuis, C. J., 2008. The significance of wear and residue studies: An example from Plum Piece, Saba, in *Crossing the Borders: New Methods and Techniques in the Study of Archaeological Materials from the Caribbean*, eds. C. L. Hofman, M. Hoogland & A. L. Van Gijn. Tuscaloosa: Alabama University Press, 125-136.

Nougier, L.-R. & R. Robert, 1953. Le débitage par sciage dans le « Néolithique pyrénéen ». *Bulletin de la Société Préhistorique de France,* 50(1), 54-60.

Nugent, S. J., 2015. *Sticks and Stones: A Functional Analysis of Aboriginal Spears from Northern Australia.* Ph.D. dissertation. Brisbane: University of Queensland, School of Social Science.

O'B. Harris, P., 1971. Preliminary report on Banwari Trace, a preceramic site in Trinidad, in *The 4th International Congress for Caribbean Archaeology. Reduit Beach, St. Lucia, July 26-30, 1971*, ed. R. P. Bullen. St. Lucia: St. Lucia Archaeological and Historical Society, '115-125.

O'B. Harris, P., 1975. Excavation report on the ceramic site of Golden Grove, Tobago, in *6th International Congress for the Study of pre-Columbian Cultures in the Lesser Antilles*, ed. R. P. Bullen. Pointe à Pitre, Guadeloupe: Florida State Museum, 145-157.

O'B. Harris, P., 1979. Excavation Report: Lovers Retreat period IV, Tobago, in *Eight International Congress for the Study of the Pre-Columbian Cultures of the Lesser Antilles*, ed. S. Lewenstein. St. Kitts: Arizona State University

O'B. Harris, P., 1981. Antillean axes/adzes: Persistance of an Archaic tradition, in *The Ninth International Congress for the study of the pre-Columbian Cultures of the Lesser Antilles*, eds. J. Benoist & F.-M. Mayer. Santo Domingo: Centre de Recherches Caraïbes, Université de Montréal, 257-290.

O'Brien, M. J. & L. R. Lyman, 2002. The epistemological nature of archaeological units. *Anthropological Theory,* 2(1), 37-56.

O'Day, S. J. & W. F. Keegan, 2001. Expedient Shell Tools from the Northern West Indies. *Latin American Antiquity,* 12(3), 275-290.

Odell, G. H., 1980. Toward a more behavioral approach to archaeological lithic concentrations. *American Antiquity,* 45, 404-431.

Odell, G. H., 1981. The mechanics of use-breakage of stone tools: some testable hypothesis. *Journal of Field Archaeology,* 8, 197-211.

Odell, G. H., 2001. Stone tool research at the end of the millennium. Classification, function, and behavior. *Journal of Archaeological Research,* 9(1), 45-100.

Odell, G. H. & F. Odell-Vereecken, 1980. Verifying the reliability of lithic usewear assessments by blind tests: the low-power approach. *Journal of Field Archaeology,* 7, 87-120.

Oduor, N. M. & J. K. Githiomi, 2013. Fuel-wood energy properties of *Prosopis juliflora* and *Prosopis pallida* grown in Baringo District, Kenya. *African Journal of Agricultural Research,* 8(2), 2476-2481.

Olausson, D. S., 1982/1983. *Flint and groundstone axes in the Scanian Neolithic: An evaluation of raw materials based on experiment.* Lund: Kungl. Humanistika Vetenskapssamfundet i Lund.

Oliver, J. R., 1998. *El Centro Ceremonial de Caguana, Puerto Rico: Simbolismo iconográfico, cosmovisión y el poderío caciquil Taíno de Boriquén.* Oxford: Archaeopress.

Oliver, J. R., 2000. Gold Symbolism among Caribbean Chiefdoms. Of Feathers, Çibas, and Guanín Power Taino Elites, in *Precolumbian Gold. Technology, Style and Iconography*, ed. C. McEwan. London/Singapore:

British Museum Press, 196-219.

Oliver, J. R., 2008. Tempos difíciles: Fray Ramón Pané en la Española, 1494-1498, in *El Caribe Precolombino: Fray Ramón Pané y el universo Taíno*, eds. J. R. Oliver, C. McEwan & A. C. Gilberga. Barcelona: Museo Barbier-Mueller and Fundacion Caixa Galicia, 72-95.

Oliver, J. R., 2009. *Caciques and Cemi idols : the web spun by Taino rulers between Hispaniola and Puerto Rico.* Tuscaloosa: University of Alabama Press.

Oliver, J. R., C. McEwan & A. C. Gilberga (eds.), 2008. *El Caribe Precolombino: Fray Ramón Pané y el universo Taíno,* Barcelona: Museo Barbier-Mueller/Fundacion Caixa Galicia.

Ollé, A. & J. M. Verges, 2008. SEM functional analysis and the mechanism of microwear formation, in *Prehistoric Technology' 40 years later: Functional Studies and the Russian Legacy. Proceedings of the International Congress Verona (Italy), 20-23 April 2005*, eds. L. Longo & N. Skakun. Oxford: Archaeopress, 39-49.

Ollé, A. & J. M. Vergès, 2014. The use of sequential experiments and SEM in documenting stone tool microwear. *Journal of Archaeological Science,* 48, 60-72.

Olsen, B., 2010. *In Defense of Things: Archaeology and the Ontology of Objects.* Lanham: Rowman & Littlefield Publishers.

Olsen Bogaert, H. & J. G. Atiles Bidó, 2004. Sitio arqueológico Playa Grande, Río San Juan, provincia María Trinidad Sánchez. *Boletín del Museo del Hombre Dominicano,* 37, 126-142.

Olsen, S. L., 1988. The identification of stone and metal toolmarks on bone artifacts, in *Scanning electron microscopy in archaeology*, ed. S. L. Olsen. Oxford: Archaeopress, 337-360.

Ortega, E. J., 1978a. Informe sobre investigacions arqueológicas realizidas en la region este del país, zona costera desde Macao a Punta Espada. *Boletin del Museo del Nombre Dominicano,* 11, 77-105.

Ortega, E. J., 1978b. Pieza del mes de junio de 1978. *Boletin del Museo del Nombre Dominicano,* 11, 285.

Ortega, E. J., 2001. *Los Objetos de Conchas de la Prehistoria de Santo Domingo.* Santo Domingo: Editora de Colores S.A.

Ortega, E. J., 2005. *Compendio general de arqueológico de Santo Domingo, Volumen I.* Santo Domingo: Publicaciones de Academia de Ciencas de República Dominicana.

Ortega, E. J. & G. Atiles, 2003. *Manantial de la Aleta y la Arqueología en el Parque Nacional del Este.* Santo Domingo: Editora View Graf.

Ostapkowicz, J., 2013. 'Made … With Admirable Artistry': The Context, Manufacture and History of a Taíno Belt. *The Antiquaries Journal,* 93, 287-317.

Ostapkowicz, J., 2015. Either a piece of domestic furniture of the Indians or one of their Gods. The study of Lucayan duhos. *Journal of Caribbean Archaeology,* 15, 62-101.

Ostapkowicz, J., 2018. New wealth from the Old World: glass, jet and mirrors in the late fifteenth to early sixteenth century indigenous Caribbean, in *Gifts, Goods and Money: Comparing currency and circulation systems in past societies*, eds. D. Brandherm, E. Heymans & D. Hofmann. Oxford: Archaeopress, 153-193.

Ostapkowicz, J., F. Brock, A. C. Wiedenhoeft, R. Schulting & D. Saviola, 2017. Integrating the Old World into the New: an 'Idol from the West Indies'. *Antiquity,* 91(359), 1314-1329.

Ostapkowicz, J., C. Bronk Ramsey, F. Brock, C. Cartwright, R. Stacey & M. Richards, 2013. Birdmen, cemís and duhos: material studies and AMS 14C dating of Pre-Hispanic Caribbean wood sculptures in the British Museum. *Journal of Archaeological Science,* 40(12), 4675-4687.

Ostapkowicz, J., C. Bronk Ramsey, F. Brock, T. Higham, A. C. Wiedenhoeft, E. Ribechini, J. J. Lucejko & S. Wilson, 2012. Chronologies in wood and resin: AMS 14C dating of pre-Hispanic Caribbean wood sculpture. *Journal of Archaeological Science,* 39(7), 2238-2251.

Ostapkowicz, J. & L. Newsom, 2012. "Gods... Adorned with the Embroiderer's Needle": The Materials, Making and Meaning of a Taino Cotton Reliquary. *Latin American Antiquity,* 23(3), 300-326.

Ostapkowicz, J., A. Wiedenhoeft, C. B. Ramsey, E. Ribechini, S. Wilson, F. Brock & T. Higham, 2011. 'Treasures… of black wood, brilliantly polished': five examples of Taíno sculpture from the tenth–sixteenth century Caribbean. *Antiquity,* 85(329), 942-959.

Outram, A. K., 2008. Introduction to experimental archaeology. *World Archaeology,* 40(1), 1-6.

Overing, J., 1989. The aesthetics of production: The sense of community among the Cubeo and Piaroa. *Dialectical Anthropology,* 14(3), 159-175.

Overing, J., 1990. The Shaman as a Maker of Worlds: Nelson Goodman in the Amazon. *Man (N.S.),* 25(4), 602-619.

Pagán-Jiménez, J. R., R. Rodríguez-Ramos, B. A. Reid, M. van den Bel & C. L. Hofman, 2015. Early dispersals of maize and other food plants into the Southern Caribbean and Northeastern South America. *Quaternary Science Reviews,* 123, 231-246.

Pailler, Y., 2005. Le sciage de la fibrolite en Armorique: approche technique, implications culturelles et symboliques, in *Unité et diversité des processus de néolithisation sur la façade atlantique de l'Europe (7e– 4e millénaire avant J.-C.)*, eds. G. Marchand & A. Tresset. Paris: la Société Préhistorique Française, 225-243.

Pailler, Y., 2009. Neolithic fibrolite working in the west of France, in *Materialitas: working stone, carving identity (9-10 march 2007, Dublin)*, eds. B. O'Connor, G. Cooney & J. Chapman. Oxford: Oxbow Books, 113-126.

Paleček, M. & M. Risjord, 2013. Relativism and the Ontological Turn within Anthropology. *Philosophy of the Social Sciences,* 43(1), 3-23.

Pané, F. R., 1974[1571]. *Relación acerca de las antigüedades de los Indios. Nueva versión con notas, mapa y apéndices por José Juan Arrom.* México: Siglo XXI Editores.

Pané, F. R., 1999. *An account of the Antiquities of the Indians: A new edition with an introductory study, notes, & appendices by José Juan Arrom.* Durham & London: Duke University Press.

Pantel, A. G., 1988. *Precolumbian Flaked Stone Assemblages in the West Indies.* Ph.D. dissertation. Knoxville: University of Tennessee.

Parry, J. H. & R. G. Keith (eds.), 1984. *New Iberian World: A documentary history of the discovery and settlement of Latin America to the early 17th Century. Volume II: The Caribbean,* New York: Times Books.

Pawlik, A. F. & J. P. Thissen, 2011. Hafted armatures and multi-component tool design at the Micoquian site of Inden-Altdorf, Germany. *Journal of Archaeological Science,* 38(7), 1699-1708.

Pearsall, D. M., 2002. Maize is *Still* Ancient in Prehistoric Ecuador: The View from Real Alto, with Comments on Staller and Thompson, in *Journal of Archaeological Science*, 51-55.

Pedergnana, A. & A. Ollé, 2017. Monitoring and interpreting the use-wear formation processes on quartzite flakes through sequential experiments. *Quaternary International,* 427, Part B, 35-65.

Pedergnana, A., A. Ollé, A. Borel & M.-H. Moncel, 2016. Microwear study of quartzite artefacts: preliminary results from the Middle Pleistocene site of Payre (South-eastern France). *Archaeological and Anthropological Sciences*, 1-20.

Pedersen, M. A., 2012. Common nonsense: A review of certain recent reviews of the "ontological turn". *Anthropology of this Century,* 5.

Pelegrin, J., C. Karlin & P. Bodu, 1988. Chaînes Opératoires: un Outil pour le Préhistorien, in *Technologie Préhistorique*, ed. J. Tixier. Paris: C.N.R.S.

Penard, A. P. & T. E. Penard, 1917. Popular Notions Pertaining to Primitive Stone Artifacts in Surinam. *The*

Journal of American Folklore, 30(116), 251-261.

Pendergast, D. M., E. Graham, R. J. Calvera & M. J. Jardines, 2002. The houses in which they dwelt: the excavation and dating of Taino wooden structures at Los Buchillones, Cuba. *Journal of Wetland Archaeology,* 2(1), 61-75.

Perlès, C., 2007. Echanges et technologie : l'exemple du Néolithique, in *Un siècle de construction du discours scientifique en préhistoire. XXVIe Congrès préhistorique de France, Congrès du centenaire de la Société préhistorique française, Avignon 21-25 septembre 2004*, eds. E. Jacques & T.-B. Emmanuelle. Paris: Société préhistorique française, 53-62.

Peters, E. D., 2001. Determining form and function: An analysis of use-related wear on *Strombus gigas* shell tools. *Lambda Alpha Journal,* 31, 28-37.

Petersen, J. B. & J. G. Crock, 2007. "Handsome Death": The Taking, Veneration, and Consumption of Human Remains in the Insular Caribbean and Greater Amazonia, in *The Taking and Displaying of Human Body Parts as Trophies by Amerindians*, eds. R. J. Chacon & D. H. Dye. Springer, 547-574.

Petitjean Roget, H., 1985. De l'arbre à pierre verte a propos d'une nouvelle acquisition de L'AGAE «Une Hache Emmanchée», in *Eleventh Congress of the International Association for Caribbean Archaeology*, eds. A. G. Pantel Tekakis, I. Vargas Arenas & M. Sanoja Obediente. San Juan, Puerto Rico: La Fundación, Arqueológica, Antropológica e Histórica de Puerto Rico, 75-84.

Petitjean Roget, H., 1997. Notes on ancient Caribbean art and mythology, in *The Indigenous People of the Caribbean*, ed. S. M. Wilson. Gainesvilel: University Press of Florida, 100-108.

Petitjean Roget, H., 2015a. *Archeologie des Petites Antilles: Chronologies, Art Céramique, Art Rupestre.* Association Internationale d'Archeologie de la Caraïbe.

Petitjean Roget, H., 2015b. *Les Tainos, Les Callinas des Antilles.* Association Internationale d'Archeologie de la Caraïbe.

Petitjean Roget, H. & D. Charles, 2015. Brève note sur le site Kallina de La Poterie, Grenade, in À la recherche du Caraïbe perdu: Les populations amérindiennes des Petites Antilles de l'époque précolombienne à la période coloniale, ed. B. Grunberg. Paris: L'Harmattan, 99-106.

Petitjean Roget, H., G. Richard & L. Sutty, 2000. *Pearls Amerindian Settlement. Grenada, East Caribbean. 1st Phase preliminary study and evaluation.*

Petitjean Roget, J., 1961. The Caribs as seen through the dictionary of the reverend Father Breton, in *First international Convention for the study of pre-Columbian culture in the Lesser Antilles. Fort-de-France, July 3 - 7, 1961*, eds. B. Marin & H. Theuvenin Fort-de-France: Société d'Histoire de la Martinique, 43-68.

Pétrequin, A.-M. & P. Pétrequin, 2012. Les modèles ethnoarchéologiques de Nouvelle-Guinée, in *Jade. Grandes haches alpines du Néolithique européen. V^{e} et IV^{e} millénaires av. J.-C.*, eds. P. Pétrequin, S. Cassen, M. Errera, L. Klassen, A. Sheridan & A.-M. Pétrequin. Besançon: Universitaires de Franche-Comté, 27-45.

Pétrequin, P., C. Bontemps, D. Buthod-Ruffier & N. Le Maux, 2012a. Approche expérimentale de la production des haches alpines, in *Jade. Grandes haches alpines du Néolithique européen. V^{e} et IV^{e} millénaires av. J.-C.*, eds. P. Pétrequin, S. Cassen, M. Errera, L. Klassen, A. Sheridan & A.-M. Pétrequin. Besançon: Universitaires de Franche-Comté, 258-291.

Pétrequin, P., S. Cassen, M. Errera, L. Klassen, A.-M. Pétrequin & A. Sheridan, 2013. The value of things: The production and circulation of Alpine jade axes during the 5th – 4th millenia in a European perspective, in *Economic archaeology: from structure to performance in European archaeology*, eds. T. Kerig & A. Zimmermann. Bonn: Habelt, 65-82.

Pétrequin, P., S. Cassen, M. Errera, L. Klassen, A. Sheridan & A. M. Pétrequin (eds.), 2012b. *Jade, grandes* *haches alpines du Néolithique européen V^e^ et IV^e^ millénaires av. J.-C,* Besançon; Gray: Presses Universitaires de Franche-Comté; Centre de recherche archéologique de la Vallée de l'Ain.

Pétrequin, P., S. Cassen, E. Gauthier, L. Klassen, Y. Pailler, A. Sheridan, J. Desmeulles, P.-A. Gillioz, N. Le Maux, A. Milleville, A.-M. Pétrequin, F. Prodéo, A. Samzun & R. Fabregas Valcarce, 2012c. Typologie, chronologie et répartition des grandes haches alpines en Europe occidentale, in *Jade. Grandes haches alpines du Néolithique européen. V^e^ et IV^e^ millénaires av. J.-C.*, eds. P. Pétrequin, S. Cassen, M. Errera, L. Klassen, A. Sheridan & A.-M. Pétrequin. Besançon: Universitaires de Franche-Comté, 574-727.

Pétrequin, P., M. Errera, A. M. Pétrequin & E. Gauthier, 2009. Une production du Mont Viso en Italie: l'ébauche de haches de Lugrin (Haute–Savoie, France), in *De la Méditerranée et d'ailleurs. Mélanges offerts à Jean Guilaine*Toulouse: Archives d'ecologie préhistorique, 583-595.

Pétrequin, P. & C. Jeunesse (eds.), 1995. *La Hache de Pierre: Carrières vosgiennes et échanges de lames polies pendant le Néolithique (5400-2100 av. J.-C.),* Paris: Editions Errance.

Pétrequin, P. & A.-M. Pétrequin, 1993. Écologie d›un outil: La hache de pierre en Irian Jaya (Indonésie). Paris: CNRS Éditions.

Pétrequin, P. & A.-M. Pétrequin, 2011. The twentieth-century polished stone axeheads of New Guinea: why study them?, in *Stone axe studies III*, eds. V. Davis & M. Edmonds. Oxford: Oxbow Books, 333-349.

Pétrequin, P. & A.-M. Pétrequin, 2016. The Production and Circulation of Alpine Jade Axe-Heads during the European Neolithic: Ethnoarchaeological Bases of Their Interpretation, in *The Intangible Elements of Culture in Ethnoarchaeological Research*, eds. S. Biagetti & F. Lugli. Cham: Springer International Publishing, 47-76.

Pétrequin, P., A.-M. Pétrequin, M. Errera, O. J. Riveron, M. Bailly, E. Gauthier & G. Rossi, 2008. Premiers épisodes de la fabrication des longues haches alpines : Ramassage de Galet ou Choc Thermique Sur des Blocs? *Bulletin de la société Préhistorique Française,* 105(2), 309-334.

Pfleging, J., M. Stücheli, R. Iovita & J. Buchli, 2015. Dynamic Monitoring Reveals Motor Task Characteristics in Prehistoric Technical Gestures. *PLoS ONE,* 10(8), e0134570.

Piñeda Camacho, R., 1975. La Gente del Hacha: Breve historia de la tecnología según una tribu Amazónica. *Revista Colombiana de antropología,* 19, 435-478.

Pittier, H. & C. D. Mell, 1931. *A century of trees of Panama / described by H. Pittier and C.D. Mell.*

Plisson, H., 1983. De la conservation des micro-polis d'utilisation. *Bulletin de la société Préhistorique Française,* 8, 74-77.

Plisson, H., 1985. *Etude foncionnelle d´outillages lithiques préhistoriques par l´analyse des micro-usures: recherche méthodologique et archéoloqique.* Universitée de Paris I, Pantheon Sorbonne.

Plisson, H. & M. Mauger, 1988. Chemical and mechanical alteration of microwear polishes. An experimental approach. *Helinium,* 28(1), 3-16.

Plisson, H. & A. L. Van Gijn, 1989. La tracéologie: mode d'emploi. *L'Anthropologie,* 93(3), 631-642.

Plomp, E., 2013. *Dogs on the move.* MA (Research) thesis. Leiden: Leiden University, Faculty of Archaeology.

Politis, G. G., 2007. *Nukak: Ethnoarchaeology of an Amazonian people.* Walnut Creek: Left Coast Press.

Pollard, A. M. & P. Bray, 2007. A Bicycle Made for Two? The Integration of Scientific Techniques into Archaeological Interpretation. *Annual Review of Anthropology,* 36(1), 245-259.

Pollard, A. M., P. J. Bray & C. Gosden, 2014. Is there something missing in scientific provenance studies of prehistoric artefacts? *Antiquity,* 88(340), 625-631.

Pomstra, D. & A. L. Van Gijn, 2013. The reconstruction of a Late-Neolithic house: Combining primitive technology and science. *Bulletin of Primitive Technology,* 45, 45-54.

Pons Alegría, M., 1979. The use of masks, spectacles and eye-piees among the Antillean aborigines, in *Eighth International Congress for the Study of Pre-Columbian Cultures in the Lesser Antilles*, ed. S. Lewenstein. St. Kitts: Arizona State University, 578-592.

Potts, R. & P. Shipman, 1981. Cutmarks made by stone tools on bones from Olduvai Gorge, Tanzania. *Nature,* 29, 577-580.

Powis, T. G., S. Horn Iii, G. Iannone, P. F. Healy, J. F. Garber, J. J. Awe, S. Skaggs & L. A. Howie, 2016. Middle Preclassic period Maya greenstone "triangulates": Forms, contexts, and geology of a unique Mesoamerican groundstone artifact type. *Journal of Archaeological Science: Reports,* 10, 59-73.

Price, M. F., 2012. *Ritual crafting, power, and the organization of shell ornament production at Cerro de Trincheras, Sonora, Mexico.* Ph.D. Binghamton: State University of New York.

Procopiou, H., A. Boleti, R. Vargiolu & H. Zahouani, 2011. The role of tactile perception during stone-polishing in Aegean prehistory (5th–4th millennium B.C.). *Wear,* 271(9–10), 2525-2530.

Procopiou, H., E. Morero, R. Vargiolu, M. Suarez-Sanabria & H. Zahouani, 2013. Tactile and visual perception during polishing: an ethnoarchaeological study in India (Mahabalipuram, Tamil Nadu). *Wear,* 301(1–2), 144-149.

Proskouriakoff, T., 1974. Jades From the Cenote of Sacrifice Chichen Itza, Yucatan. *Memoirs of the Peabody Museum of Archaeology and Ethnology,* 10(1).

Raemaekers, D. C. M., J. Geuverink, M. Schepers, B. P. Tuin, E. van der Lagemaat & M. van der Wal, 2011. *A biography in stone: typology, age, function and meaning of early neolithic perforated wedges in the Netherlands.* Groningen: Barkhuis.

Ragolta, J. A. i., 2008. Fray Ramón Pané: primicia de América, in *El Caribe Precolombino: Fray Ramón Pané y el universo Taíno*, eds. J. R. Oliver, C. McEwan & A. C. Gilberga. Barcelona: Museo Barbier-Mueller and Fundacion Caixa Galicia, 34-55.

Ragsdale, C. S., H. J. H. Edgar & E. Melgar, 2016. Origins of the Skull Offerings of the Templo Mayor, Tenochtitlán. *Current Anthropology,* 57(3), 357-369.

Rainey, F. G., 1940. Porto Rican Archaeology, in *Scientific Survey of Porto Rico and the Virgin Islands,* New York: Academy Press, 154-161.

Ramos, A. R., 2012. The Politics of Perspectivism. *Annual Review of Anthropology,* 41(1), 481-494.

Reid, B. A., 2009. *Myths and Realities of Caribbean History.* Tuscaloosa: University of Alabama Press.

Reid, B. A. (ed.) 2018. *The Archaeology of Caribbean and circum-Caribbean farmers 600 BC-AD 1500,* London and New York: Routledge.

Ribeiro, B. G., 1988. *Dicionário do Artesanato Indígena.* São Paulo: Editora da Universidade de São Paulo.

Righter, E., 2002. Post Hole Patterns: Structures, Chronology and Spatial Distribution at the Tutu Site (Ch.12), in *The Tutu archaeological village site : a multidisciplinary case study in human adaptation*, ed. E. Righter. Routledge, 284-353.

Risch, R. & F. Martínez Fernández, 2008. Dimensiones naturales y sociales de la producción de hachas de piedra en el noreste de la península Ibérica. *Trabajos de Prehistoria,* 65(1), 47-71.

Rivera Fontán, J. & J. R. Oliver, 2003. Impactos Y Patrones De Ocupación Histórica Jíbara Sobre Componentes Taínos: El Sitio 'Vega De Nelo Vargas' (Utu-27), Barrio Caguana, Municipio De Utuado, Puerto Rico, in *Twentieth International Congress for Caribbean Archaeology*, eds. C. Tavárez María & M. A. García Arévalo. Santo Domingo, Dominican Republic: Museo del Hombre Dominicano & Fundación García Arévalo, 1-14.

Rivière, P. G., 1969. Myth and material culture: some symbolic interrelations, in *Forms of Symbolic Action:*

Proceedings of the 1969 annual spring meeting of the American Ethnological Society, ed. R. F. Spencer. Seattle and London: University of Washington Press, 151-166.

Robinson, M., J. Iriarte, J. G. De Souza, O. Marozzi & R. Scheel-Ybert, 2017. Moiety specific wood selection in funerary ritual for the southern proto-Jê. *Journal of Archaeological Science: Reports,* 11, 237-244.

Rodríguez Lopez, M., 1985. Arqueología del Río Loiza, in *Eleventh Congress of the International Association for Caribbean Archaeology*, eds. A. G. Pantel Tekakis, I. Vargas Arenas & M. Sanoja Obediente. San Juan, Puerto Rico: La Fundación, Arqueológica, Antropológica e Histórica de Puerto Rico, 287-294.

Rodríguez Lopez, M., 1991. Early trade networks in the Caribbean, in *14th International Congress for Caribbean Archaeology*, eds. A. Cummins & P. King. Dover Convention Centre, Barbados: Barbados Museum and Historical Society, 306-314.

Rodríguez López, M., 2007. *Tras las Huellas del Perro Indígena : Estudio arqueológico del llamado perro "mudo" de nuestros indios Taínos.* Hato Rey: Publicaciones Puertorriqueñas.

Rodríguez Ramos, R., 2001. *Lithic reduction trajectories at La Hueca and Punta Candelero sites, Puerto Rico.* MA thesis. Houston: Texas A&M University.

Rodríguez Ramos, R., 2005a. The crab-shell dichotomy revisited: The lithics speak out, in *Ancient Borinquen: Archaeology and ethnohistory of native Puerto Rico*, ed. P. E. Siegel. Tuscaloosa: University of Alabama Press, 1-54.

Rodríguez Ramos, R., 2005b. The function of the edge-ground cobble put to the test: An initial assessment. *Journal of Caribbean Archaeology,* 6, 1-22.

Rodríguez Ramos, R., 2007. *Puerto Rican precolonial history etched in stone.* Ph.D. Dissertation. Gainesville: University of Florida.

Rodríguez Ramos, R., 2010a. *Rethinking Puerto Rican Precolonial History.* Tuscaloosa: University of Alabama Press.

Rodríguez Ramos, R., 2010b. What is the Caribbean? An archaeological perspective. *Journal of Caribbean Archaeology,* 9(Special Publication #3), 19-51.

Rodríguez Ramos, R., 2011a. The circulation of jadeitite across the Caribbeanscape, in *Communities in Contact: Essays in archaeology, ethnohistory & ethnography of the Amerindian circum-Caribbean*, eds. C. L. Hofman & A. v. Duijvenbode. Leiden: Sidestone Press, 117-136.

Rodríguez Ramos, R., 2011b. Close encounters of the Caribbean kind, in *Islands at the Crossroads: Migration, Seafaring, and Interaction in the Caribbean*, eds. L. A. Curet & M. W. Hauser. Tuscaloosa: University of Alabama Press, 164-192.

Rodríguez Ramos, R., 2013. Ishtmo-Antillean engagements, in *The Oxford Handbook of Caribbean Archaeology*, eds. W. F. Keegan, C. L. Hofman & R. Rodríguez Ramos. Oxford: Oxford University Press, 155-170.

Rodríguez Ramos, R., E. Babilonia, L. A. Curet & J. Ulloa Hung, 2008. The Pre-Arawak Pottery Horizon in the Antilles: A New Approximation. *Latin American Antiquity,* 19(1), 47-63.

Rodríguez Ramos, R., J. Pagán Jiménez, J. Santiago-Blay, J. B. Lambert & P. R. Craig, 2013. Some indigenous uses of plants in pre-Columbian Puerto Rico. *Life: The Excitement of Biology,* 1(1).

Roe, P. G., 1982. *The Cosmic Zygote: Cosmology in the Amazon Basin.* New Brunswick: Rutgers University Press.

Roe, P. G., 1989. The best enemy is a defunct, drilled and decorative enemy: Human corporeal art (Frontal bone pectorals - belt ornaments, carved humeri and pierced teeth) in Precolombian Puerto Rico, in *13th International Congress for Caribbean Archaeology*, eds. E. N. Ayubi & J. Haviser. Willemstad, Curaçao, 854-873.

Roe, P. G., 1993. Eternal Companions: Amerindian Dogs from Tierra Firma to the Antilles, in *15th International*

Congress for Caribbean Archaeology. San Juan, Puerto Rico, 155-172.

Roe, P. G., 1997. Just wasting away: Taíno shamanism and concepts of fertility, in *Taíno: Pre-Columbian art and culture from the Caribbean*, eds. F. Bercht, E. Brodsky, J. A. Farmer & D. Taylor. New York: Monacelli Press, 124-157.

Roe, P. G., 2013. Recycling the sacred: The petroglyphs of Jacana (PO-29), Ponce, in *25th International Congress for Caribbean Archeology*, ed. L. Del Olmo. San Juan: Instituto de Cultura Puertorriqueña/Centro de Estudios Avanzados de Puerto Rico y el Caribe/Universidad de Puerto Rico, 158-186.

Roe, P. G., A. G. Pantel & M. B. Hamilton, 1985. Monserrate restudied: The 1978 Centro field season at Luquillo Beach: Excavation overview, lithics and physical anthropological remains, in *Eleventh Congress of the International Association for Caribbean Archaeology*, eds. A. G. Pantel Tekakis, I. Vargas Arenas & M. Sanoja Obediente. San Juan, Puerto Rico: La Fundación, Arqueológica, Antropológica e Histórica de Puerto Rico, 338-369.

Roksandic, I., 2016. The Role of the Nicaraguan Rise in the Early Peopling of the Greater Antilles, in *Cuban archaeology in the Caribbean*, ed. I. Roksandic. Gainesville: University Press of Florida, 7-16.

Romagnoli, F., J. Baena & L. Sarti, 2016. Neanderthal retouched shell tools and Quina economic and technical strategies: An integrated behaviour. *Quaternary International,* 407, Part B, 29-44.

Romon, T. (ed.), 2017. *Anse Bellay (972), D'un cimetière d'esclaves à un site précolombien multiphasé: Une opération d'évaluation archéologique à l'anse Bellay*. Inrap GSO (Rapport de fouille).

Roobol, M. J. & J. W. Lee, 1975. Petrography and source of some Arawak rock artifacts from Jamaica, in *VIth International Congress for the Study of pre-Columbian Cultures in the Lesser Antilles*, ed. R. P. Bullen. Pointe à Pitre, Guadeloupe: Florida State Museum, 304-313.

Rose, T. R. & J. M. Walsh, 2016. The stone faces of Teotihuacan: Insights into their use, manufacture and sources. *Journal of Archaeological Science: Reports,* in press.

Rosenberg, D., R. Shimelmitz & A. Nativ, 2008. Basalt bifacial tool production in the southern Levant: a glance at the quarry and workshop site of Giv'at Kipod, Israel. *Antiquity,* 82(316), 367-376.

Rostain, S., 1986/1990. Etude d'une Chaine Operatoire: les haches em pierre polie d'Amazonie. *Arquivos do Museu de História Natural da UFMG,* 11, 195-237.

Rostain, S., 1994. *L'occupation amérindienne ancienne du littoral de Guyane.* Paris: Editions de l'Orstom.

Rostain, S., 1997. Tanki Flip stone material, in *The Archaeology of Aruba: The Tanki Flip site*, eds. A. H. Versteeg & S. Rostain. Aruba & Amsterdam: Archaeological Museum Aruba, 221-250.

Rostain, S., A. H. Versteeg & J. Pélegrin, 2005. Manufacture of stone tools at the Coashiati site, Aruba, in *XXI Congress of the International Association for Caribbean Archaeology*, eds. B. A. Reid, H. Petitjean Roget & L. A. Curet. St. Augustine: School of Continuing Studies, University of the West Indies, 218-225.

Rostain, S. & Y. Wack, 1987. Haches et herminettes en pierre de Guyane française. *Journal de la Société des Américanistes*, 107-138.

Roth, W. E., 1924. An introductory study of the arts, crafts, and customs of the Guiana Indians, in *Thirty-eighth Annual Report of the Bureau of American Ethnology to the secretary of the Smithsonian Institute, 1916-1917*, ed. F. W. Hodge. Washington: Government Printing Office, 25-745.

Rots, V., 2003. Towards an understanding of hafting: the macro- and microscopic evidence. *Antiquity,* 77, 805-815.

Rots, V., 2005. Wear traces and the interpretation of stone tools. *Journal of Field Archaeology,* 30(1), 61-73.

Rots, V., 2008. Hafting traces on flint tools, in *Prehistoric Technology' 40 years later: Functional Studies and the Russian Legacy. Proceedings of the International Congress Verona (Italy), 20-23 April 2005*, eds. L. Longo &

N. Skakun. Oxford: Archaeopress, 75-84.

Rots, V., 2010. *Prehension and hafting traces on flint tools. A methodology.* Leuven: Leuven University Press.

Rots, V., L. Pirnay, P. Pirson & O. Baudoux, 2006. Blind tests shed light on possibilities and limitations for identifying stone tool prehension and hafting. *Journal of Archaeological Science,* 33(7), 935-952.

Rots, V. & H. Plisson, 2014. Projectiles and the abuse of the use-wear method in a search for impact. *Journal of Archaeological Science,* 48, 154-165.

Rots, V. & P. M. Vermeersch, 2004. Experimental characterization of hafting traces and their recognition in archaeological assemblages, in *Lithics in Action: Papers from the conference Lithic Studies in the Year 2000*, eds. E. A. Walker, F. Wenban-Smith & F. Healy. Oxford: Oxbow Books, 156-168.

Rots, V. & B. S. Williamson, 2004. Microwear and residue analyses in perspective: the contribution of ethnoarchaeological evidence. *Journal of Archaeological Science,* 31(9), 1287-1299.

Rouse, I. B., 1986. *Migrations in Prehistory: Inferring population movement from cultural remains.* New Haven: Yale University Press.

Rouse, I. B., 1992. *The Taino: Rise and decline of the people who greeted Columbus.* New Haven and London: Yale University Press.

Rouse, I. B. & J. M. Cruxent, 1963. Venezuelan Archaeology, in *Venezualan Archaeology.* New Haven: Yale University Press, 1-179.

Roux, V., B. Bril, J. Cauliez, A.-L. Goujon, C. Lara, C. Manen, G. de Saulieu & E. Zangato, 2017. Persisting technological boundaries: Social interactions, cognitive correlations and polarization. *Journal of Anthropological Archaeology,* 48, 320-335.

Rüdebeck, E., 1998. Flint extraction, axe offering, and the value of cortex, in *Understanding the Neolithic of north-western Europe*, eds. M. Edmonds & C. Richards. Glasgow: Cruithne Press, 312-327.

Ruiter, S. d., 2009. *Shell material from El Cabo, Dominican Republic: Functional and typological analysis of the shell artefacts from the Late Ceramic site of El Cabo.* BA Thesis. Leiden: Leiden University, Faculty of Archaeology.

Safa, E., J.-B. Barreau, R. Gaugne, W. Duchemin, J.-D. Talma, B. Arnaldi, G. Dumont & V. Gouranton, 2016. Digital and Handcrafting Processes Applied to Sound-Studies of Archaeological Bone Flutes, in *Digital Heritage. Progress in Cultural Heritage: Documentation, Preservation, and Protection: 6th International Conference, EuroMed 2016, Nicosia, Cyprus, October 31 – November 5, 2016, Proceedings, Part I*, eds. M. Ioannides, E. Fink, A. Moropoulou, M. Hagedorn-Saupe, A. Fresa, G. Liestøl, V. Rajcic & P. Grussenmeyer. Cham: Springer International Publishing, 184-195.

Salisbury, R. F., 1962. *From Stone to Steel.* Melbourne: Melbourne University Press.

Samson, A. V. M., 2010. *Renewing the House: Trajectories of Social Life in the Yucayeque (community) of El Cabo, Higüey, Dominican Republic, AD 800 to 1504.* Leiden: Sidestone Press.

Samson, A. V. M., 2011. The most beautiful house in the world: The archaeology of aesthetics in eastern Hispaniola, in *Communities in Contact: Essays in archaeology, ethnohistory, & ethnography of the Amerindian circum-Caribbean*, eds. C. L. Hofman & A. v. Duijvenbode. Leiden: Sidestone Press, 421-438.

Samson, A. V. M. & M. L. P. Hoogland, 2007. Residencia taína: Huellas de asentamiento en El Cabo, República Dominicana. *El Caribe Arqueológico,* 10, 93-103.

Samson, A. V. M. & B. M. Waller, 2010. Not Growling but Smiling: New Interpretations of the Bared-Teeth Motif in the Pre-Columbian Caribbean. *Current Anthropology,* 51(3), 425-433.

Sanjek, R., 1991. The Ethnographic Present. *Man (N.S.),* 26(4), 609-628.

Santos-Granero, F., 2009a. From baby slings to feather bibles and from star utensils to jaguar stones: The multiple ways of being a thing in the Yanesha lived world, in *The Occult Life of Things: Native Amazonian theories of materiality and personhood*, ed. F. Santos-Granero. Tucson: The University of Arizona Press, 105-127.

Santos-Granero, F., 2009b. Introduction: Amerindian constructional views of the world, in *The Occult Life of Things: Native Amazonian theories of materiality and personhood*, ed. F. Santos-Granero. Tucson: The University of Arizona Press, 1-29.

Santos-Granero, F. (ed.) 2009c. *The Occult Life of Things: Native Amazonian theories of materiality and personhood,* Tucson: University of Arizona Press.

Santos-Granero, F., 2012. Beinghood and people-making in native Amazonia: A constructional approach with a perspectival coda. *HAU: Journal of Ethnographic Theory,* 2(1), 181-211.

Sassaman, K. E. & W. Rudolphi, 2001. Communities of Practice in the Early Pottery Traditions of the American Southeast. *Journal of Anthropological Research,* 57(4), 407-425.

Saunders, J. B., D. Bernoulli & P. H. A. Martin-Kaye, 1995. Late Eocene deep-water clastics in Grenada, West Indies. *Eclogae Geologicae Helvetiae,* 78(3), 469-485.

Saunders, N. J., 1999. Biographies of Brilliance: Pearls, Transformations of Matter and being, c. AD 1492. *World Archaeology,* 31(2), 243-257.

Saunders, N. J., 2001. A dark light: Reflections on obsidian in Mesoamerica. *World Archaeology,* 33(2), 220-236.

Saunders, N. J., 2003. "Catching the light": technologies of power and enchantment in pre-Columbian goldworking, in *Gold and Power in ancient Costa Rica, Panama, and Colombia*, eds. J. Quilter & J. W. Hoopes. Washington: Dumbarton Oaks, 15-47.

Saunders, N. J., 2004. The cosmic earth: Materiality and mineralogy in the Americas, in *Soils, Stones, and Symbols: Cultural Perceptions of the Mineral World* eds. N. Boivin & M. A. Owoc. London: UCL Press, 123-141.

Saunders, N. J. & D. Gray, 1996. Zemís, trees, and symbolic landscapes: three Taíno carvings from Jamaica. *Antiquity,* 70(270), 801-812.

Saville, M. H., 1916. Monolithic axes and their distribution in ancient America. *Contributions from the Museum of the American Indian,* 2(6), 1-13.

Sax, M. & K. Ji, 2013. The technology of jades excavated at the Western Zhou, Jin Marquis cemetery, Tianma-Qucun, Beizhao, Shanxi province: recognition of tools and techniques. *Journal of Archaeological Science,* 40(2), 1067-1079.

Sax, M., J. McNabb & N. D. Meeks, 1998. Methods of engraving Mesopotamian cylinder seals: Experimental confirmation. *Archaeometry,* 40(1), 1-21.

Sax, M. & N. D. Meeks, 1994. The introduction of wheel cutting as a technique for engraving cylinder seals: its distinction from filing. *Iraq,* 56, 153-166.

Sax, M. & N. D. Meeks, 1995. Methods of engraving Mesopotamian quartz cylinder seals. *Archaeometry,* 37(1), 25-36.

Sax, M., N. D. Meeks, C. Michaelson & A. P. Middleton, 2004. The identification of carving techniques on Chinese jade. *Journal of Archaeological Science,* 31(10), 1413-1428.

Scaramelli, F. & K. T. d. Scaramelli, 2005. The roles of material culture in the colonization of the Orinoco,Venezuela. *Journal of Social Archaeology,* 5(1), 135-168.

Schats, R., 2011. In sickness and in health: Possibilities for studying the social and cultural implications of treponemal disease in the Caribbean area, in *Communities in Contact: Essays in archaeology, ethnohistory*

& ethnography of the Amerindian circum-Caribbean, eds. C. L. Hofman & A. Van Duijvenbode. Leiden: Sidestone Press, 269-279.

Schertl, H.-P., W. V. Maresch, S. Knippenberg, A. Hertwig, A. López Belando, R. Rodríguez Ramos, L. Speich & C. L. Hofman, 2018. Petrography, mineralogy and geochemistry of jadeite-rich artefacts from the Playa Grande excavation site, northern Hispaniola: evaluation of local provenance from the Río San Juan Complex. *Geological Society, London, Special Publications,* 474.

Schertl, H.-P., W. V. Maresch, K. P. Stanek, A. Hertwig, M. Krebs, R. Baese & S. S. Sergeev, 2012. New occurrences of jadeitite, jadeite quartzite and jadeite-lawsonite quartzite in the Dominican Republic, Hispaniola: petrological and geochronological overview. *European Journal of Mineralogy,* 24(2), 199-216.

Schiffer, M. B., 1995. *Behavioral Archaeology: First Principles.* Salt Lake City: University of Utah Press.

Schiffer, M. B., 2011. *Behavioral Archaeology.* New York: Academic Press.

Schiffer, M. B. & V. M. LaMotta, 2007. Behavioral archaeology and formation processes, in *Formation Processes and Indian Archaeology*, eds. K. Paddayya, R. Jhaldiyal & S. G. Deo. Pune: Deccan Collete Post-Graduate and Research Institute, 3-14.

Schiffer, M. B. & A. R. with Miller, 1999. *The material life of human beings: artifacts, behavior, and communication.* New York: Routledge.

Schmidt, P. R., 2010. The play of tropes in archaeology: Ethnoarchaeology as metonymy. *Ethnoarchaeology,* 2, 131-152.

Schneider, J. S., 2002. Milling Tool Design, Stone Textures, and Function, in *Moudre et Broyer. L' interprétation fonctionnelle de l'outillage de mouture et de broyage dans la Préhistoire et l'Antiquité. I. Méthodes. Pétrographie, chimie, tracéologie, expérimentation, ethnoarchéologie*, eds. H. Procopiou & R. Treuil. Paris: CTHS, 31-53.

Schneider, J. S. & P. C. LaPorta, 2008. Geological constraints on ground stone production and consumption in the Southern Levant, in *New Approaches to Old Stones: Recent studies of ground stone artifacts*, eds. Y. M. Rowan & J. R. Ebeling. London: Equinox, 19-40.

Schoch, W. H., G. Bigga, U. Böhner, P. Richter & T. Terberger, 2015. New insights on the wooden weapons from the Paleolithic site of Schöningen. *Journal of Human Evolution,* 89, 214-225.

Schroeder, H., M. Sikora, S. Gopalakrishnan, L. M. Cassidy, P. Maisano Delser, M. Sandoval Velasco, J. G. Schraiber, S. Rasmussen, J. R. Homburger, M. C. Ávila-Arcos, M. E. Allentoft, J. V. Moreno-Mayar, G. Renaud, A. Gómez-Carballa, J. E. Laffoon, R. J. A. Hopkins, T. F. G. Higham, R. S. Carr, W. C. Schaffer, J. S. Day, M. Hoogland, A. Salas, C. D. Bustamante, R. Nielsen, D. G. Bradley, C. L. Hofman & E. Willerslev, 2018. Origins and genetic legacies of the Caribbean Taino. *Proceedings of the National Academy of Sciences*.

Scott, R. B., B. Neyt, C. L. Hofman & P. Degryse, 2018. Determining the Provenance of Cayo Pottery from Grenada, Lesser Antilles, Using Portable X-Ray Fluorescence Spectrometry. *Archaeometry,* 60(5), 966-985.

Sears, W. H. & S. O. Sullivan, 1978. Bahamas Prehistory. *American Antiquity,* 43(1), 3-25.

Seitzer Olausson, D., 1980. Starting from scratch: the history of edge-wear research from 1838 to 1978. *Lithic Technology,* 9(2), 48-60.

Sellet, F., 1993. Chaine operatoire: the concept and its applications. *Lithic Technology,* 18(1&2), 106-112.

Semenov, S. A., 1964. *Prehistoric Technology, an experimental study of the oldest tools and artefacts from traces of manufacture and wear.* London: Cory, Adams & Mackay.

Serrand, N., 1997. Tanki Flip shell artefacts with a relatively high level of modification, in *The Archaeology of Aruba: The Tanki Flip site*, eds. A. H. Versteeg & S. Rostain. Aruba & Amsterdam: Archaeological Museum Aruba, 189-217.

Serrand, N. & K. S. Cummings, 2014. 6 - Occurrences of exogenous freshwater mussel shells (Bivalvia: Unionoida) during the Precolumbian Ceramic Age of the Lesser Antilles, in *Archaeomalacology: Shells in the Archaeological Record*, eds. K. A. Szabó, C. Dupont, V. Dimitrijević, L. Gómez Gastélum & N. Serrand. Oxford: Archaeopress, 65-75.

Shafie, T., D. Schoch, J. Mans, C. Hofman & U. Brandes, 2017. Hypergraph Representations: A Study of Carib Attacks on Colonial Forces, 1509-1700. *Journal of Historical Network Research,* (1), 52-70.

Shanks, M., 1998. The life of an artefact in an interpretive archaeology. *Fennoscandia Archaeologica,* 15, 15-30.

Shea, J. J. & J. D. Klenck, 1993. An experimental investigation of the effects of trampling on the results of lithic microwear analysis. *Journal of Archaeological Science,* 20, 175-194.

Sheridan, A., 2011. Old friends, new friends, a long-lost friend and false friends: Tales from Projet JADE, in *Stone Axe Studies III*, eds. V. Davis & M. Edmonds. Oxford: Oxbow Books, 411 - 426.

Shev, G., 2018. *Feeding* Opiyelguobirán*: A multidisciplinary analysis of human-canid relations in pre-colonial Hispaniola.* MA (research) thesis. Leiden: Leiden University, Faculty of Archaeology.

Shott, M. J., 1996. An Exegesis of the Curation Concept. *Journal of Anthropological Research,* 52(3), 259-280.

Sickler Robinson, L., 1977. Modified oliva shells from the Virgin Islands: a morphological study, in *Seventh International Congress for the Study of pre-Columbian Cultures of the Lesser Antilles*, eds. J. Benoist & F.-M. Mayer. Caracas: Centre de Recherches Caraïbes, 169-187.

Sickler Robinson, L., 1979. The crab motif in aboriginal West Indian shellwork, in *Eighth International Congress for the Study of Pre-Columbian Cultures in the Lesser Antilles*, ed. S. Lewenstein. St. Kitts: Arizona State University, 187-194.

Siegel, P. E. (ed.) 1989. *Early Ceramic Population Lifeways and Adaptive Strategies in the Caribbean,* Oxford: Archaeopress.

Siegel, P. E., 1992. *Ideology, power, and social complexity in prehistoric Puerto Rico.* Ph.D. Binghamton: State University of New York.

Siegel, P. E., 2004. What happened after AD 600 on Puerto Rico? Corporate groups, population restructuring, and post-Saladoid social changes, in *Late Ceramic Age Societies in the Eastern Caribbean*, eds. A. Delpuech & C. L. Hofman. Oxford: Archaeopress, 87-100.

Siegel, P. E., 2010. Continuity and change in the evolution of religion and political organization on pre-Columbian Puerto Rico. *Journal of Anthropological Archaeology,* 29(3), 302-326.

Siegel, P. E., J. G. Jones, D. M. Pearsall, N. P. Dunning, P. Farrell, N. A. Duncan, J. H. Curtis & S. K. Singh, 2015. Paleoenvironmental evidence for first human colonization of the eastern Caribbean. *Quaternary Science Reviews,* 129, 275-295.

Siegel, P. E. & P. G. Roe, 1986. Shipibo Archaeo-ethnography: Site Formation Processes and Archaeological Interpretation. *World Archaeology,* 18(1), 96-115.

Sillar, B. & M. S. Tite, 2000. The challenge of 'technological choices' for materials science approaches in archaeology. *Archaeometry,* 42(1), 18.

Skeates, R., 1995. Animate objects: a biography of prehistoric 'axe-amulets' in the central Mediterranean region. *Proceedings of the Prehistoric Society,* 61, 279-301.

Skeates, R., 2002. Axe aesthetics: stone axes and visual culture in prehistoric Malta. *Oxford Journal of Archaeology,* 21(1), 13-22.

Slayton, E. R., 2018. *Seascape Corridors: Modeling Routes to Connect Communities Across the Caribbean Sea.* Leiden: Sidestone Press.

Sliva, J. R. & L. H. Keeley, 1994. "Frits" and specialized hide preparation in the Belgian Early Neolithic. *Journal* *of Archaeological Science,* 21, 91-99.

Šmit, Ž., G. W. Grime, S. Petru & I. Rajta, 1999. Microdistribution and composition of usewear polish on prehistoric stone tools. *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms,* 150(1), 565-570.

Šmit, Ž., S. Petru, G. Grime, T. Vidmar, M. Budnar, B. Zorko & M. Ravnikar, 1998. Usewear-induced deposition on prehistoric flint tools. *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms,* 140(1), 209-216.

Smith, K. N., S. K. T. S. Wärmländer, R. L. Vellanoweth, C. M. Smith & W. E. Kendig, 2015. Residue analysis links sandstone abraders to shell fishhook production on San Nicolas Island, California. *Journal of Archaeological Science,* 54, 287-293.

Solís Ciriaco, R. B., E. Melgar Tísoc & L. S. Lowe, 2016. Análisis tecnológico de las hachas de piedra verde de Chiapa de Corzo, in *XXIX Ximposio de Investigaciones Arqueologicas en Guatemala, 2015*, eds. B. Arroyo, L. M. Salinas & G. A. Álvarez. Ciudad de Guatemala: Ministerio de Cultura y Deportes Instituto de Antropología e Historia Asociación Tíkal, 1087-1097.

Sorensen, A. C., E. Claud & M. Soressi, 2018. Neandertal fire-making technology inferred from microwear analysis. *Scientific Reports,* 8(1), 10065.

Speed, R. C., P. L. Smith-Horowitz, K. V. S. Perch-Nielsen, J. B. Saunders & A. B. Sanfilippo, 1993. Southern Lesser Antilles arc platform: Pre-Late Miocene stratigraphy, structure, and tectonic evolution. *Geological Society of America,* Special Paper 277, 1-98.

Stark, M. T. (ed.) 1998. *The Archaeology of Social Boundaries,* Washington / London: Smithsonian Institution Press.

Steadman, D. W., P. S. Martin, R. D. E. MacPhee, A. J. T. Jull, H. G. McDonald, C. A. Woods, M. Iturralde-Vinent & G. W. L. Hodgins, 2005. Asynchronous extinction of late Quaternary sloths on continents and islands. *Proceedings of the National Academy of Sciences of the United States of America,* 102(33), 11763.

Stedman, J. G., 1806. *Narrative, of a five years' expedition, against the Revolted Negroes of Surinam, in Guiana, on the Wild Coast of South America: from the year 1772, to 1777. Volume 1, second edition.* London: J. Johnson.

Stemp, W. J., 2014. A review of quantification of lithic use-wear using laser profilometry: a method based on metrology and fractal analysis. *Journal of Archaeological Science,* 48, 15-25.

Stemp, W. J., B. E. Childs, S. Vionnet & C. A. Brown, 2009. Quantification and discrimination of lithic use-wear: Surface profile measurements and length-scale fractal analysis. *Archaeometry,* 51(3), 366-382.

Stemp, W. J. & S. Chung, 2011. Discrimination of surface wear on obsidian tools using LSCM and RelA: pilot study results (area-scale analysis of obsidian tool surfaces). *Scanning,* 33(5), 279-293.

Stemp, W. J., H. J. Lerner & E. H. Kristant, 2013. Quantifying Microwear on Experimental Mistassini Quartzite Scrapers: Preliminary Results of Exploratory Research Using LSCM and Scale-Sensitive Fractal Analysis. *Scanning,* 35(1), 28-39.

Stemp, W. J. & M. Stemp, 2001. UBM Laser profilometry and lithic use-wear analysis: A variable length scale investigation of surface topography. *Journal of Archaeological Science,* 28(1), 81-88.

Stevens-Arroyo, A. M., 2006. *Cave of the Jagua: The mythological world of the Taínos. Second edition.* Chicago: University of Chicago Press.

Stevens, N. E., D. R. Harro & A. Hicklin, 2010. Practical quantitative lithic use-wear analysis using multiple classifiers. *Journal of Archaeological Science,* 37(10), 2671-2678.

Stolze Lima, T., 1996. O dois e seu múltiplo: Reflexões sobre o perspectivismo em uma cosmologia Tupi. *Mana,* 2(2), 21-47.

Stolze Lima, T., 2000. Towards an ethnographic theory of the nature/culture distinction in Juruna cosmology. *Brazilian Review of Social Science,* (Special Issue 1), 43-52.

Stordeur, D., 1987. Manches et emmanchements préhistoriques. Quelques propositions préliminaires, in *Le main et l'outil. Manches et emmanchements préhistoriques. Table Ronde C.N.R.S. tenue à Lyon du 26 au 29 novembre 1984,* ed. D. Stordeur. Lyon/Paris: Maison de l'Orient / Diffusion de Boccard, 11-34.

Stout, D., J. Quade, S. Semaw, M. J. Rogers & N. E. Levin, 2005. Raw material selectivity of the earliest stone toolmakers at Gona, Afar, Ethiopia. *Journal of Human Evolution,* 48(4), 365-380.

Strathern, M., 1969. Stone Axes and Flake Tools: Evaluations from Two New Guinea Highlands Societies. *Proceedings of the Prehistoric Society,* 35, 311-329.

Strathern, M., 1988. *The gender of the gift.* Berkeley: University of California Press.

Su-Jung, C., Z. Jing-Guo, H. Yun-Ao, L. Ying-San, C. Yang-Fang, S. Han-Yu, J. K. W. Lee, G. S. Burr, L. Way-Fan, T. Mao-Hua & L. Ching-Hua, 2014. Discovery of the Earliest Synthetic Carborundum (SiC) in Neolithic Jade Artifacts in Eastern China. *Terrestrial, Atmospheric & Oceanic Sciences,* 25(4), 537-544.

Su, X.-W., D.-M. Zhang & A. H. Heuer, 2004. Tissue Regeneration in the Shell of the Giant Queen Conch, *Strombus gigas*. *Chemistry of Materials,* 16(4), 581-593.

Sutty, L., 1977. A study of shells and shelled objects from six precolumbian sites in the Grenadines of St. Vincent and Grenada, in *Seventh International Congress for the Study of pre-Columbian Cultures of the Lesser Antilles*, eds. J. Benoist & F.-M. Mayer. Caracas: Centre de Recherches Caraïbes, 195-210.

Sutty, L., 1989. Paleoecological Formations in the Grenadines of Grenada and their relationship to Preceramic and Ceramic Settlements: Carriacou, in *13th International Congress for Caribbean Archaeology*, eds. E. N. Ayubi & J. Haviser. Willemstad, Curaçao, 127-147.

Swift, E., 2012. Object Biography, Re-use and Recycling in the Late to Post-Roman Transition Period and Beyond: Rings made from Romano-British Bracelets. *Britannia,* 43, 167-215.

Szabó, K. A., 2004. *Technique and Practice: Shellworking in the Western Pacific and island Southeast Asia.* Ph.D. dissertation. Canberra: Australian National University, Department of Archaeology and Natural History.

Szabó, K. A., 2008. Shell as a Raw Material: Mechanical Properties and Working Techniques in the Tropical Indo-West Pacific. *Archaeofauna,* 17, 125-138.

Szabó, K. A., 2010. Shell Artefacts and Shell-Working within the Lapita Cultural Complex. *Journal of Pacific Archaeology,* 1(2), 115-127.

Szabó, K. A., A. Brumm & P. Bellwood, 2007. Shell Artefact Production at 32,000-28,000 BP in Island Southeast Asia: Thinking across Media? *Current Anthropology,* 48(5), 701-723.

Taborin, Y., 1993. Traces de façonnage et d'usage sur les coquillages perforés, in *Traces et Fonction: Les gestes retrouvés. Actes du colloque international de Liège*, eds. P. C. Anderson, S. Beyries, M. Otte & H. Plisson. Liège: Édition ERAUL 50, 255-267.

Takadoum, J., 2008. *Materials and Surface Engineering in Tribology.* London & Hoboken: ISTE Ltd & John Wiley & Sons, Inc.

Taube, K. A., 2000. Lightning celts and corn fetishes: the formative Olmec and the development of Maize symbolism in Mesoamerica and the American southwest, in *Olmec Art and Archaeology: Social complexity in the formative period*, eds. J. E. Clark & M. Pye. Washington: National Gallery of Art, 296-337.

Taube, K. A., 2005. The symbolism of jade in Classic Maya religion. *Ancient Mesoamerica,* 16(1), 23-50.

Taylor, D., M. Biscione & P. G. Roe, 1997. Epilogue: The Beaded *Zemi* in the Pigorini Museum, in *Taíno: Pre-Columbian art and culture from the Caribbean*, eds. F. Bercht, E. Brodsky, J. A. Farmer & D. Taylor. New York: Monacelli Press, 158-169.

Taylor, J. D. & M. Layman, 1972. The mechanical properties of bivalve (mollusca) shell structures. *Palaeontology,* 15, 73-86.

Tenório, M. C., 2003. Os amoladores-polidores fixos. *Revista Arqueologia,* 16, 87-108.

Terradas, X., A. Vila, I. Clemente Conte & M. E. Mansur, 1999. Ethno-neglect or the contradiction between ethnohistorical sources and the archaeological record: The case of stone tools from the Yamana (Tierra del Fuego, Argentina), in *Ethno-analogy and the reconstruction of prehistoric artefact use and production*, eds. L. R. Owen & M. Porr. Tübingen: Mo Vince Verlag, 103-115.

Thirault, E., 2004. *Echanges Néolithiques : les haches alpines.* Montagnac: Editions Monique Mergoil.

Thirault, E., 2005. The politics of supply: the Neolithic axe industry in Alpine Europe. *Antiquity,* 79(303), 34-50.

Thomas, N., 1991. *Entangled objects. Exchange, material culture, and colonialism in the Pacific.* Cambridge: Harvard University Press.

Thompson, V. D., T. J. Pluckhahn, M. H. Colvin, J. Cramb, K. G. Napora, J. Lulewicz & B. T. Ritchison, 2017. Plummets, public ceremonies, and interaction networks during the Woodland period in Florida. *Journal of Anthropological Archaeology,* 48, 193-206.

Tian, L., X. Tian, G. Hu, Y. Wang & L. Ren, 2014. Effects and Mechanisms of Surface Topography on the Antiwear Properties of Molluscan Shells (Scapharca subcrenata) Using the Fluid-Solid Interaction Method. *The Scientific World Journal,* 2014, 12.

Tian, X., Z. Han, X. Li, Z. Pu & L. Ren, 2010. Biological coupling anti-wear properties of three typical molluscan shells—Scapharca subcrenata, Rapana venosa and Acanthochiton rubrolineatus. *Science China Technological Sciences,* 53(11), 2905-2913.

Ting, C., B. Neyt, J. Ulloa Hung, C. Hofman & P. Degryse, 2016. The production of pre-Colonial ceramics in northwestern Hispaniola: A technological study of Meillacoid and Chicoid ceramics from La Luperona and El Flaco, Dominican Republic. *Journal of Archaeological Science: Reports,* 6, 376-385.

Ting, C., J. Ulloa Hung, C. L. Hofman & P. Degryse, 2018. Indigenous technologies and the production of early colonial ceramics in Dominican Republic. *Journal of Archaeological Science: Reports,* 17, 47-57.

Tixier, J. (ed.) 1980. *Préhistoire et Technologie Lithique. Journées Du 11-13 Mai 1979,* Valbonne: Éditions du CNRS.

Tomasso, S. & V. Rots, 2017. What is the use of shaping a tang? Tool use and hafting of tanged tools in the Aterian of Northern Africa. *Archaeological and Anthropological Sciences*.

Tong, J., H. Wang, Y. Ma & L. Ren, 2005. Two-Body Abrasive Wear of the Outside Shell Surfaces of Mollusc Lamprotula fibrosa Heude, Rapana venosa Valenciennes and Dosinia anus Philippi. *Tribology Letters,* 19(4), 331-338.

Torró, L., A. Garcia-Casco, J. A. Proenza, I. F. Blanco-Quintero, G. Gutiérrez-Alonso & J. F. Lewis, 2016. High-pressure greenschist to blueschist facies transition in the Maimón Formation (Dominican Republic) suggests mid-Cretaceous subduction of the Early Cretaceous Caribbean arc. *Lithos,* 266, 309-331.

Torró, L., J. A. Proenza, C. Marchesi, A. Garcia-Casco & J. F. Lewis, 2017. Petrogenesis of meta-volcanic rocks from the Maimón Formation (Dominican Republic): Geochemical record of the nascent Greater Antilles paleo-arc. *Lithos,* 278, 255-273.

Toth, N. & M. Woods, 1989. Molluscan Shell Knives and Experimental Cut-Marks on Bones. *Journal of Field Archaeology,* 16(2), 250-255.

Tremain, C. G., 2014. Pre-Columbian"Jade": Towards an improved identification of green-colored stone in Mesoamerica. *Lithic Technology,* 39(3), 137-150.

Trigger, B. G., 2008. *A History of Archaeological Thought. Second edition.* New York: Cambridge University Press.

Tringham, R., G. Cooper, G. H. Odell, B. Voytek & A. Whitman, 1974. Experimentation in the formation of edge damage: A new approach to lithic analysis. *Journal of Field Archaeology,* 1, 171-196.

Tsoraki, C., 2011. Disentangling Neolithic networks: Ground stone technology, material engagements and networks of action, in *Tracing prehistoric social networks through technology: A diachronic perspective on the Aegean*, ed. A. Brysbaert. London: Routledge, 12-29.

Tsujimori, T. & G. E. Harlow, 2012. Petrogenetic relationships between jadeitite and associated high-pressure and low-temperature metamorphic rocks in worldwide jadeitite localities: a review. *European Journal of Mineralogy,* 24(2), 371-390.

Turner, T. S., 2009a. The crisis of late structuralism. Perspectivism and animism: Rethinking culture, nature, spirit, and bodiliness. *Tipití: Journal of the Society for the Anthropology of Lowland South America,* 7(1), 3-40.

Turner, T. S., 2009b. Valuables, value, and commodities among the Kayapo of Central Brazil, in *The Occult Life of Things: Native Amazonian theories of materiality and personhood*, ed. F. Santos-Granero. Tucson: The University of Arizona Press, 152-169.

Turney, M. H. J., 2001. *Classification and interpretation of Saladoid period shell artifacts from the Elliot's and Royall's archaeological sites.* MA thesis. Calgary: University of Calgary, Department of Archaeology.

Ulloa Hung, J., 2005. Approaches to Early Ceramics in the Caribbean: Between Diversity and Unilineality, in *Dialogues in Cuban Archaeology*, eds. L. A. Curet, S. L. Dawdy & G. La Rosa Corzo. Tuscaloosa: University of Alabama Press, 103-124.

Ulloa Hung, J., 2013a. *Arqueología en la Linea Noroeste de La Española. Paisaje, cerámicas e interacciones.* Ph.D. dissertation. Leiden: Leiden University, Faculty of Archaeology.

Ulloa Hung, J., 2013b. *Resumen trabajos de campo (Survey). Junio-Julio del 2013.* Santo Domingo: Museo del Hombre Dominicano.

Ulloa Hung, J., 2014. *Informe de trabajos de campo (junio-julio 2014) en el noroeste de la República Dominicana.* Santo Domingo: Museo del Hombre Dominicano.

Unger-Hamilton, R., 1984. The formation of use-wear polish on flint: beyond the "deposit versus abrasion" controversy. *Journal of Archaeological Science,* 11(1), 91-98.

Unger-Hamilton, R., R. Grace, R. Miller & C. A. Bergman, 1987. Drill bits from Abu Salabikh, Iraq, in *Le main et l'outil. Manches et emmanchements préhistoriques. Table Ronde C.N.R.S. tenue à Lyon du 26 au 29 novembre 1984*, ed. D. Stordeur. Lyon / Paris: Maison de l'Orient / Diffusion de Boccard, 269-285.

Unrath, G., L. R. Owen, A. L. Van Gijn, E. H. Moss, H. Plisson & P. Vaughan, 1986. An evaluation of micro-wear studies. A multi-analyst approach, in *Technical aspects of micro-wear studies on stone tools*, eds. L. R. Owen & G. Unrath. Tübingen, 117-176.

Val, A., S. Costamagno, E. Discamps, S. Chong, E. Claud, M. Deschamps, V. Mourre, M. C. Soulier & C. Thiébaut, 2017. Testing the influence of stone tool type on microscopic morphology of cut-marks: Experimental approach and application to the archaeological record with a case study from the Middle Palaeolithic site of Noisetier Cave (Fréchet-Aure, Hautes-Pyrénées, France). *Journal of Archaeological Science: Reports,* 11, 17-28.

Valcárcel Rojas, R., 2016. *Archaeology of early colonial interaction at El Chorro de Maíta, Cuba.* Gainesville: University Press of Florida.

Valcárcel Rojas, R., J. Cooper, J. Calvera Rosés, O. Brito Martínez & M. Labrada, 2006. Postes en el mar: Excavacíon de una estructura constructiva aborigen en Los Buchillones. *El Caribe Arqueológico,* 9, 76-88.

Valcárcel Rojas, R., A. V. M. Samson & M. L. P. Hoogland, 2013. Indo-Hispanic Dynamics: From Contact to Colonial Interaction in the Greater Antilles. *International Journal of Historical Archaeology,* 17(1), 18-39.

Van den Bel, M., 2015. Uma nota sobre a introdução de raladores de metal e sobre a produção e consumo da mandioca e do milho na zona costeira das Guianas durante o século XVII. *Amazônica Revista de Antropologia,* 7(1), 100-131.

Van den Bel, M. (ed.) 2018. *Guadeloupe, Capesterre-Belle-Eau, Parking de Roseau: Sainte-Marie avant l'arrivée de Christophe Colomb*. Bègles: Inrap GSO (Rapport de fouille).

Van den Dries, M. H. & A. L. Van Gijn, 1997. The representativity of experimental usewear traces, in *Siliceous rocks and culture*, eds. A. Ramos-Millán & M. A. Bustillo. Granada: Universidad de Granada, 499-513.

Van der Steen, E. J., 1992. Shell artefacts of Golden Rock, in *The archaeology of St. Eustatius: The Golden Rock site*, eds. A. H. Versteeg & K. Schinkel. Amsterdam & St. Eustatius: The Foundation for Scientific Research in the Caribbean Region & The St. Eustatius Historical Foundation, 93-118.

Van Gijn, A. L., 1990. *The wear and tear of flint. Principles of functional analysis applied to Dutch Neolithic assemblages.* Leiden: Faculty of Archaeology, Leiden University.

Van Gijn, A. L., 2005. A functional analysis of some Late Mesolithic bone and antler implements from the Dutch coastal zone, in *From hooves to horns, from mollusc to mammoth. Manufacture and use of bone artefacts from prehistoric times to the present. Proceedings of the 4th Meeting of the ICAZ Worked Bone Research Group at Tallinn, 26th-31st of August 2003*, eds. H. Luik, A. M. Choyke, C. E. Batey & L. Lougas. Tallinn, 47-66.

Van Gijn, A. L., 2007. Biografie van een artefact. Het belang van functionele analyse. *Archeobrief,* 11(1), 12-16.

Van Gijn, A. L., 2008a. Exotic flint and the negotiation of a new identity in the 'margins' of the agricultural world: the case of the Rhine-Meuse delta, in *Between Foraging and Farming*, eds. H. Fokkens, B. J. Coles, A. L. Van Gijn, J. P. Kleijne, H. H. Ponjee & C. G. Slappendel. Leiden: Faculty of Archaeology, 193-202.

Van Gijn, A. L., 2008b. Toolkits and technological choices at the Middle Neolithic site of Schipluiden, The Netherlands, in *Prehistoric Technology' 40 years later. Functional studies and the Russian legacy. Proceedings of the International Congress Verona (Italy), 20-23 April 2005*, eds. L. Longo & N. Skakun. Oxford: Archaeopress, 217-225.

Van Gijn, A. L., 2009. The use of exotic flint and the neolithisation of the Lower Rhine Basin (NL). *Internet Archaeology,* (26).

Van Gijn, A. L., 2010. *Flint in Focus: Lithic biographies in the Neolithic and Bronze Age.* Leiden: Sidestone Press.

Van Gijn, A. L., 2012. New perspectives for microwear analysis, in *The End of our Fifth Decade*, eds. C. C. Bakels & H. Kamermans. Leiden: Faculty of Archaeology, Leiden University, 275-282.

Van Gijn, A. L., 2014a. The ritualisation of agricultural tools during the Neolithic and the Early Bronze Age, in *Exploring and explaining diversity in agricultural technology*, eds. A. L. Van Gijn, A. P.C. & J. C. Whittaker. Oxford: Oxbow Books, 311-318.

Van Gijn, A. L., 2014b. Science and interpretation in microwear studies. *Journal of Archaeological Science,* 48, 166-169.

Van Gijn, A. L., 2017. Bead Biographies from Neolithic Burial Contexts: Contributions from the Microscope, in *Not just for Show: The archaeology of beads, beadwork, & personal ornaments*, eds. D. E. Bar-Yosef Mayer, C. Bonsall & A. M. Choyke. Oxford: Oxbow Books, 103-114.

Van Gijn, A. L. & C. L. Hofman, 2008. Were they used as tools? An exploratory functional study of abraded potsherds from two pre-colonial sites on the island of Guadeloupe, northern Lesser Antilles. *Caribbean Journal of Science,* 44(1), 21-35.

Van Gijn, A. L. & R. A. Houkes, 2006. Stone, procurement and use, in *Schipluiden. A neolithic Settlement on the Dutch North Sea coast C.3500 CAL BC*, eds. L. P. Louwe Kooijmans & P. F. B. Jongste. Leiden: Analecta Praehistorica leidensia, 167-193.

Van Gijn, A. L. & Y. M. J. Lammers-Keijsers, 2010. Toolkits for ceramic production: informal tools and the importance of high power use-wear analysis. *Bulletin de la société Préhistorique Française,* 107(4), 755-762.

Van Gijn, A. L., Y. M. J. Lammers-Keijsers & I. Briels, 2008. Tool use and technological choices. An integral approach toward functional analysis of Caribbean tool assemblages, in *Crossing the borders. New methods and techniques in the study of archaeological materials from the Caribbean*, eds. C. L. Hofman, M. Hoogland & A. L. Van Gijn. Tuscaloosa: Alabama University Press, 101-114.

Van Gijn, A. L. & N. Mazzucco, 2013. Domestic activities at the Linear Pottery site of Elsloo (Netherlands): a look from under the microscope, in *The Domestic Space in LBK Settlements*, eds. C. Hamon, P. Allard & M. Ilett. Rahden / Westfalen: Verlag Marie Leidorf GmbH, 111-126.

Van Gijn, A. L. & D. Pomstra, 2016. 'Huize Horsterwold': The reconstruction of a Neolithic houseplan using Stone Age equipment, in *The life cycle of structures in experimental archaeology: an object biography approach*, eds. L. Hurcombe & P. Cunningham. Leiden: Sidestone Press, 177-186.

Van Gijn, A. L. & D. C. M. Raemaekers, 1999. Tool use and society in the Dutch Neolithic. The inevitability of ethnographic analogies, in *Ethno-analogy and the reconstruction of prehistoric artefact use and production*, eds. L. R. Owen & M. Porr. Tübingen: Mo Vince Verlag, 43-52.

Van Gijn, A. L. & D. C. M. Raemaekers, 2014. Choosy about stone - The significance of the colour red in the Dutch funnel Beaker Culture, in *Flint from Heligoland - the exploitation of a unique source of raw material on the North Sea coast*, eds. F. Bittman, J. Ey, F. Bungenstock, H. Jöns, E. Strahl & S. Wolters. Rahden/ Westfalen: Verlag Marie Leidorf GmbH, 195-202.

Van Gijn, A. L. & K. Wentink, 2013. The role of flint in mediating identities: The microscopic evidence, in *Mobility, meaning & transformations of things, shifting contexts of material culture through time and space*, eds. H. P. Hahn & H. Weiss. Oxford: Oxbow books, 120-132.

Van Velthem, L. H., 2001. The woven universe: Carib basketry, in *Unknown Amazon: Culture in nature in ancient Brazil*, eds. C. McEwan, C. Barreto & E. G. Neves. London: British Museum Press, 198-213.

Van Velthem, L. H., 2003. *O belo é a fera: A estética da produção e da predação entre os Wayana.* Lisboa: Assírio and Alvim.

Vargas Arenas, I., M. I. Toledo, L. E. Molina & C. E. Montcourt, 1997. *Los Artífices de la Concha. Ensayo sobre tecnología, arte y otros aspectos Socioculturales de los Antiguos habitantes del Estado Lara.* Quibor: Museo Arqueológico de Quibor.

Vargiolu, R., E. Morero, A. Boleti, H. Procopiou, C. Pailler-Mattei & H. Zahouani, 2007. Effects of abrasion during stone vase drilling in Bronze Age Crete. *Wear,* 263(1–6), 48-56.

Vaughan, P. C., 1981. *Lithic microwear experimentation and the functional analysis of a Lower Magdalenian stone tool assemblage.* Ph.D. Ann Arbor: University of Pennsylvania, Anthropology.

Vaughan, P. C., 1985. *Use-wear analysis of flaked stone tools.* Tucson: The University of Arizona Press.

Vega, B., 1987. *Santos, Shamanes y Zemies.* Santo Domingo: Fundación Cultural Dominicana.

Velázquez Castro, A., 2012. The study of shell object manufacturing techniques from the perspective of experimental archaeology and work traces, in *Archaeology: New Approaches in Theory and Techniques*, ed. I. Ollich-Castanyer. Rijeka: InTech, 231-250.

Velázquez Castro, A., E. Melgar Tísoc & A. M. Hocquenghem, 2006. Análisis de las huellas de manufactura del material malacológico de Tumbes, Perú. *Bulletin de l'Institut Français d'Études Andines,* 35(1), 21-35.

Velázquez Castro, A. & E. R. Melgar Tísoc, 2014. Producciones palaciegas tenochcas en objetos de concha y lapidaria. *Ancient Mesoamerica,* 25(1), 295-308.

Veloz Maggiolo, M., 1972. *Arqueología Prehistórica de Santo Domingo.* Singapore: McGraw-Hill Far Eastern Publishers.

Veloz Maggiolo, M., 1976. *Medioambiente y adaptacion humana en la prehistoria de Santo Domingo. Tomo 1.* Santo Domingo: Ediciones de Taller.

Veloz Maggiolo, M., 1991. *Panorama Histórico del Caribe Precolombino.* Santo Domingo: Edición del Banco Central de la Republica Dominicana.

Veloz Maggiolo, M. & E. J. Ortega, 1980. Nuevos hallazgos arqueologicos en la costa norte de Santo Domingo. *Boletín del Museo del Hombre Dominicano,* 13, 11-60.

Veloz Maggiolo, M., E. J. Ortega & A. Caba Fuentes, 1981. *Los modos de vida Meillacoides y sus possibles origines.* Santo Domingo: Museo del Hombre Dominicano.

Venditti, F., J. Tirillò & E. A. A. Garcea, 2016. Identification and evaluation of post-depositional mechanical traces on quartz assemblages: An experimental investigation. *Quaternary International,* 424, 143-153.

Venkatesan, S., M. Carrithers, M. Candea, K. Sykes & M. Holbraad, 2010. Ontology Is Just Another Word for Culture: Motion Tabled at the 2008 Meeting of the Group for Debates in Anthropological Theory, University of Manchester. *Critique of Anthropology,* 30(2), 152-200.

Venter, M. L., N. H. Lopinot, J. R. Ferguson & M. D. Glascock, 2017. Ceramic Production and Interaction in the Northern Range of Trinidad. *The Journal of Island and Coastal Archaeology,* 12(4), 585-605.

Verbaas, A. & A. L. Van Gijn, 2008. Querns and other hard stone tools from Geleen-Janskamperveld, in *Excavations at Geleen-janskamperveld 1990/1991*, ed. P. Van de Velde. Leiden: Analecta Praehistorica Leidensia, 191-204.

Vermeij, G. J., 1993. *A natural history of shells.* Princeton: Princeton University Press.

Versteeg, A. H., 2003. *Suriname voor Columbus/Suriname before Columbus.* Paramaribo: Stichting Surinaams Museum.

Versteeg, A. H. & S. Rostain, 1999. A hafted Amerindian stone axe recovered from the Suriname River. *Mededelingen Surinaams Museum,* 55, (in press).

Vianello, A. (ed.) 2011. *Exotica in the Prehistoric Mediterranean,* Oxbow Books: Oxford.

Vidale, M., 1995. Early beadmakers of the Indus tradition. The manufacturing sequence of talc beads at Mehrgarh in the 5th Millennium BC. *East and West,* 45, 45-80.

Vieira de Oliveira, N., 2013. Oficina Lítica de polimento no Noroeste do estado do Rio de Janeiro/Lithic polishing workshop in Northwest of Rio de Janeiro. *Revista de Arqueologia Pública,* 8, 78-86.

Vila, A. & F. Gallart, 1993. Caracterización de los micropulidos de uso: ejemplo de aplicación del análisis de imágenes digitalizadas, in *Traces et Fonction: Les gestes retrouvés. Actes du colloque international de Liège*, eds. P. C. Anderson, S. Beyries, M. Otte & H. Plisson. Liège: Édition ERAUL 50, 459-466.

Vilaça, A., 1992. *Comendo Como Gente: Formas do canibalismo Wari'.* Rio de Janeiro: Editora da UFRJ/Anpocs.

Viveiros de Castro, E. B., 1992. *From the enemy's point of view: humanity and divinity in an Amazonian society.* Chicago: University of Chicago Press.

Viveiros de Castro, E. B., 1998. Cosmological Deixis and Amerindian Perspectivism. *The Journal of the Royal Anthropological Institute,* 4(3), 469-488.

Viveiros de Castro, E. B., 2004a. Exchanging perspectives: The transformation of objects into subjects in Amerindian ontologies. *Common Knowledge,* 10(3), 463-484.

Viveiros de Castro, E. B., 2004b. Perspectival anthropology and the method of controlled equivocation. *Tipití:*

Journal of the Society for the Anthropology of Lowland South America, 2, 3-22.

Viveiros de Castro, E. B., 2007. The crystal forest: Notes on the ontology of Amazonian spirits. *Inner Asia,* 9, 153-172.

von den Steinen, K., 1897. *Unter den Naturvölkern Zentral-Brasiliens.* Berlin: Geografische Verlagsbuchhandlun Dietrich Reimer.

von Hornbostel, E. M. & C. Sachs, 1961. Classification of Musical Instruments: Translated from the Original German by Anthony Baines and Klaus P. Wachsmann. *The Galpin Society Journal,* 14, 3-29.

Vredenbregt, A. H. L., 2004. From myth to matter: The ceramic tradition of the Kari'na of northeast Suriname. *Leiden Journal of Pottery Studies,* 20, 75-76.

Wadge, G., 1994. Tobago, in *Caribbean Geology: An introduction*, eds. S. K. Donovan & T. A. Jackson. Kingston: UWIPA, 167-177.

Wagner, E. & C. Schubert, 1972. Pre-Hispanic workshop of serpentinite artifacts, Venezuelan Andes, and possible raw material source. *Science,* 174(4024).

Walker, H., 2009. Baby hammocks and stone bowls: Urarina technologies of companionship and subjection, in *The Occult Life of Things: Native Amazonian theories of materiality and personhood*, ed. F. Santos-Granero. Tucson: The University of Arizona Press, 81-102.

Walker, J. B., 1979. Analysis and replication of lithic artifacts from the Sugar Factory Pier site, St. Kitts, in *Eighth International Congress for the Study of Pre-Columbian Cultures in the Lesser Antilles*, ed. S. Lewenstein. St. Kitts: Arizona State University.

Walker, J. B., 1980. *Analysis and Replication of the Lithic Artifacts from the Sugar Factory Pier Site, St. Kitts, West Indies.* Master Thesis. Washington: Washington State University, Department of Anthropology.

Walker, J. B., 1981. Use-wear analysis of Caribbean flaked stone tools, in *The Ninth International Congress for the study of the pre-Columbian Cultures of the Lesser Antilles*, eds. L. Allaire & F.-M. Mayer. Santo Domingo: Centre de Recherches Caraïbes, Université de Montréal, 239-247.

Walker, J. B., 1983. A preliminary report on the lithic and osteological remains from the 1980, 1981 and 1982 field seasons at Hacienda Grance (12 PSJ7-5), in *10th International Congress for the study of the pre-Columbian Cultures of the Lesser Antilles*, eds. L. Allaire & F.-M. Mayer. Fort-de-France, Martinique: Centre de Recherches Caraïbes, Université de Montréal, 181-224.

Walker, J. B., 1993. *Stone collars, elbow stones and three-pointers and the nature of Taíno ritual and myths.* Ph.D. Dissertation. Pullman: Washington State University, Department of Anthropology.

Walker, J. B., 2005. The Paso del Indio Site, Vega Baja, Puerto Rico: A Progress Report, in *Ancient Borinquen: Archaeology and ethnohistory of native Puerto Rico*, ed. P. E. Siegel. Tuscaloosa: University of Alabama Press, 55-87.

Walker, J. B. & R. Wilk, 1988. The manufacture and use-wear of ethnographic, replicated, and archaeological manioc grater board teeth, in *La Obsidiana en Mesoamérica*, eds. M. Gaxiola & J. E. Clark. Mexico, D.F.: Instituto Nacional de Antropología e Historia.

Warren, P., 1969. *Minoan Stone Vases.* Cambridge: Cambridge University Press.

Watson, J. P., 1980. The theory and practice of ethnoarchaeology with special reference to the Near East. *Paléorient,* 6, 55-64.

Watson, J. P., 1982. Review of *Living Archaeology*, by R.A. Gould. *American Antiquity,* 47, 445-448.

Watters, D. R., 1997. Maritime trade in the prehistoric eastern Caribbean, in *The indigenous people of the Caribbean*, ed. S. M. Wilson. Gainesville: University Press of Florida, 88-99.

Watters, D. R. & R. Scaglion, 1994. Beads and Pendants from Trants, Montserrat: Implications for the

Prehistoric Lapidary Industry of the Caribbean. *Annals of Carnegie Museum,* 63(3), 215-237.

Watts, D., 1987. *The West Indies: Patterns of Development, Culture and Environmental Change since 1492.* Cambridge: Cambridge University Press.

Weiner, A., 1992. *Inalienable possessions. The paradox of keeping-while-giving.* Berkeley: University of California Press.

Wen, S. & P. Huang, 2012. *Principles of Tribology.* Singapore: John Wiley & Sons (Asia) Pte Ltd & Tsinghua University Press.

Wenger, E., R. McDermott & W. M. Snyder, 2002. *Cultivating communities of practice: A guide to managing knowledge.* Boston: Harvard Business School Press.

Wentink, K., 2006. *Ceci n'est pas une hache: Neolithic depositions in the Northern Netherlands.* MPhil thesis. Leiden: Leiden University, Faculty of Archaeology.

West, J. A. & J. Louys, 2007. Differentiating bamboo from stone tool cut marks in the zooarchaeological record, with a discussion on the use of bamboo knives. *Journal of Archaeological Science,* 34(4), 512-518.

Weston, E., K. Szabó & N. Stern, 2017. Pleistocene shell tools from Lake Mungo lunette, Australia: Identification and interpretation drawing on experimental archaeology. *Quaternary International,* 427 A, 229-242.

Whitehead, N. L., 2002. Arawak Linguistic and Cultural Identity through Time: Contact, Colonialism, and Creolization, in *Comparative Arawakan Histories: Rethinking Language Family and Culture Area in Amazonia*, eds. J. D. Hill & F. Santos-Granero. Urbana and Chicago: University of Illinois Press.

Whitehead, N. L., 2011. *Of Cannibals and Kings: Primal anthropology in the Americas.* University Park: Pennsylvania State University Press.

Wiederhold, J. E. & C. D. Pevny, 2014. Fundamentals in practice: a holistic approach to microwear analysis at the Debra L. Friedkin site, Texas. *Journal of Archaeological Science,* 48, 104-119.

Wiemann, M. C. & D. W. Green, 2007. *Estimating Janka Hardness from Specific Gravity for Tropical and Temperate Species.* FPL-RP-643. United States Department of Agriculture, Forest Service, Forest Products Laboratory.

Wijnen, J., A. Verbaas & A. L. Van Gijn, 2018. Mimicking the Neolithic: long-term experiments with polished stone axes and adzes, in *Beyond use-wear traces: Tools and people*, eds. S. Beyries, C. Hamon & Y. Maigrot University of Nice Côte d'Azur.

Wilson, S. M., 1990. *Hispaniola: Caribbean Chiefdoms in the age of Columbus.* Tuscaloosa and London: University of Alabama Press.

Wilson, S. M., 1993. The Cultural Mosaic of the Indigenous Caribbean. *Proceedings of the British Academy,* 81, 37-66.

Wilson, S. M., 2007. *The Archaeology of the Caribbean.* Cambridge: Cambridge University Press.

Wilson, S. M., H. B. Iceland & T. R. Hester, 1998. Preceramic Connections Between Yucatan and the Caribbean. *Latin American Antiquity,* 9(4), 342-352.

Winter, J. & E. S. Wing, 1993. A refuse midden at the Minnis Ward site, San Salvador, Bahamas, in *15th International Congress for Caribbean Archaeology*, eds. R. E. Alegría & M. Rodríguez Lopez. San Juan: Centro de Estudios Avanzados de Puerto Rico y el Caribe, 423-433.

Winter, O. D., 2001. *An Introduction to Igneous and Metamorphic Petrology.* New Jersey: Prentice Hall.

Wiselius, S. I., 2005. *Houtvademecum, 9de druk.* Almere: Stichting Centrum Hout.

Witthoft, J., 1967. Glazed Polish on Flint Tools. *American Antiquity,* 32(3), 383-388.

Wobst, H. M., 1978. The archaeo-ethnology of hunter-gatherers, or the tyranny of the ethnographic record in archaeology. *American Antiquity,* 43, 303-309.

Woodcock, D. & A. Shier, 2002. Wood specific gravity and its radial variations: the many ways to make a tree. *Trees,* 16(6), 437-443.

Woods, C. A. & F. E. Sergile (eds.), 2001. *Biogeography of the West Indies: Patterns and perspectives,* Boca Raton: CRC Press.

Woodward, A., J. Hunter, R. Ixer, M. Maltby, P. J. Potts, P. C. Webb, J. S. Watson & M. C. Jones, 2005. Ritual in Some Early Bronze Age Gravegoods. *Archaeological Journal,* 162(1), 31-64.

Woodward, A., J. Hunter, D. with Bukach, S. P. Needham & A. Sheridan (eds.), 2015. *Ritual in Early Bronze Age Grave Goods: An examination of ritual and dress equipment from Chalcolithic and Early Bronze Age graves in England,* Oxford: Oxbow Books.

Wright, D., L. Nejman, F. d'Errico, M. Králík, R. Wood, M. Ivanov & Š. Hladilová, 2014. An Early Upper Palaeolithic decorated bone tubular rod from Pod Hradem Cave, Czech Republic. *Antiquity,* 88(339), 30-46.

Wylie, A., 1982. An analogy by any other name is just as analogical: A commentary on the Gould and Watson dialogue. *Journal of Anthropological Archaeology,* 1, 382-401.

Wylie, A., 1985. The reaction against analogy, in *Advances in Archaeological Method and Theory 8*, ed. M. B. Schiffer. Orlando: Academic Press, 63-108.

Wylie, A., 1988. 'Simple' analogy and the role of relevance assumptions: Implications of archaeological practice. *International Studies in the Philosophy of Science,* 2(2), 34-150.

Yamada, S., 1993. The formation processes of "use-wear polishes", in *Traces et Fonction: Les gestes retrouvés. Actes du colloque international de Liège*, eds. P. C. Anderson, S. Beyries, M. Otte & H. Plisson. Liège: Édition ERAUL 50, 433-445.

Yamada, S. & A. Sawada, 1993. The method of description for polished surfaces, in *Traces et Fonction: Les gestes retrouvés. Actes du colloque international de Liège*, eds. P. C. Anderson, S. Beyries, M. Otte & H. Plisson. Liège: Édition ERAUL 50, 447-457.

Yde, J., 1965. *Material Culture of the Waiwái.* Copenhagen: National Museum of Copenhagen.

Yerkes, R. W. & R. Barkai, 2004. Microwear analysis of Chalcolithic bifacial tools, in *Giv'at Ha-Oranim, A Chalcolithic Site*, eds. N. Scheftelowitz & R. Oren. Tel Aviv: Sonia and Marco Nadler Institute of Archaeology, Tel Aviv University, 110-124.

Yerkes, R. W. & R. Barkai, 2013. Tree-Felling, Woodworking, and Changing Perceptions of the Landscape during the Neolithic and Chalcolithic Periods in the Southern Levant. *Current Anthropology,* 54(2), 222-231.

Yerkes, R. W., R. Barkai, A. Gopher & O. Bar Yosef, 2003. Microwear analysis of early Neolithic (PPNA) axes and bifacial tools from Netiv Hagdud in the Jordan Valley, Israel. *Journal of Archaeological Science,* 30(8), 1051-1066.

Yerkes, R. W., E. Galili & R. Barkai, 2014. Activities at final Pre-Pottery Neolithic (PPNC) fishing village revealed through microwear analysis of bifacial flint tools from the submerged Atlit-Yam site, Israel. *Journal of Archaeological Science,* 48, 120-128.

Yerkes, R. W., H. Khalaily & R. Barkai, 2012. Form and function of early Neolithic bifacial stone tools reflects changes in land use practices during the Neolithization process in the Levant. *PLoS ONE,* 7(8), e42442.

Yerkes, R. W. & B. H. Koldehoff, 2018. New tools, new human niches: The significance of the Dalton adze and the origin of heavy-duty woodworking in the Middle Mississippi Valley of North America. *Journal of Anthropological Archaeology,* 50, 69-84.

Zanne, A. E., G. Lopez-Gonzalez, D. A. Coomes, J. Ilic, S. Jansen, S. L. Lewis, R. B. Miller, N. G. Swenson,

M. C. Wiemann & J. Chave, 2009. Global wood density database. *Dryad*. Identifier: http://hdl.handle.net/10255/dryad.235.

Zuschin, M., M. Stachowitsch & R. J. Stanton Jr, 2003. Patterns and processes of shell fragmentation in modern and ancient marine environments. *Earth-Science Reviews,* 63(1–2), 33-82.

Appendix 1

Experimental grinding of stone surfaces

This appendix contains the technical information from Chapter 5 for the experiments in the abrasive manufacturing of hard stone surfaces. It consists of the textual description and depiction of the progression and outcomes of each experiment. The order they appear in is derived from Table 1 (Section 5.1.2), with experiments of comparable parameters grouped together. Table A1 lists all experiments conducted (collaboratively) in the context of this study, keyed to the reference collection of the Leiden Laboratory for Artefact Studies.

A1.1 Experimental results from grinding lithic material

Exp. 2494 – volcanic sediment on quartz arenite (2497) – 90 minutes, added water

In this experiment the surface underwent rapid abrasion against the platform, with the consistent loss of material preventing any build-up of microwear. The macroscopic surface became heavily striated (closed/connected distribution), whereas microscopically, very few rudimentary polish spots (dull and rough texture) appeared on select harder grains. Otherwise, the micro-topography retained a ploughed appearance. The disparity in hardness and cohesion between the interacting rocks is clearly too high to allow the formation of a smoother surface, resistant enough to develop polish structures on its asperities. Accordingly, it shows how the selection of grinding and polishing platforms is not simply a matter of obtaining the hardest and toughest rocks available. Rather, it stands in relation to the type of rock that is being worked, and to possession of the necessary knowledge for and informed selection of the tool material. A final observation is that the intended curve of the sides proved attainable with the motion of grinding, resulting in a shape more closely approximating archaeological types.

Exps 2510, 2512, 3797 – greenschist-facies overprinted volcanic, basaltic, and jadeitite blanks on quartz arenite (2497) – 30, 60, 90 minutes, no additives*

The dry grinding of greenschist, basaltic, and jadeitite blanks quickly produced a highly levelled surface composed of flat plateaus harbouring comparatively minor interstices (Figure A1). By this is meant a heavily minimised roughness and strong reduction of interstitial space shared over all topographical highs, which essentially become flat plateaus. Continued work steadily expanded the levelled surface to the lower valleys, but failed to produce a higher intensity of traces. Indeed, the macroscopic appearance of the greenschist and basaltic blanks remains dull to lacking lustre, while their microtopography bears a faint scintillation deriving from the tops of crushed asperities (Table 2, *Dull fatigue*). Only in some spots do somewhat larger patches develop, but these remain dull, rough, and isolated. Conversely, the jadeitite microtopography developed denser, brighter scintillation (Table 2, *Bright fatigue*). In certain areas it looks more like a dull, rough textured coat of polish,

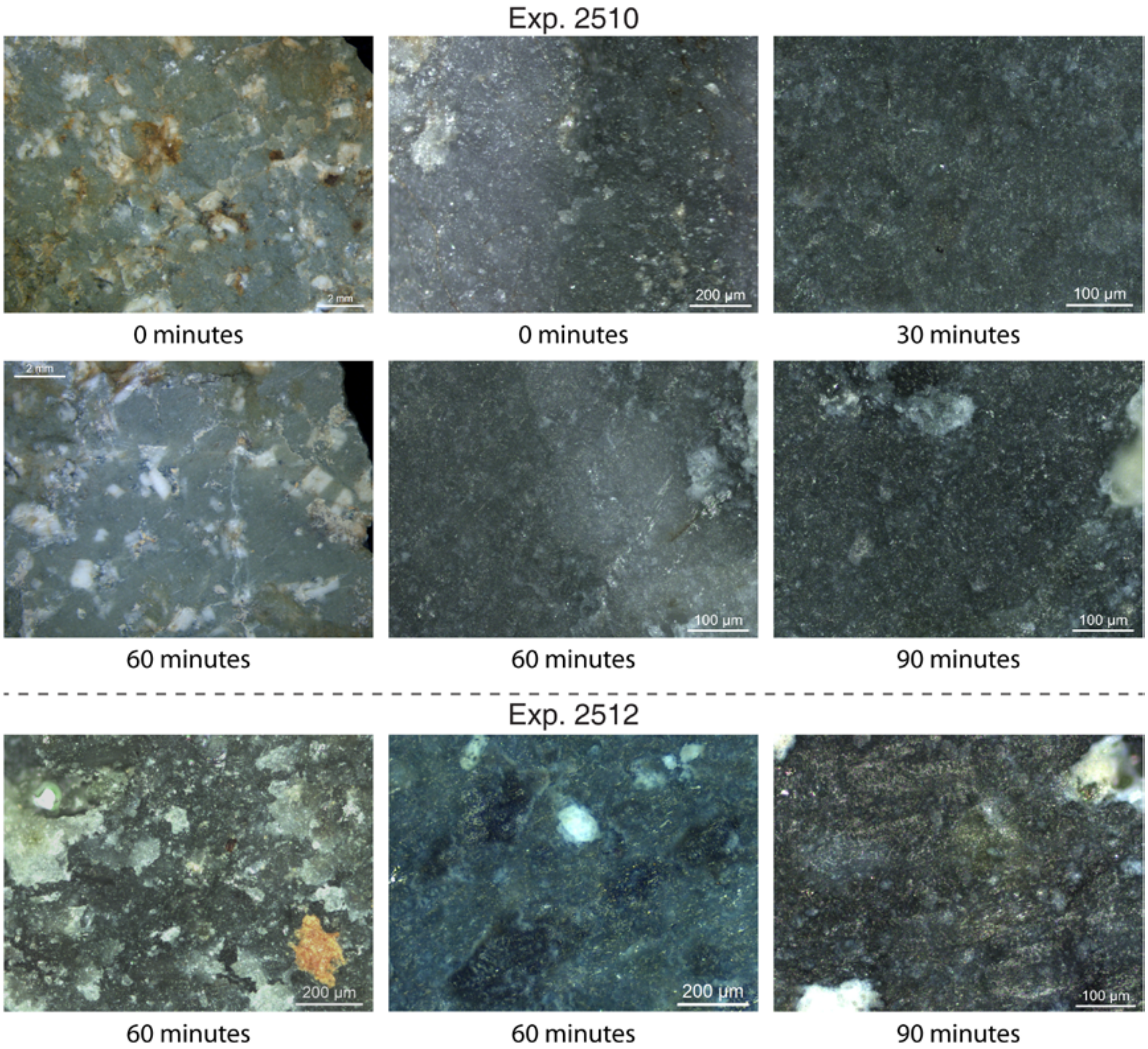

Figure A1: Sequence of surfaces from greenschist-facies overprinted 2510 and basaltic 2512 ground against quartz arenite 2497 without lubrication.

but that may be due to the interference discussed below. It can still be distinguished from the 'sand-ground'-type of polish-scintillation (see exp. 2550) by its complete spatial coverage and the absence of micro-topographic relief. Both factors indicate this wear signature still results from the evenly spread alteration of mineral texture under fatigue stress.

The basaltic blank registered a clear directionality after 60 and 90 minutes of work. Under high magnification, stone scratches (bright ploughing marks with internal striations embedded in the surface, sometimes interrupted) containing incipient rough dull polish were occasionally observed (Figure A1). The greenschist-facies altered rock was only lightly affected by this type of trace and then predominantly in the relict feldspar (Table 2,"*Stone scratches*'). Its matrix remained smooth and virtually clear of other wear trace features. Some directional organisation appeared early on in the jadeitite blank, which developed into linear bands of polish at the 60 minute mark that run parallel with the executed grinding motion (the blank was not abraded until the 90 minute mark). They are observable as bright streaks using a stereomicroscope and are located in association with the perforation of the ring, suggesting they may in fact relate to jadeite particles breaking off from its rim. These polish structures are of (semi-)smooth texture on single asperities that link up as bright but rougher plateaus within the band, with some invasiveness unto the upper slopes (Table 2, *Upper* *slopes*).

Abrasive wear appears to have been the dominant wear process during these experiments, producing a fine powder which thereafter acted as intermediate particles in the process, accompanied by a poignant smell. Fatigue wear likely played a secondary role by initially crushing the rougher asperities and continuing to exert pressure on the broken crystals, perhaps inducing minor particle ejection as well. The plateaus of the less well cemented basaltic rock are slightly less evenly levelled than on the other blanks, but nevertheless, polish developments from contact with the quartz arenite grinding platform are absent on all. Altogether, this grinding mode outpaced the other set-ups and attained one of the higher degrees of levelling, but failed to impart a significant gloss on the surface.

Exps 2511, 2513 – greenschist-facies overprinted volcanic and basaltic blanks on quartz arenite (2497) – 30, 60, 90 minutes, water additive

The levelling of the surfaces proceeded well in both experiments, though slowing down when larger surface areas became affected. Due to the continuously added water mixing with the stone powder produced by abrasion, a vestigial shimmer developed within minutes. Already at the 30 minute interval did this correspond to typical microwear polish from stone contact, i.e. flat, dull, and rough polish that is limited to the asperities, with a closed/covered distribution and density (Table 2, *Dull*; Figure A2). The greenschist matrix accrued fine striations at low magnification (closed/loose), but these were not observable under higher magnifications and remained stable throughout the duration of work. Conversely, striations on the basaltic groundmass became more prevalent and denser as work proceeded, than was the case with greenschist, also affecting the polish.

Upon 60 minutes of work the polish had intensified on both surfaces (Figure A2). Though they remain rough and do not significantly expand in size, the spots become brighter and denser to the point of a connected distribution over the matrix. Polish on the basalt appears directional in some areas, but this variable is not systematically patterned due to differences in the microtopographic relief. The tactility of these surfaces becomes smoother than those of the previous, dry-ground experiments, while a sub-metallic lustre captures and reflects natural light on both ground rocks.

Upon 90 minutes of work the traces seen on the greenschist matrix intensify slightly, likely indicating that an equilibrium in wear development was reached somewhere at this point where material loss and polish formation even out. In this case the breaking up of very bright polish (Table 2) with a loss of material provides an upper limit to smoothness and size of developed polish structures. The particle ejection, likely involving some fatigue stress, and stereoscopic striating both ensure the continuous presence of unaffected interstitial space in the on-going surface reduction. Furthermore, while the polish develops strongly on the matrix, most softer plagioclases develop only minor directional distribution that corresponds to the striated pattern seen only at low magnification. This situation displays very well how the inclusions respond differently to wear, with little polish formation but retention of directionality otherwise not perceivable on the chlorite matrix. The basaltic groundmass is affected differently. Here, the wear trace intensity actually reduced in size, brightness, and density from the previous observation at 60 minutes. Apparently, a momentary stage was reached in which surface material was torn away faster than crushed peaks could be smoothened out into polish. The texture, distribution, and surface coverage remain similar, and Figure A2 shows maximum contrast between the two phases that was less extreme in other surface areas. Since this regression was not seen in other experiments, the most parsimonial explanation is that dissipation of the lubricant

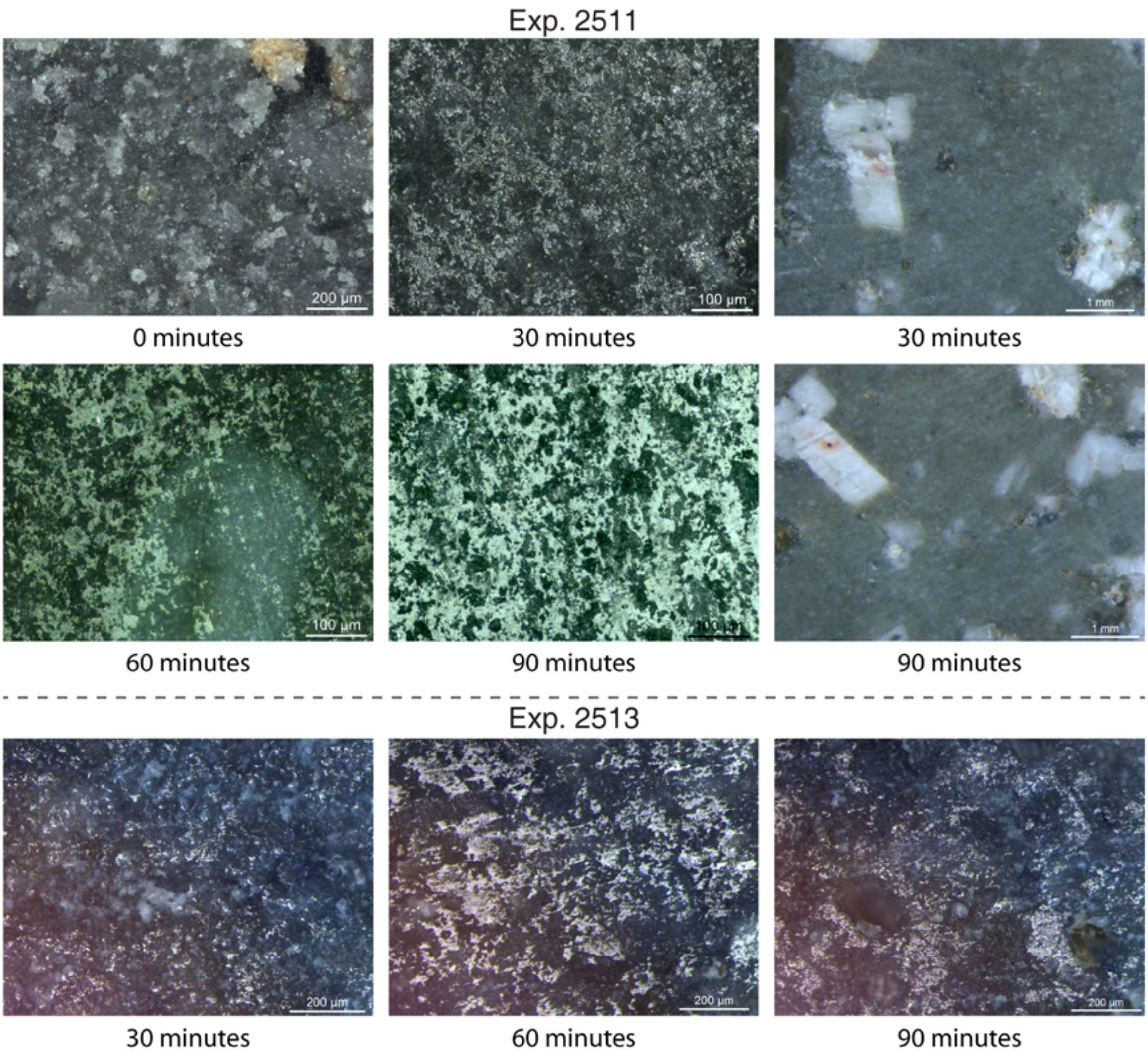

Figure A2: Sequence of surfaces from greenschist-facies overprinted 2511 and basaltic 2513 ground against quartz arenite 2497 with lubrication.

or an unintended change in gesture kinematics (perhaps muscle strain) upset the gradual progression towards a polished surface, and altered what wear processes were at play.

Abrasion remains the dominant wear mode in these experiments, given the reduction of rough surfaces to level plateaus and the continued presence of ploughing striations. Yet the addition of lubricating moisture, which forms a film that spreads the load of force, inhibits unfettered abrasion in favour of excessive polish formation. Such outcomes are in line with methodological expectations. One possible scenario is that the spreading of load by the film of water enables a slight plastic deformation of the molecular structure to occur, but tribometric investigation is needed to understand exactly what happens in the formation of polish on these types of rocks. Some fatigue and/or adhesive processes may act towards maintaining the equilibrium in wear development as well.

Exp. 2550 – greenschist-facies rock blank on fine-grained low cohesion sandstone (exp. SWH) – several hours (unspecified), water additive

This experiment was conducted by D. Pomstra to produce the greenstone axe head that was utilised during the wood chopping experiments (Section 5.2). Initially reduced using modern power tools, the preform was ground for several hours on a fine-grained sandstone of low cohesion (exp. SWH) with water. The tendency of this sandstone to shed grains indicates it will form a natural slurry when used in conjunction with water, but the exact degree to which this occurs was not reported. Due to logistics the analysis of the manufacturing traces took place only upon conclusion of the functional experiments on both initial casts and the actual surface (Section 5.2).

The abrasion experiment on sandstone exp. SWH produced a fairly well levelled surface, with some striations still visible and a dull to diffuse lustre. The microtopography has a low relief in general, characterised by a (very) rough, dull scintillating texture that brightens to a mild sheen on the upper areas (Figure A3). At first glance this sheen appears to be invasive to a degree atypical of contact with stone. This is more strongly expressed in high-lying areas where the vertical distance is greater, and generally varies somewhat over the surface. Peaks display broadly rounded appearances, there is no angularity to be observed. Actual polish is rare, the few discernable spots are small, bright, rough, and isolated on the peaks, or appear as smears between micro-asperities from the general rough texture. Striations are absent from the polish, but occasional larger stone ploughed striations are observed. Microtopography aside, since this experiment was actualistic it provides a window into the distribution of grinding striations on the stereoscopic view. These are obliterated on the faces but retained towards the periphery of the various surface planes, especially near and on the sides and the edge (Figure A3). Their distribution on the artefact is closed-concentrated (Figure 6), and in this case the striations are also present on the bevel. Typically, they are found in a perpendicular to semi-perpendicular orientation indicating the use of longitudinal grinding motions. It is well possible that striations originally present on the face were removed during the equilibrium of wear development on a flat surface, whereas this state was not attained near the sides and borders, where the motion is less efficient.

The process of wear is markedly different from the previously described experiments. Abrasion does play a role, indicated by ploughing grains, but these traces are limited to those areas where the contact with the platform is more limited. Given that striations were completely erased on the faces, these main

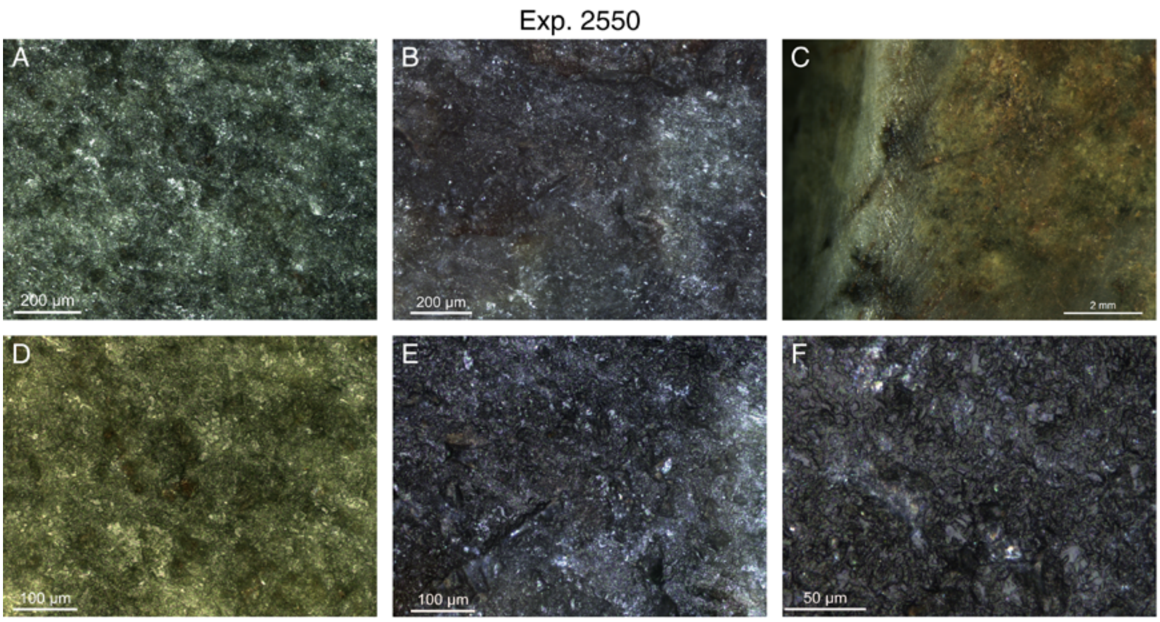

Figure A3: Various surfaces from greenschist-facies rock 2550 abraded for several hours against a fine-grained sandstone of low cohesion (exp. SWH) with water. A and D share locations, as do B, E, and F.

contact areas were evidently subjected to more complex interactions of wear. Fatigue and adhesion are implied by the invasive distribution of a rough textured modification of the microtopography, best explained as crystal grains becoming crushed due to mechanical stress load that is spread into lower areas by the water film. The crucial parameter is the loose cohesiveness, which appears to have permitted grains shed from the platform to become freely moving intermediate particles that were rounding asperities through impact and equally able to affect the topographic slopes. This would also explain the inhibition of polish development in spite of lubrication. Indeed, this interaction produced a wear pattern that is distinctive wholly for its overall effect on the microtopography, not reliant on microwear polish for evidencing contact with stone-like materials. Abrasion apparently plays a more limited role as well, possibly because the surface is continuously weakened by fatigue.

Exps 3036, 3037 – diorite pebbles on coarse-grained sandstone (3048) and Acropora palmata *(2476) – 60 minutes, water and quartz sand additives*

The experiments with diorite pebbles were conducted on different platforms. Since both had proven to be inefficient grinding surfaces in previous experiments, loose quartz sand was added as abrasive. Thereupon the sandstone platform ground efficiently whereas the softer coral performed more poorly, but the wear trace patterns on the blanks resemble each other. The light-coloured constituent minerals are well levelled bearing little polish, whereas the apparently more susceptible dark minerals were abraded more strongly and now appear sunken. The microtopography is rough but rounded, fairly bright, and scintillating, equivalent to the pattern described for experiment 2550 above (Figure A4). This is better visible on the dark minerals than on the higher lying light ones, on which the texture also appears slightly less rough. Stereoscopic striations are absent on either diorite, but incipient stone scratches appear on the blank ground on the coarse-grained sandstone. The surfaces lack lustre from abrasion, though some of their constituent minerals reflect light.

Exp. 2782 – greenschist-facies overprinted volcanic rock blank on fine-grained sandstone (3047) – 30, 60, 90 minutes, water additive

The reddish, fine-grained sandstone platform of this experiment proved capable of abrading the greenschist matrix blank, though it did not reach the efficiency of the quartz arenite. The surface of the blank became well levelled with a faint striated directionality at the stereoscopic scale, which remains unchanged across the observation intervals. Microscopically it corresponds to scattered patches of small, but relatively flat and bright polish with a rougher texture and clear directionality (Figure A5). The density and linkage of the polish increases after 60 and 90 minutes of grinding, evidencing how more topographic highs are reached and abraded in the process. Compared to the traces from

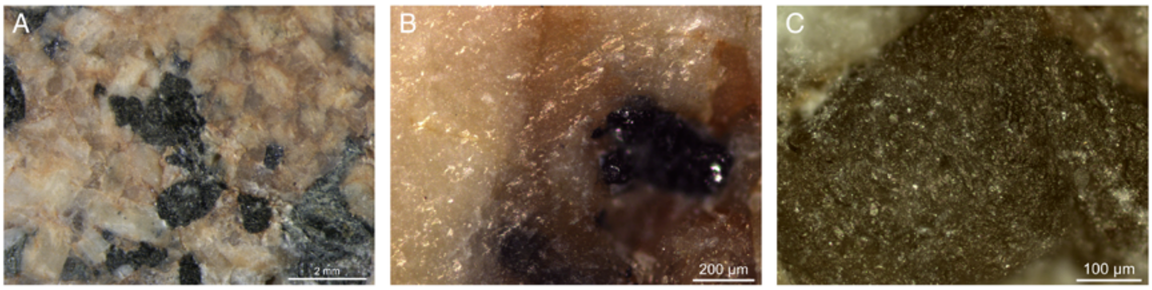

Figure A4: Various diorite surfaces (A-B, 3036; C, 3037) abraded for 60 minutes using a quartz sand slurry on a coarse-grained sandstone (3038) and *Acropora palmata* coral (2476).

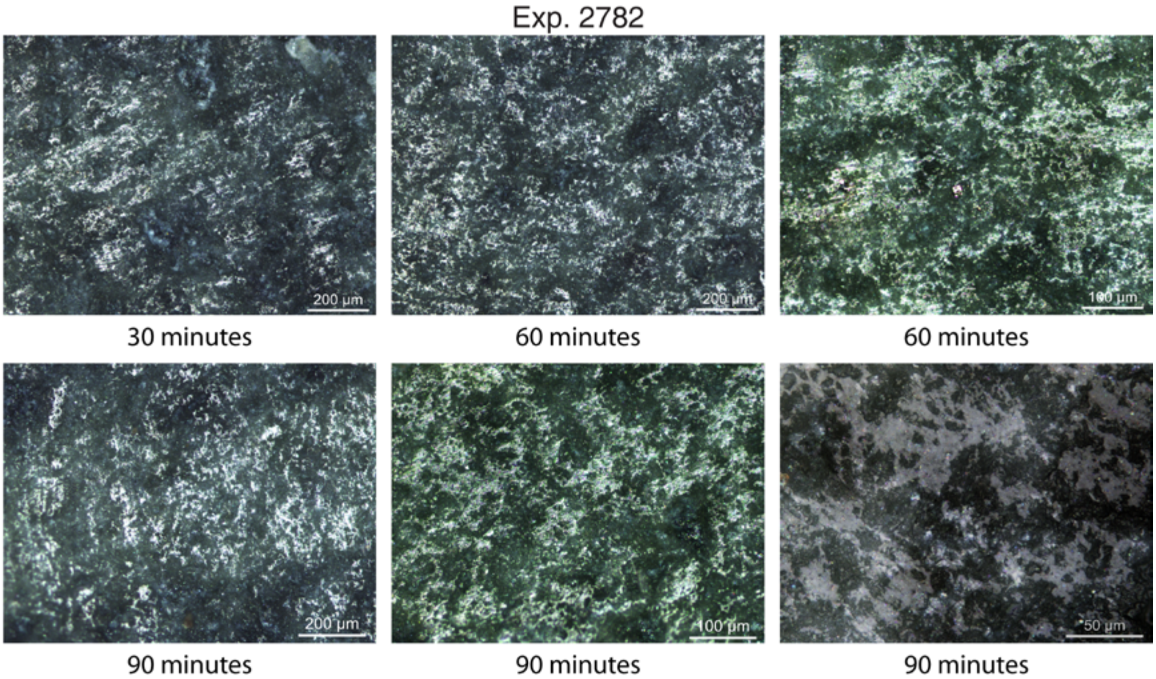

Figure A5: Various surfaces from greenschist-facies overprinted rock 2782 abraded against a fine-grained sandstone of high cohesion (3047) with water.

previously described experiments, however, the distribution of polish is much more irregular and these structures fluctuate in size (Figure A5). Moreover, as the polishes connect, the elongated gouges of the stereoscopic scale are made visible within them, skipping over numerous interstitial spaces in between. The polish itself has become heavily striated in certain areas (Table 2, *Striations in polish*). The macroscopic lustre is patchy and diffuse as a result of the erratic polish distribution, with a moderate shimmer.

This wear trace signature clearly results from abrading asperities wearing down the surface of the blank, striating the polish to a degree not seen in previous experiments. It seems as if the interaction was dependent solely upon hard and cohesive (static) asperite grains to enact abrasion, while the load associated with fatigue failed to materialise. Thus, the topography of the blank was not structurally weakened and crushed to the degree seen before. The absence of intermediate particles shed from the cohesive sandstone platform appears a requirement for this to happen. Other variables involved could be a comparatively lower structural resistance of its matrix, or unnoticed differences in the load exerted by myself compared to the other experiments.

Exp. 2515-A – greenschist blank on coarse-grained sandstone (3048) – 30, 60 minutes, water additive

This particular platform proved inefficient for the abrasion of hard lithics, probably due to the relative coarseness of its grains. The stereoscopic topography of the blank obtained a frosted appearance, as the high points were barely lowered and most of the surface areas, laying slightly lower, remained unaffected (Figure A6). The interaction further resulted in a strongly developed dull microwear polish with roughness and non-invasiveness corresponding to typical contact with a stone. The polish structures are strongly ploughed displaying the pathways created by asperities on the opposing sandstone, revealing the larger size and occasionally sub-angularities thereof. The texture otherwise accords with the crushing of asperities, though with more of a smeared appearance that suggests

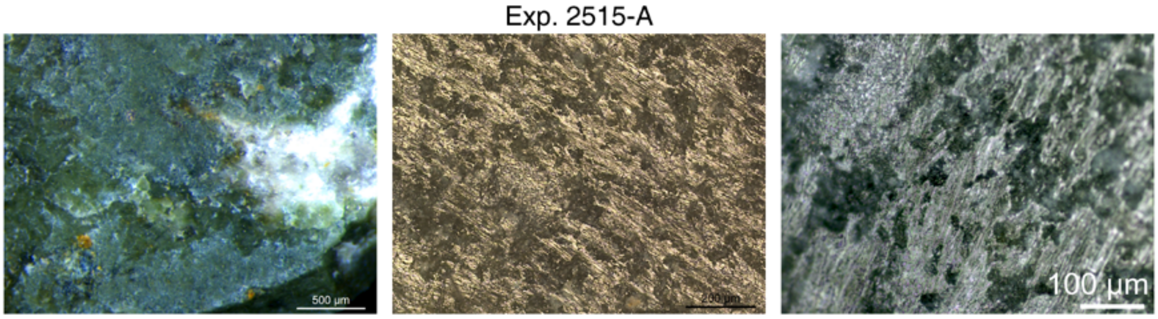

Figure A6: Various surfaces from greenschist-facies rock 2515-A abraded for 60 minutes against a coarse-grained sandstone (3048) with water.

some of it consists of matrix displacement from the abrasion. The macroscopic lustre is fairly dull and interrupted.

Exp. 2514 – greenschist blank on Acropora palmata *(2476) –30 minutes, water additive*

This experiment relied upon the mechanical properties of the stony coral and its tendency to shed slurry-forming carbonaceous powder under load to facilitate the abrasive function. As a result, the greenschist blank abraded the coral platform at great pace while itself sustaining only minor wear. The surface is poorly levelled and shows a frosted appearance, corresponding to a continuously interrupted, almost pearly lustre. The microtopography contains large, rough, and bright stone scratches (see Table 2, '*Stone scratches*') on the peaks, defined as interrupted ploughing marks consisting of internal striations. There are intermittent flat polish structures (loose and separated distribution). The underlying surface shows some crushing and occasional striations, probably derived from the carbonaceous slurry (Figure A7).

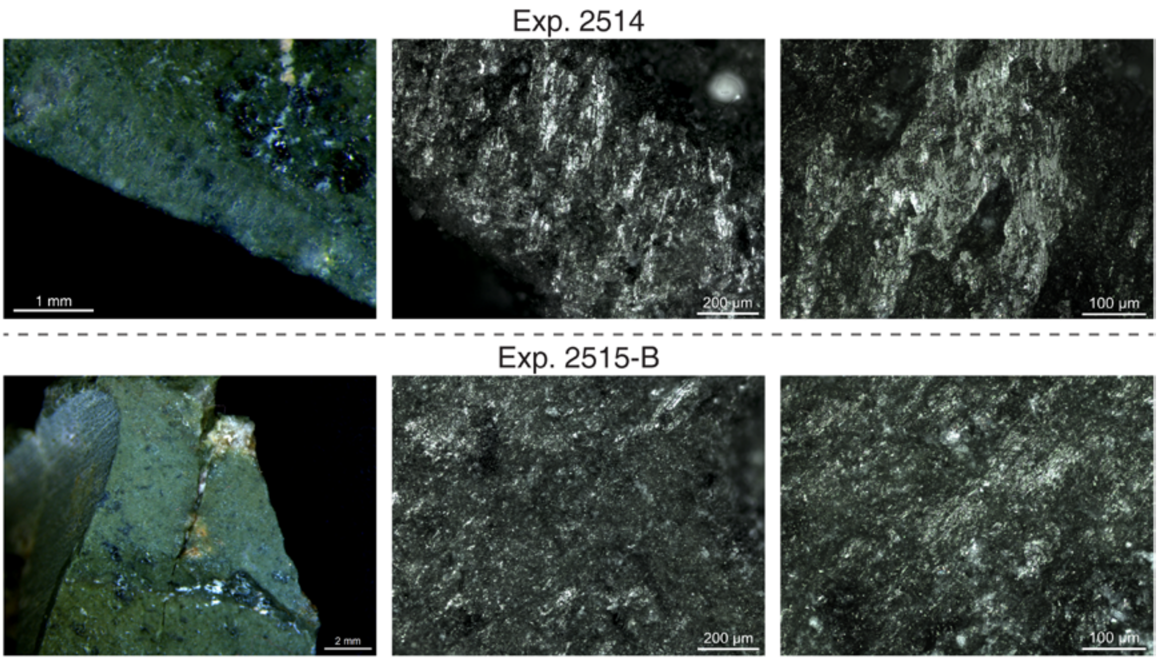

Figure A7: Various surfaces from greenschist-facies overprinted rock blanks abraded for 30 minutes on *Acropora palmata* with water (2514) and water and quartz sand (2515-B).

Exp. 2515-B – greenschist blank on Acropora palmata *(2574) –30 minutes, water and quartz sand additives*

This experiment reduced the surface of the blank at a relatively slow pace. Seen from the stereoscope the levelling is very poor, as it instead retained a gradual sinuous gradient. The primary type of microwear is the evenly spread and slightly wavy bright scintillation draped over the surface topography. A rough and poorly developed polish occurs on the peaks, loosely patterned after the grinding motion (Figure A7). Macroscopic lustre is not exhibited.

This wear evidently result through abrasion from the freely moving quartz grains in conjunction with fatigue load. The presence of some polish is perhaps associable to the presence of carbonaceous particles from the stony coral. Apart from that the microtopography is analogous to that of experiment 3037, and comparable to that of exp. 2550.

A1.2 List of experiments indicated in Chapter 5, Section 5.3

Table A1: Shellworking and boneworking experiments. For a full description and ancillary experiments, see Breukel and Falci (2015), and for *L. gigas* and *Spondylus* sp. also Falci *et al.* (2017b).

Blank material	Activity	Tools	Lubricant	Time	Efficiency	Notes
L. gigas lip	Incising, sawing	Flint blade		20'	Effective	
L. gigas lip	Incising, sawing	Flint flake	Sand, water	135'	Effective	
L. gigas lip	String-sawing	Cotton string	Sand, water	100'	Effective	
L. gigas lip	Grinding	*A. palmata*	Water	30'	Effective	
L. gigas lip	Grinding	*A. palmata*		30'	Very effective	Frictional heat modified surface
L. gigas lip	Palm drilling	Hafted flint bit		-	Effective	
L. gigas lip	Bow drilling	Hafted flint bit		-	Very effective	
L. gigas lip	Mechanical bow drilling	Hafted flint bit		-	Very effective	
L. gigas lip	Bow drilling	*G. officinale* point	Sand, water	103'	Effective	Initial perforation set using flint
Oliva sp.	Incising, sawing	Flint blade		60'	Effective	Perforated
Oliva sp.	Grinding	*A. palmata*		60'	Effective	
Spondylus sp.	Groove-and-snap	Flint flake		63'	Effective	Effective snap
Spondylus sp.	Notch incising	Flint flake		25'	Effective	
Spondylus sp.	Notching	*G. officinale* flake	Sand, water	91'	Effective	Effectively a sawing motion
Spondylus sp.	Grinding	*A. palmata*	Sand, water	35'	Very effective	*Spondylus* sp.
Spondylus sp.	Grinding	Sandstone	Water	80'	Very effective	
Spondylus sp.	Mechanical bow drilling	*Bos taurus* splinter	Sand, water	110'	Effective	
Cervidae canine	Drilling	*Canis familiaris* canine	Probably none	'90	Probably effective	By A. Verbaas
Bos taurus, fresh	Incising, single strokes	Flint		-	Very effective	
Bos taurus, fresh	Incising, single strokes	Cervidae premolar, cusp		-	Effective	
Bos taurus, fresh	Incising, single strokes	*Spicula sp.*		-	Good	Fragmented edge
Bos taurus, fresh	Incising, single strokes	*A. opercularis*		-	Moderate	Notched edge
Bos taurus, fresh	Incising, single strokes	Arcidae		-	Good	Notched edge

Bos taurus, fresh abraded	Incising, single strokes	Flint	-	Very effective	
Bos taurus, fresh abraded	Incising, single strokes	Cervidae premolar, cusp	-	Effective	
Bos taurus, fresh abraded	Incising, single strokes	*Spicula sp.*	-	Good	Fragmented edge
Bos taurus, fresh abraded	Incising, single strokes	*A. opercularis*	-	Moderate	Notched edge
Bos taurus, fresh abraded	Incising, single strokes	Arcidae	-	Good	Notched edge
Bos taurus, cooked	Incising, single strokes	Flint	-	Very effective	
Bos taurus, cooked	Incising, single strokes	Cervidae premolar, cusp	-	Effective	
Bos taurus, cooked	Incising, single strokes	*Spicula sp.*	-	Good	Fragmented edge
Bos taurus, cooked	Incising, single strokes	*A. opercularis*	-	Moderate	Notched edge
Bos taurus, cooked	Incising, single strokes	Arcidae	-	Good	Notched edge
Calcite	Incising, sawing	*L. gigas* flake	4’	Effective	Little tool wear
Calcite	Bow drilling	Flint	27’	Effective	

Appendix 2

Experimental woodworking and review of wood properties and archaeological use

This appendix provides data on various wood species from both experimental and archaeological perspectives. I will first detail what the principle variable of specific density refers to and how it is reported throughout the work, and reference the sources of other measurements in Table 3. Section 1 contains information on the wood species experimented with, and the resulting wear trace patterns are described in section 2. Section 3 contains an overview of wood species that are either archaeologically identified, or emphasised in ethnohistoric sources, as having been utilised towards specific tangible purposes.

Specific density and secondary values

The variable of specific density is calculated after the weight and volume of a wood. The standard notation uses oven dry mass/green volume and provides these values in weighted g/cm^3, of which a value of 1.0 equals the density of water. The Global Wood Density Database (Chave *et al.* 2009; Zanne *et al.* 2009) forms the main source since it compiles much of the values reported in the literature and harmonised the notations. Other types of notations common in the literature are kg/ m^{-3} or lb/ft^{-3}, and the measurement of volume at 12% moisture content, all of which result in different numbers. The specific density of a wood is highly correlated with wood structure, mechanical strength, and various measures of hardness (Chave *et al.* 2009). For instance, they can be used to calculate Janka side hardness values (which measure the resistance to indentation) in N and are calculable using the formulas provided in Wiemann and Green (2007) and the *Wood Handbook* (FPL 2010). Specific density therefore forms an appropriate index to differentiate wood species with in the examination of wear. In any given interaction of wear, different properties of the contact material will lead to distinguishable outcomes. This implies the ability to methodologically distinguish softer, medium, and harder timbers.

Specific densities are here reported by the range averaged from the available values, which are simplified by removing outlier measurements, non-Neotropic measurements, and retracting a level of significance. The purpose of this is to ease the average comparison of various woods as it is not feasible to assess the worth of every single measurement. To illustrate these conditions, of the 33 measurements provided for *Ceiba pentandra*, 17 remain that are taken of specimens in tropical South/ Central America. The lowest measurements are at 0.21, 0.22, and 0.23, whereas the highest are at 0.52, 0.51, and 0.489. In the text, I consider them as ranging from 0.22 to 0.5, and in this case highlight that the average measurement falls between 0.25 and 0.36 since only a single value is reported between the measurements of 0.36 and 0.489. Of the seven measurements for *Guaiacum* *spp.*, one is of a non-Caribbean species (*G. coulteri*) and another indeterminate, these are at 1.1 and 1.05 respectively. The others range between 1.08 for both Caribbean species to 1.1 (*G. sanctum*, two in total) and 1.25 (*G. officinale*, four in total). The effective specific density range is thus at least 1.1 to 1.2 (the second highest measurement). If no data is available for the species in question, or this is not identified, I compile from the genus if a clear trend exists and indicate otherwise.

These values are therefore averages, sometimes derived of few measurements. The specific densities of the wood in individual trees actually varies depending upon age and the radial trend of the species: in angiosperms, sapwood is usually less dense than heartwood. It is the latter wood that is most often measured for a species value, whereas it is the former wood that accounts for a significant portion of wear contact (Chapter 5). It seems to be the case that this variation is no more than ca. 2 decimals in either radial direction (Woodcock and Shier 2002), but these data are generalised and significant individual fluctuation is noted. On the absolute scale of 0.2 to 1.2 these differences are not large enough to shift the weight between different hardness groups, but future research into this variable for wear trace studies should ideally measure and report the specific density from the experimental wood sample in question. In species accumulating silica, bark and sapwood also contain much higher SiO_2 wt.% (Fullagar 1991).

A second reason to do is that specific density values from the published (and grey) literature are based upon idealised averages of moisture content, in order to render them comparable. In real time, the moisture content of any given part of a given wood from a given species will be the average wt.% of water in healthy living wood minus potential loss from suboptimal health, and once cut affected by environmental conditions, including drenching and continued seasoning. The measure of specific density for a given piece of wood will fluctuate accordingly.

Secondary data regarding the specific density, general hardness, toughness, comparative weight, and texture of the grain are given following the average position between Chudnoff (1980), Little and Wadsworth (1964), Longwood (1971), Pittier and Mell (1931), and Wiselius (2005), supplemented by the online sources wood-database.com and eol.org. Silica content cannot be considered due to the lack of data regarding relevant species. Since these sources do contain this information for other species, it is quite possible that none of them are significant silica accumulators. While Fullagar (1991) demonstrates silica to be a significant factor influencing the development of wear from wood, his results seem to correlate better to the average specific densities of the woods involved. To my knowledge, there are no specific correlations between silica content and specific density. Nevertheless, I would expect woods containing higher silica contents to be tougher and heavier than comparable woods without, so the variable may be indirectly captured.

A2.1 Experimental woods and overview of sequence

Five woods were experimented with, these are described here in greater detail.

Swietenia mahagoni

The West Indian mahogany is native to the western Greater Antilles, but can nowadays also be found in most eastern Caribbean islands (Acevedo Rodríguez and Strong 2012, 563). It is a large-growing tree of the dry coastal forest. Its heartwood is strong, moderately hard, and heavy, resists decay and insect attack very well, and it is known for its workability and lustrous appearance (Little and Wadsworth 1964, 250-252). The specific density of this species stands at 0.75 g/cm^3, though this is probably an upper value for green wood (cf. Longwood 1971, 83). Considering the secondary sources provides a lower value of ca. 0.55 g/cm^3. A large number of tropical woods are marketed as mahogany due to the positive associations with the name, and in commercial circles 'genuine' mahogany refers to *Swietenia macrophylla* (Honduran mahogany) of which the wood is softer and lighter (Chudnoff 1980; FPL 2010).

West Indian mahogany was historically considered as an excellent ship-building wood due to the exceptional dimensional stability of the wood, preventing it from warping and shrinking. However, overharvesting has led to the extirpation of trees with wider girth, and modern specimens no longer attain historical dimensions. Archaeologically, the wood was used for house construction elements and the carving of objects such as paddles. The smaller 'Stargate' canoe from South San Andros Island is purportedly made of mahogany (Callaghan and Schwabe 2001, cited in Fitzpatrick 2013), and the Kalinago are said to have use this wood for canoes in historic times (Atwood 1791, 24). However, the tree is considered exotic to the Lesser Antilles (Acevedo Rodríguez and Strong 2012, 563). Lovén (1935, 411) identifies *S. mahagoni* as the indigenous tree known by the name *caoba*, a word which has myriad other implications and is connected to sacred ritual.

Calophyllum brasiliense var. *antillanum*

Galba, as it is known in St. Vincent, is native to the circum-Caribbean region (Acevedo Rodríguez and Strong 2012, 203). It is a very large tree that grows best in moist forest from the coast to the lower mountains. The wood is fairly strong, hard, and moderately heavy, and durable to decay but not to insect attack. It fairly easy to work despite being medium to coarse in texture, often with interlocking grain (Chudnoff 1980, 65-66; Little and Wadsworth 1964, 348). The specific density of *C. brasiliense* stands at 0.5-0.7 g/cm^3 in Zanne *et al.* (2009), there are no separate distinctions from *C. b.* var. *antillanum*. Most sources place the range somewhat lower, at ca. 0.51-0.57 g/cm^3, but an upper value of 0.70 is supported by Longwood (1971).

The wood is a widely regarded construction material, and it was regarded as very suitable to this purpose by the local collaborators in the St. Vincent construction project. The common name in the Spanish Islands, (santa) maría, is said to be of indigenous origin (Little and Wadsworth 1964, 350). If so, it may be an early colonial Hispanisation of the tree previously known as *mari-a*, of which the corresponding species is not recorded. Lovén (1935, 411, 419-420) notes the indigenous *mari-a* as a sacred tree, used especially for constructing canoes.

Chimarrhis cymosa

Waterwood is a medium-sized tree endemic to the Greater and Lesser Antilles (Acevedo Rodríguez and Strong 2012, 804), growing primarily in the lower montane rainforest and commonly bordering streams. The wood is strong and durable, moderately hard, and of medium-coarse texture, and reported as easily workable (Longwood 1971, 99). The specific density of *C. cymosa* is reported at 0.71 g/cm^3, which is the average of the 0.65-0.85 g/cm^3 range reproduced in Longwood. It was considered a suitable timber in the construction project, used for overhead beams, but its use is not known archaeologically.

Coccoloba uvifera

Seagrape is a common sight on many of the Antillean coastlines, and is native throughout the circum-Caribbean region (Acevedo Rodríguez and Strong 2012, 774). It is a smaller tree that grows on sandy shores, often with twisting, curving trunks due to constant exposure to the sea winds. It provides a (very) hard and heavy, strong, close-grained wood (Little and Wadsworth 1964, 82; Pittier and Mell 1931, 10-11). The specific density of *C. uvifera* is reported at 0.7 g/cm^3. Seagrape was a recommended material by the local collaborators who praised it as a hard and dense wood, good for construction. Though it is capable of taking a fine polish, is not as often utilised in construction or craft on account of the ill-suited growing conditions. It is, however, a popular fuelwood, and *Coccoloba* sp. has been archaeobotanically argued as such in Ostionoid El Bronce, Puerto Rico (Pearsall 1985, in Newsom 2010).

Prosopis juliflora

Cambrón, which our collaborators in St. Vincent called 'Bleary cedar' or 'coco shade' (unregistered vernacular names), is a xeric tree shrub native to Central and South America. It is commonly found in the Caribbean islands, and considered native by Acevedo Rodríguez and Strong (2012, 454-455) though not by others. Historically, it is described as early as 1598 by López de Castro and under the name algarroba by Fernández de Navarrete in 1680 (Esteban Deive 2002, 271, 298). In St. Vincent, the most likely identification was given based upon the morphology of the bi-pinnate leaves, yellow fruit pods, and paired thorns. The wood is tough and strong, heavy, and moderately hard, being also easy to work and resistant to decay (Little and Wadsworth 1964, 166). The specific density is reported at 0.75-0.8 g/cm^3.

P. juliflora is a quality fuelwood which burns cleanly and produces high energy value charcoal (Oduor and Githiomi 2013). It is occasionally used for fencing and woodcraft, and in St. Vincent is often planted to provide shade. The tree grows on the sites of El Flaco and Argyle today. However, wood from its genus has not been identified archaeologically in the Caribbean.

A2.2 Experimental results from chopping wood and various hafting arrangements

As explained in section 5.2.2, all wear traces described below are taken on the area of the bevel from where it borders the edge to ca. 5 mm behind it, tapering out towards the lateral sides. The locations of consecutive individual micrographs do not correspond across a sequence, however. This is chiefly because they show the most representative and best developed characteristics of the wear traces discussed, of which the location varies. There are no significant differences in wear trace development between the bevels from either opposing face.

Table A2: Biography of experiment 2550.

Stage	Start date	User	Activity	Contact material	Time	Notes
Roughout	-	D. Pomstra	Pre-shaping	Power tools	Unknown	Done with modern equipment
Manufacture	-	D. Pomstra	Grinding, wet	Sandstone exp. SWH	Not measured	See Appendix 1.1, exp. 2550
Unused	25.01	F. v.d. Leden	-	None	0	Cast #1

Hafting 1			Male transv. emb	*S. mahagoni*	30	Broke quickly
Use	26.01	F. v.d. Leden	Felling	*S. mahagoni*	30	
Casting	26.01					Cast #2
Hafting 2			Male transv. emb	*S. mahagoni*	315	
Use	27.01	F. v.d. Leden / T.W. Breukel	Chopping	*S. mahagoni*	12+58+25	Relatively fresh wood
Casting						Cast #3
Use	28.01	T.W. Breukel	Chopping	*S. mahagoni*	34+36	Some contact with heartwood
Casting						Cast #4
Use	29.01	T.W. Breukel	Chopping	*C. b.* var. *antillanum*	54:45	Includes few contact minutes with Spanish Ash (unknown) and *Dicorynia guianensis*
Use	30.01	T.W. Breukel	Chopping	*C. b.* var. *antillanum*	33	Micro nicking, soil particles present in finishing stages
Casting						Cast #5
Use	30.01	T.W. Breukel	Chopping	*C. cymosa*	15	Wood pulp formed
Use	31.01	T.W. Breukel	Chopping	*C. cymosa*	49	Wood few days old
Hafting 3			Male transv. emb	*S. mahagoni*	261	Deeply embedded
Use	02.02	T.W. Breukel	Chopping	*C. cymosa*	27:15	Wood a week old
Casting						Cast #6
Use	02.02	T.W. Breukel	Chopping	*C. uvifera*	39:30	Felling living wood
Use	03.02	T.W. Breukel	Chopping	*C. uvifera*	36:15	Fresh wood, some microretouch formed
Casting						Cast #7
Use	03.02	T.W. Breukel	Chopping	*C. uvifera*	44:45	Felling desiccated wood
Casting						Cast #8
Use	04.02	T.W. Breukel	Chopping	*P. juliflora*	113.30	Felling reaction wood, thereafter most contact against heartwood
Casting						Cast #9

Exp. 2550, phase 1 – chopping Swietenia mahagoni *– 30, 125, 195 minutes (195 consecutive minutes)*

The first observation to be made in this experiment pertains to the smoothening of the manufactured micro-topography, as peaks become less distinctive and the relief is diminished. Some development of use wear traces takes place already after 30 minutes, which occur as isolated patches of rough textured polish that infrequently connects in a reticulating pattern at higher elevations (Figure A8, a; Table 4, *Rough*). On the whole, though, wear is uncommon over the surface and is typically generic and undeveloped. This changes after 125 minutes, when the traces become more wide spread and distinctive. Individual spots of polish have clearly increased in size and begun to connect on the higher areas. These are consistently oriented in parallel or perpendicular bands, interrupted by topographical lows. The texture is smooth, though uneven, and striations appear in the polish following the

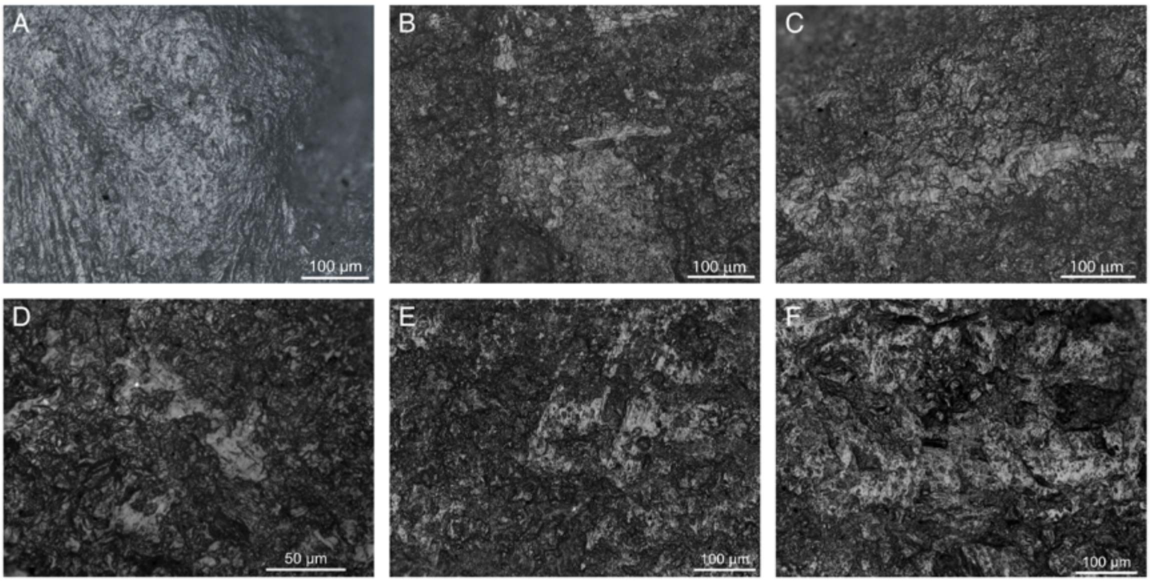

Figure A8: Pronounced developments of microscopic woodworking traces on *S. mahagoni*, seen after 30 minutes (A), 125 minutes (B and C), and 195 minutes (D), and on *C. b.* var. *antillanum*, seen after 88 minutes (E and F).

downward direction of the chopping motion perpendicular to the centre of the edge (Figure A8, b, c).

Some doming in the topography is noticeable, but this characteristic is better expressed after 195 minutes of work. At that point the distribution has grown more extensive and is directional in most places, though it remains low with isolated spots of polish interspaced with polish structures patterned as bands. Pitting is now observable in the larger patches, which are otherwise texturally comparable with only a slight reduction in unevenness (Figure A8, d; Table 4, *Pitting*). Some degree of invasiveness is apparent, shown as scintillation occasionally observed on the slopes, though remnant grease generally interfered in the observation of this characteristic.

Exp. 2550, phase 2 – chopping Calophyllum brasiliense *var.* antillanum *– 88 minutes (283 consecutive minutes)*

Upon the conclusion of this phase, the surface microtopography had underwent significant changes. The polish structures are small to medium sized and are spread more evenly and densely over the surface than before (Figure A8, e-f). In some areas they interlink across the topographic heights as larger structures, in others the polish remains mostly on separate asperities. Their texture is mostly smooth and pitted, with a slowly dulling rough-textured scintillation in the lower areas. The topography is domed (Table 4, *Standard*), while both striations and a corrugating directionality are occasionally present. Compared to the preceding traces on *S. mahagoni*, the polish distribution is more evenly developed with larger and smoother structures (Table 4, *Smooth*).

Exp. 2550, phase 3 – chopping Chimarrhis cymosa *– 92 minutes (375 consecutive minutes)*

Upon the conclusion of this phase, the surface microtopography had underwent dramatic changes. The distribution, size, inter-linkage and overall intensity of the polish all diminished severely, though the brightness actually increases and the topography remains domed. The traces no longer cover most larger areas, including ridges and higher plateaus as they did before, but occupy isolated peaks instead (Figure A9, a, b). Conversely, the upper slopes are defined by a rough, weak development of

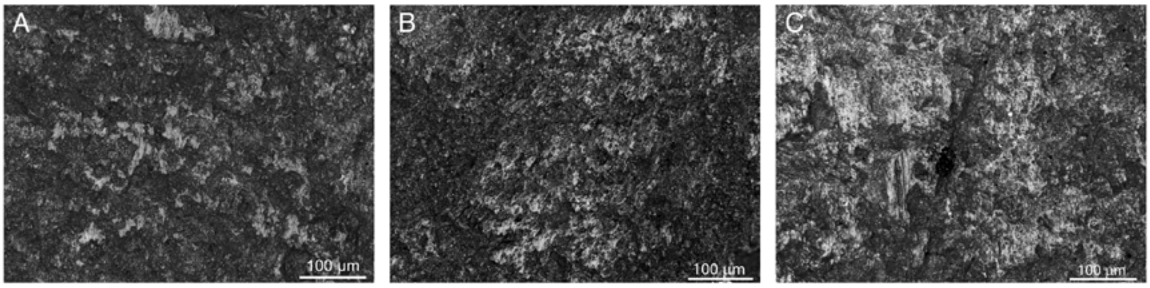

Figure A9: Examples of wear traces on the topography from chopping *C. cymosa*, seen after 92 minutes.

wear (Table 4, *Invasive – upper slopes*). This degree of invasiveness was not seen in previous phases, but perhaps due only to obstructing grease on those surfaces. Otherwise, the appearance of the polish from *C. cymosa* remains comparable (more so to *S. mahagoni* than *C. b.* var. *antillanum*), displaying a smooth and slightly undulating texture. Some directionality has been observed, oriented towards the centre of the edge.

It is clear that the activity induced a higher rate of attrition on the surface and thereby removed the developed traces from the previous experimental phase. This seems associable to the experiential toughness of the wood and perhaps relates to a different balance in modes of wear. However, determining which of those modes operate in woodworking and how they do so is a topic that needs investigation in general.

Exp. 2550, phase 4 – chopping Coccoloba uvifera *– 76, 120 minutes (495 consecutive minutes)*

This phase contains two moments of observation, coinciding with the state-change of the contact material (from felling fresh wood to felling desiccated wood). For the freshly felled state only the appearance of the resulting polish is observable in certain areas, unremovable grease obstructing an assessment of other characteristics (chiefly topography below the peaks, polish distribution, invasiveness, and density). The texture of the polish is rougher than before, and striations are absent (or obscured) though some measure of directionality remains apparent. The topography is more clearly domed, however, and where the topography permits it individual polish structures reticulate (Figure A10, a-b). While it appears that the contrast with the interstices is more gradual and lower elevations display a greater degree of modification, this is impossible to verify for the aforementioned reason. However, the overall density of wear seems to be distinctly greater than seen in previous contact phases.

For the traces resulting from chopping wood in a desiccated state, the casts were free of grease and permitted good view. Here, clusters of well developed, large, connecting polish appear. These are bright and near-smooth in texture, with minor pitting and cratering as a result of reticulation across interstices (Table 4, *Reticulating*). The topography is extensively domed, which contrasts the moderate degree of scintillation seen on the slopes (Figure A10, c); the effect is particularly pronounced where mineralogical differences in the bevel create contrast (Table 4, *Extensive*). However, other areas are rough in texture and carry medium to coarse striations within the polish (Figure A10, d). Further out, deep gouges are sometimes visible (stereoscopic striations) and such locations show linkage only with the nearest structures (Table 4), in spite of a general similarity in the high distribution of polish. These differences are more marked than they are for the experiments with fresh wood, and can be explained by the lower relative moisture level resulting in a less yielding material. Such a body would induce

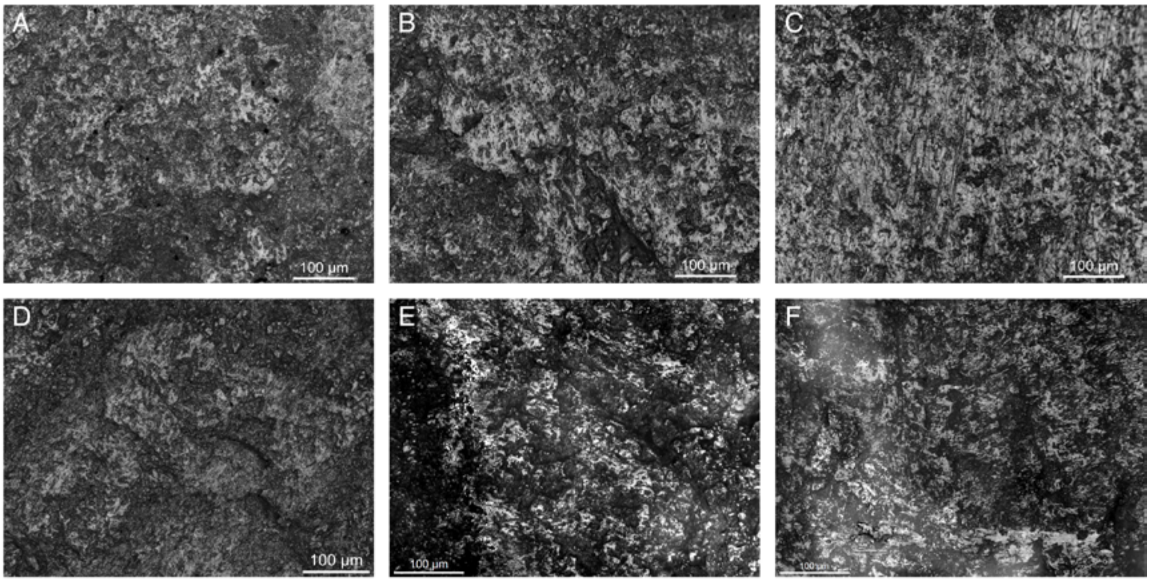

Figure A10: Examples of wear traces on the topography from chopping *C. uvifera*, seen after 76 minutes (A in fresh state) and 120 minutes (B-C in desiccated state), as well as examples from chopping P. juliflora seen after 113 minutes (D from cast, E-F from experimental surface).

heightened abrasive wear on the surfaces in most heavy contact (near the edge, best smoothened out, carrying the most intense development of polish), resulting in a comparatively greater reduction of the topographic relief permitting larger polish structures to form in the centre. This reduction is not as pronounced in surfaces further away from the point of contact, which experience lower friction from the edge sliding into the wood and thus retain higher relief and less further modification from each impact.

Exp. 2550, phase 5 – chopping Prosopis juliflora *– 113 minutes (608 consecutive minutes)*

This phase concludes the use of exp. 2550, and the resulting traces were analysed from both the casts and the surface. Compared to previous contact with the other types of wood, the resulting polish consists of smaller structures that are not as domed, only occasionally affecting the upper slopes of the topography. The texture is smooth but more uneven, not quite rough, and pitting is pronounced (Table 4, *Smooth/uneven*; Figure A10, e-h). A high degree of interlinking is observed in certain areas, and the polish is overall well distributed across the zone with wear from use. Directionality is sometimes present, oriented perpendicular to the edge. The surface also contains striations forming a hard material polish considered extraneous to the use on wood, formed either during the difficult de-hafting process or by schoolchildren visiting to the reconstruction project in the final days (which got their hands on the implement at two different occasions and briefly attempted chopping random pieces of wood and soil with it).

Exp. 2550 – hafting with Swietenia mahagoni *– 608 minutes*

At the conclusion of the experiment, the lateral sides had developed little to no wear from the haft. Whereas the tension is clearly visible on the haft itself (Figure A11, a), this is not the case on the lithic head. One aspect developed a slight colour difference indicating micro-topographical alteration, while some spots of semi-rough, domed polish was seen on the other. These were not particularly diagnostic, however, in light of the occasional rough flatter polish structures accompanying the manufacturing

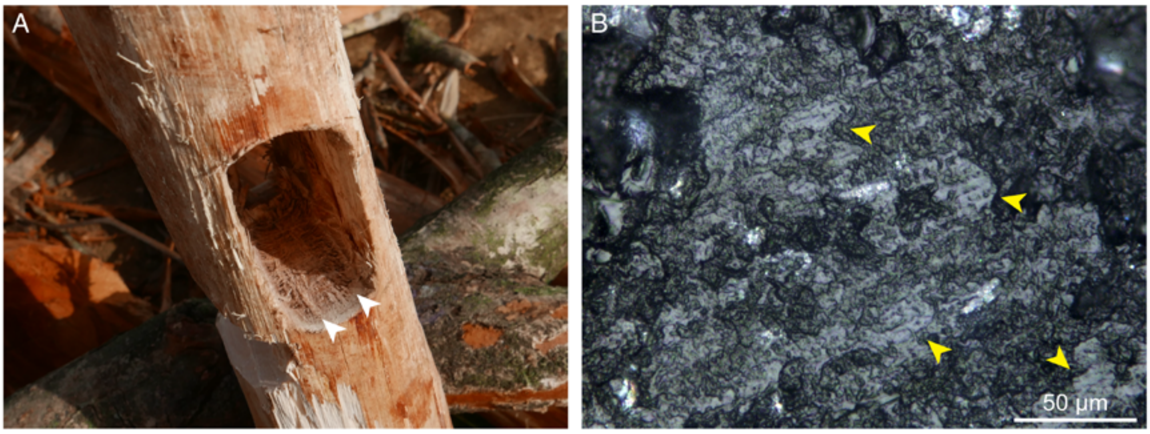

Figure A11: A) Hafting friction inside the haft after 315 minutes of contact and six days of use. B) Incipient wear traces from friction with wood developing on the face.

wear. The greatest development of wear occurs towards the distal facial zone. Here, incipient patches of polish indicating friction with wood are developing over the widespread manufacturing wear (Figure A11, arrows in b; cf. Figure A3, b). The presence of these traces on the faces is best explained by these areas having relative freedom of motion, and making on-and-off contact with woody fibres left inside the perforation. This kind of contact is unlikely to develop much further, yet forms clearer evidence at present than the topography of the areas locked in friction with the haft.

Exp. 2551 – prehensile contact on greenschist-facies overprinted volcanic – 135 minutes

The changes that occur on the microtopography correspond to an incipient development of typical prehensile wear, as a soft contact material. The higher points on the surface are covered by greasy polish, while most lower asperities became more rounded and scintillating (Table 4, *Texture – greasy*; Figure A12, a). Macroscopically, the affected areas became darker, partially from the rounding, partially relating to adhesive wear interacting with the oils of the human skin. This result underlines the slow nature of the formation of prehensile polish on fine-grained rocks, of which the experimental replication was exacerbated by physical irritation accompanying the motion. Past actions must instead be conceptualised as an extended period in which multiple short contacts adjoin, in which such an incipient polish as resulting in exp. 2551 would correspond to fairly active and prolonged activity with the piece.

Exp. 2552 – sun-dried P. juliflora *contact on greenschist-facies overprinted volcanic – 30 minutes*

The microtopography is affected by a widespread dull and rough polish on the upper surface, which in some cases develops small domes, brighter but isolated (Figure A12, b). The dull and rough modification has some invasiveness, but the degree to which lower lying micro-elevation is affected differs. The stereoscopic distribution is clearly a factor of which higher ridges on the surface of the blank were in contact with the wood, since the lower lying topographical zones are completely unaffected (Figure A12, c). A slight directionality is present, and a few non-related striations from environmental particles are observed. Wear development seems slow, and most archaeological hafted zones are expected to present more developed traces.

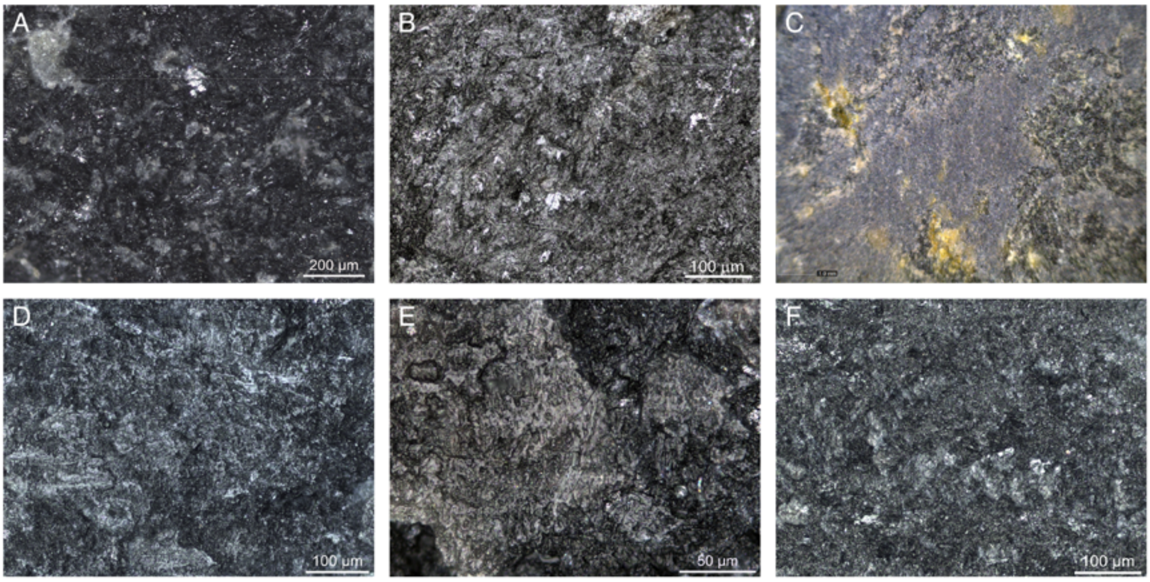

Figure A12: Micrographs of various types of friction on greenschist-facies overprinted volcanic blanks. A) incipient wear from 135 minutes of prehensile contact (exp. 2551). B and C) wear from 30 minutes of sun-dried *P. juliflora* contact (exp. 2552). D and E) wear from 30 minutes of soaked *P. juliflora* contact (exp. 2553). F) wear from 60 minutes of contact with *P. juliflora* bark bindings (exp. 2554).

Exp. 2553 – soaked P. juliflora *contact on greenschist-facies overprinted volcanic – 30 minutes*
The upper micro-topography developed large spots of domed polish, smooth/uneven and with clear corrugation indicating directionality from the load (Table 4, *Corrugation*). These are irregularly distributed over the surface. Elsewhere, the polish remains domed but individual structures are smaller, more rough than smooth/uneven, and dull (Figure A12, d-e). They interconnect across topographical highs but are intensely pitted, and descend towards generic scintillation on the slopes and interstices. Compared to the seasoned wood experiment, the wear affected a much larger part of the macroscopic surface. These were darkened, topographical boundaries were smoothened and particles unaffected from the preparatory grinding were rounded off. The lower laying topographical areas did not develop traces, in spite of the significant adherence of wood pulp therein.

Exp. 2554 – P. juliflora *bark bindings contact on greenschist-facies overprinted volcanic – 60 minutes*
Relatively minor wear developed during this experiment. The affected surface areas are characterised by a connected/covering, rough, and invasive polish that rounds off larger topographical irregularities (Figure A12, f). Small particles and asperities are not affected, and only few brighter peaks developed. The traces do not contrast the underlying 'manufactured topography' well and could also be confused with the 'sand-ground' wear signature. Striations resulting from previous grinding remain visible, if somewhat rounded by the interaction. In all, the wear is considered indistinctive for interpretation of the contact material. However, it is set apart by invasiveness exceeding that of manufacture on lithic platforms. Archaeologically, the spatial association with the original extent of a haft would form a supporting line of evidence.

A2.3 Overview of archaeological data

This paragraph provides a review of identified woods from the archaeological Caribbean. The five main cultural activity groups that involve the physical working of wood are an outcome of this review. These are indiscriminate land clearance, silviculture and harvesting, canoe building, construction work, and the carving of portable objects. Alternative activities, such as medicinal, extractive (dyes etc.), or relational are not the focus since these are unlikely to create traces of wear on the same scale. The selection is restricted to the oceanic islands and excludes Trinidad, Tobago, and the Southern Antilles since these belong to different biogeographical regions. Table A3 provides an overview of the identified species at a glance, whereas the text provides an overview of each activity group and provides additional detail on identified wood species and corresponding references. It contains the most important trees but is not considered representative beyond that, given the limited research that has been done on identifying archaeological woods, themselves subject to preservation biases, and the difficulty in obtaining many sources. Nevertheless, patterns stand out.

Table A3: overview of archaeobotanically and/or ethnohistorically identified wood species. Details concerning these identifications are available in the text.

Wood species	**Common synonyms**	**Common name used presently**	**Specific density range (from *n* weighed measurements)**	**Activity groups**	**Comments**
Swietenia mahagoni		Mahogany, West Indian mahogany, *Caoba*	0.75 (*n*=1)	Construction timber, object carving, canoe building	Secondary sources report values as low as 0.55 g/cm^3
Calophyllum brasiliense var. *antillanum*		Galba, María, Santa María, Ocuje	0.5-0.7 (*n*=14)	Construction timber (modern), canoe building	Possibly the indigenous tree *mari-a*
Chimarrhis cymosa		Resolu, Waterwood, Bois rivière	0.71 (*n*=1)	None	
Coccoloba uvifera		Seagrape, Uva del mar	0.7 (*n*=1)	Fuelwood	
Prosopis juliflora		Cambrón, Bleary cedar, coco shade	0.75-0.86 (*n*=5)	Fuelwood	
Possibly *Inga laurina*		Spanish Ash	*I. laurina*: 0.62 (*n*=1)	None	Briefly used during experimental project, small branch, splintered
Dicorynia guianensis		Angelique	0.47-0.67 av. 0.60-0.68 (*n*=9)	None	Briefly used during experimental project. Strong, durable wood
Bursera simaruba		Copperwood	0.24-0.34 (*n*=6)	Fuelwood	
Trema sp.			Ca. 0.2-0.45	Fuelwood	Genus range (Neotropics)
Krugiodendron ferreum		Black ironwood	0.95-1.35 (*n*=2)	Fuelwood	
Guaiacum spp.		Lignum vitae, *Guayacan*	1.1-1.2 (*n*=5)	Construction timber, fuelwood, object carving	
Cedrela odorata		Spanish cedar, West Indian cedar	0.34-0.45 (*n*=12)	Canoe building	Extratropical values up to 0.66 g/cm^3
Ceiba pentandra		Silk-cotton tree, *Ceiba*	0.22-0.5, av. 0.25-0.36 (*n*=17)	Canoe building	
Hura crepitans		Sandbox	0.28-0.41 (*n*=12)	Canoe building	

Dacryodes excelsa	*Dacryodes hexandra*	Tabonuco, Gommier	0.39-0.53 (*n*=3)	Canoe building	
Zanthoxylum flavum		Satinwood	0.73-0.9 (*n*=9)	Construction timber, object carving	
Erithalis fruticosa		Black torch		Construction timber	No data
Pictetia aculeata		Tachuelo, fustic	0.8 (*n*=1)	Construction timber	Often compared to *guayacan*
Sideroxylon salicifolium	*Achras/Bumelia /Dipholis salicifolia*	Bustic	0.84-0.9 (*n*=2)	Construction timber	
Sideroxylon foetidissimum		Mastic bully	0.9 (*n*=1)	Construction timber	
Gymnanthes lucida		Yaití	1.1 (*n*=1)	Construction timber	
Bonnetia cubensis		Manglesillo		Construction timber	No data
Acacia sp.		Tamarind	-	Construction timber	Large, divergent genus
Elaeodendron xylocarpum	Reported as *Cassine* sp.	Marble tree	-	Construction timber	No Neotropical measurements; Old World *Elaeodendron* are 0.72-0.80
Croton poecilanthus		Maran	0.60 (*n*=1)	Construction timber	Rest of genus ranges 0.39-0.48 in the Neotropics
Bucida buceras		Ucar	0.69-0.93 (*n*=2)	Construction timber	
Bucida capitata	*Buchenavia tetraphylla*	Ucar	0.5-0.7 (*n*=8)		Alternative species ID for ucar
Pouteria multiflora		Almendrón	0.74-0.80 (*n*=2)	Construction timber	Genus ranges from below 0.5 to above 1.0 g/cm^3
Manilkara bidentata	*Manilkara nitada*	Bulletwood, bálata	0.8-0.95 (*n*=14)	Construction timber	
Haematoxylum campechianum		Campêche	0.88-1.00 (*n*=3)	Construction timber	
Guibourtia hymenaefolia	*Pseudocopaiva hymeneaefolia*		1.00 (*n*=1)	Object carving	
Conocarpus erectus	*C. erecta*	Button mangrove	1.00 (*n*=1)	Object carving	A value of 0.69 g/cm^3 is reported from North America
Pera bumeliaefolia		Black ebony	0.55-0.73 (*n*=9)	Object carving	Genus range
Belairia sp.			-	Object carving	No data
Diospyros sp.			0.47-0.88 (*n*=11)	Object carving	Large and wide-ranging genus
Cordia sp.			Ca. 0.35 to 0.7	Object carving	Large, divergent genus
Carapa sp.			0.42-0.61 (*n*=12)	Object carving	
Caesalpinia vesicaria			0.74-1.2, av. 0.9-1.05 (*n*=15)	Object carving	Genus range

Clearance of plots of land

Land clearance can be roughly divided into the opening up of land for horticulture or agroforestry (swidden) and more general purposes (habitation, trail making, etc.). Though such activities are never truly indiscriminate, it is to be expected that the dominant relation with any 'worked woods' refers to a local ecological community, i.e. all species inhabiting the same plot of land. The general practice of swidden is to cut down all easily felled trees (smaller and younger specimens, probably also certain medium sized species), planning tree falls to take down smaller trees and portions of brush. Subsequent fire setting to the plot clears out most ground level obstacles and fertilises the soil (Oviedo records precisely this in the Greater Antilles, cited in Newsom and Wing 2004, 5-6). Larger trees or those with buttressed roots may be felled with fire or are simply left alone, since the heat of the burning often causes them to lose their canopy. This process therefore entails a series of interactions with green woods of all kinds of specific density measures, without order and probably of fairly short duration for each. The resulting wear trace signature can only be an amalgam of all types of wood contacts, the state of being green the only common factor, and even that is not certain given that there may be working of (partially) charred wood in a subsequent phase.

Theoretically, this activity can be divided into clearing lands in different ecological zones. By way of example, the Kalinago of early historic times located their gardens high up in the mountains (Moreau, 1990), and thus would have to contend with what was probably a multi-story forest rich in species diversity. Little and Wadsworth (1964, 12-17) provide a reconstruction of the dominant species in the main habitats of Puerto Rico, and estimate the coexistence of up to 170 species in its mountainous tropical moist forest. The woods in this type of ecological community are completely different from what is to be expected in the coastal areas and plains, where indigenous habitation sites are located. These types of spaces similarly imply the clearance of land, whilst the untargeted felling of trees may occur for other reasons as well, such as creating space of movement in the form of trails (described in Moreau 1990).

It is not clear if any of these options would result in distinguishable wear. However, it is probable that the later contact woods from the activity will come to dominate the wear trace signature and start to shape it towards its own characteristics. The differences in wear observed from the experimental programme indicate that this likely differs per tree, as it is not known how a 45-minute re-working of mahogany (initially producing weak results) would transform the sequence of traces after e.g. seagrape. The regression induced after working waterwood is notable in this regard, since it shows how the formation of wear is not a simple build-up, and that the equilibrium in which traces develop stably will become upset upon a change in contact materials. The experimental felling times for a single diameter were much shorter than the eventual intervals of sustained contact. This suggest that to obtain a comparable trace formation from a single tree one might look at diameters of at least 20 to 25 cm (to cut in 45 minutes of effort). Considering the factors of teamwork, skill, and gravity induced falls this is probably more.

Silvicultural activities

The main silvicultural activity with archaeobantical evidence for particular wood species is fuelwood, which can be seen partially in the same light as land clearance in its level of discrimination. It stands to reason that untargeted gathering (such as collecting dead branches) would initially result in a representative assembly of local ecological communities. However, there are probably cultural considerations also in selecting woods with higher calorific values or beneficial burning properties (not sparking, fragrance, etc.), and the avoidance of woods with adverse properties such as manchineel (*Hippomane mancinella*). In conjunction with high population densities (e.g. for *Guaiacum* spp.) this may imply the active gathering of living wood as fuel (Cartwright 2018).

Based upon archaeobotanical identifications, there is indeed a large variety of wood species encountered as charcoaled pieces and/or within hearth features (deFrance and Newsom 2005; Newsom and Wing 2004). These range from soft woods (*Bursera simaruba* and *Trema* sp., specific density at ca. 0.25-0.4) to a series of moderately hard woods (at 0.6-0.8) such as *Coccoloba* sp. to very hard woods such as *Krugiodendron ferreum* (at 0.95-1.35). Lignum vitae (*Guaiacum* spp.) in particular has been identified as fuelwood at a number of archaeological sites throughout the Ceramic Age in both the Lesser and Greater Antilles, though decreasing in frequency over time as the apparent result of overexploiting these slow growing species (Newsom and Wing 2004). Woods such as lignum vitae with high specific densities, and/or large quantities of resins have larger calorific values than other woods, and burn for longer and at hotter temperatures. Nevertheless, these are not the sole fuelwoods; they may simply be overrepresented due to the preservation bias existing for denser, charred, and rot-resistant woods such as them (Newsom and Wing 2004, 169). The archaeobotanical diversity is substantial and includes many woods that have numerous other useful cultural properties. The degree to which any of them are reflected on the use wear traces on an edge-ground tool complex will be the condition of whether specific silvicultural techniques were used, i.e. pruning and coppicing to optimise the output of young growth. Newsom and Wing (2004, 109) notes that dry forest woods respond well to this type of treatment, and many identified fuelwoods belong to that community. For the interpretation of use wear, this does seem to be a significant complication, since the entire range of woodworking spectra could therefore represent fuelwood gathering.

Canoe building

Based upon the ethnohistoric evidence there are restricted types of woods that were utilised in the building of canoes. According to Oviedo and Las Casas, most of the larger canoes in the Greater Antilles were made of cedar and *ceyba* trunks, as well as the sacred *mari-a* (Lovén 1935, 411, 419-420). The first is most likely Spanish Cedar (*Cedrela odorata*), the second *Ceiba pentandra*, and the third potentially *Calophyllum brasiliense* (above). Cedar and *ceiba* both are easily worked woods with low specific densities (0.34-0.66, av. 0.38-0.45 respectively 0.22-0.5, av. 0.25-0.35), their light weight providing them good buoyancy (Little and Wadsworth 1964, 242-244, 332-224, 348-350; Zanne *et al.* 2009). It is entirely conceivable that these soft woods give way to wear trace developments that are distinguishable from those in the experimental range. The wear trace characteristics resulting from working galba fall within that range, however, since it is somewhat harder (Section 5.2.1.2). Mahogany is a suggested tree species due to its original dimensions, and the "Stargate" canoe from South San Andros Island in the Bahamas is reportedly made from this material (Callaghan and Schwabe 2001, cited in Fitzpatrick 2013). Other species indicated by Little and Wadsworth (1964, 276-278, 238-240) as utilised in canoe building are sandbox wood (*Hura crepitans*) and tabonuco or gommier (*Dacryodes excelsa*, often reported as *D. hexandra*), the former comparable to the soft woods above and the latter a slightly harder and tough wood at specific density 0.39-0.53. The Kalinago of Dominica commonly use this tree for the manufacture of their canoes. According to (Atwood 1791, 24), they switched from mahogany at the end of the 18th century since these trees would no longer attain the requisite diameters due to overharvesting of the stock.

Felling and working of construction timbers

For house-building materials the record is similarly oriented towards species with long straight trunks, but its species diversity is much broader. Archaeological woods identified as belonging to posts include

Sideroxylon sp. at Heywoods, Barbados (Drewett *et al.* 2000), satinwood (*Zanthoxylum flavum*), cf. black torch (*Erithalis fruticosa*), and cf. bustic (*Dipholis* sp. [synonymous with *S. salicifolium*]) at Golden Rock 1 (Newsom 1992), cf. tachuelo (*Pictetia aculeata*) at Tibes, Puerto Rico (Newsom 2010), and *S. salicifolium* and *S. foetidissimum* at El Cabo (Samson 2010, 170). The excavations at Los Buchillones uncovered mahogany (*Swietenia mahagoni*) and lignum vitae (*Guaiacum* sp.) for the main posts, and for secondary elements also yaití (*Gymnanthes lucida*) and manglesillo (*Bonnetia cubensis*) (Pendergast *et al.* 2002; Carreras Rivery 2009; Jardines Macías *et al.* 2013; Valcárcel Rojas *et al.* 2006). Lignum vitae and wild tamarind (cf. *Acacia* sp.) are common post materials at Tutu, St. Thomas, with marble tree (*Cassine* sp.) and maran (*Croton* sp.) represented by a single post each (Pearsall 2002). At Luján 1, ucar (*Bucida* sp.) was preferentially used, and almendrón (*Pouteria* spp. e.g. *P. multiflora*) occurs at Maisabel (Newsom and Wing 2004, 136, 162).

According to Oviedo, *carbana* trunks were well suited as posts, since they did not decay in their postholes, but the species is not mentioned Lovén (1935, 411); it is, however, not lignum vitae (cf. Pendergast *et al.* 2002). Breton mentions the use of bulletwood or *bálata (Manilkara bidentata*) in the Lesser Antilles in 1647 (in Lammers-Keijsers 2007, 42), for either canoes or houses but presumably the latter as it is an excellent and durable commercial timber still today. Lammers-Keijsers also mentions the potential use of campêche (*Haematoxylum campechianum*), a suitable wood for posts that was introduced from Central America in the Ceramic Age. It is abundantly clear from this overview that there are no specific tree species that are culturally targeted, with only *Syderoxylon* spp. and *Guaiacum* spp. having multiple occurrences. Instead, it stands to reason that this list reflects local availability and access of woods with suitable dimensions, with as governing principles moderate to high hardness and rot resistance. The lightest genera is *Croton* (averaging at 0.4 to 0.5), with the Puerto Rican species of *C. poecilanthus* at a value of 0.6 (Little and Wadsworth 1964; Zanne *et al.* 2009), but all others average either between a specific density of 0.7 to 0.9 or one of 0.8 to 1.0. Clearly, the selection of hard and dense woods that resist decay and insect attacks for constructing dwellings is backed up by the data. Presuming that such generally hard woods were felled and shaped green, this provides a confined range for the interpretation of wear traces from the working of wood.

Carving of portable objects

It would appear apposite to subdivide portable objects into distinct groups, based upon their potential for divergent cultural properties. The first group concerns objects that would need to endure mechanical stresses such as handles and hunting tools. A second group concerns smaller architectural elements such as planks and rafters for which durability, weathering characteristics, and suppleness are important. A third group would include objects that probably had no requirements in mechanical properties for functioning such as bowls and sculptured idols. Some of the latter may have necessitated particular trees in relation to potential sacredness or particular relational qualities, more so than other object types. One example would be if the arrestment described in Ramón Pané concerns woods from particular species, specifically known to (sometimes) act as a disguise for entities of a different nature (Pané 1999, 26).

As it turns out, however, the archaeobotanical record shows no distinctions between any of these. *Guaiacum* sp. is incredibly common for all kinds of artefacts from both groups of objects, though far from the only wood in use. It is quite possible that its superior conservation qualities are somewhat responsible for this situation, though the contextual derivation of the other identified woods includes the same range of waterlogged sites and dry aired caves. For functional and sculptural portable objects, the set of woods from Los Buchillones includes – besides a majority of *Guaiacum* sp. – *Guibourtia hymenaefolia* (as the *Pseudocopaiva hymeneaefolia* synonym), *Conocarpus erectus*, *Pera bumeliaefolia, Belairia* sp., and *Diospyros* sp., used frequently for the manufacture of both, notably including hafts (Jardines Macías *et al.* 2013; 2015). Amongst carved stools (*duhos*) from the Bahamas *Cordia* sp. and *Carapa* sp. were also regularly utilised (Ostapkowicz 2015), and other instances of identified objects that were not made out of *Guaiacum* sp. include a *Cuban* baton from *Caesalpinia* sp. cf. *vesicaria* and a Jamaican zemi from *Swietenia sp.* (Ostapkowicz *et al.* 2012) as well as a Dominican cohoba stand from *Carapa* sp. (Ostapkowicz *et al.* 2013) and paddles from various islands in *Swietenia* sp. and *Carapa* sp. (Ostapkowicz *et al.* 2012) as well as *Zanthoxylum* sp. (Newsom and Wing 2004, 51-52, 183). The paddle of purported cedar is probably the aforementioned *Swietenia* sp. specimen, as the provenance is identical. The Kalinago of Dominica formerly used *Pimenta racemosa* for war clubs, and thereafter for other tools and small posts (Hodge and Taylor 1957). For architectural elements specifically, whether as parts of structures or as canoe sideboards (cf. Callaghan 2013), there is very little archaeobotanical evidence. Relatively softer woods such as white cedar (*Tabebuia heterophylla pallida*) and trumpet wood (*Cecropia schreberiana*) are suggested to have useful purposes in that range, however (Lammers-Keijsers 2007, 42-43).

The main thing to note in this selection is that it is rather broad, but that there appear no truly soft trees (below 0.4) or very hard woods (above 1.0) with the exception of *Guaiacum* sp. This is the case both for the whole, as well as for specific object groups. The alternative woods utilised in the fashioning of *duhos*, for instance, rank between specific densities 0.4 and 0.7 within their genus (following Zanne *et al.* 2009 and excluding measurements from beyond the Neotropics, data on Caribbean species being poor). The selections also clearly reflect ecological differences, with many of the woods from Los Buchillones not (yet) identified elsewhere in the Caribbean and not represented in the Global Wood Density Database. Here, genus ranges are between 0.45 and 1.2 with most actual woods probably between 0.6 and 1.0, and thus to a degree accounted for by the range of experimentally worked woods. The specific densities of *Caesalpinia* spp. range dominantly between 0.9 and 1.2, and thus represents the use of another harder wood in the paraphernalia it was used for.

Appendix 3

Tabulation of edge-ground macro-lithic assemblages

Measurements are given in millimetres. The particular wear trace signature matched by exp. 2550 manufacture and the quartz sand abrasives is coded as 'sand-ground', but obviously represents an equifinal collection of different techniques. The flat, bright, non-invasive polish is coded as 'mineral mirror polish' though the technological recipe remains unknown. Traces from friction with wood are presumed for all fully identified hafting arrangements in the distributions discussed in the associated sections. Other types of wear, such as traces from ligatures, bindings, or technological alterations are noted since their observation remains optional. The wood use wear signatures refer to the experiment mixtures they are likened too, as these at present are not differentiated in their physical properties. Blank fields (e.g. -) indicate no assessment could be made or the field has no relation to the object (such as use wear for established preforms), whereas the absence of a particular kind of biographically expected data will be noted (e.g. absence of grinding for hafted/used celts). In addition, the hafting field records no relevant surfaces or fragmentary relevant surfaces and the use wear field records no edge surface. This serves to better distinguish the various qualities of absence of data as a result of a lack of contact/failure to develop versus the often occurring situation that such wear is located on surfaces now missing from the artefact. Material groups fields marked by an asterisk (*) contain the preliminary groupings made by myself based upon broad similarity with materials identified by specialists.

A3.1 Pearls

Site	Fnr	Type	Material group	Material description	Context	Length	Width	Thickness	Procurement	Early reduction	Abrasive manufacture	Hafting	Use	Deposition	Comments
Pearls	001	Chisel, rectangular symmetric	Metamorphic, high-pressure	Jadeite-bearing, slight foliation, green-black	-	42	15	8	-	-	Coarse grooves. Soft material polish A	Terminal-axial parallel-male	Hard material contact, polish striated. Edge heavily chipped	-	GRD 006
Pearls	002	Petaloid, slight asymmetry	Metamorphic, jadeitite	Dark green	-	75	41	16	-	Flaking, pecking	Inferred prior stage. Soft material polish A	Lateral-transversal parallel-male, embedded, resin. Repecked sides	Woodworking, 'exceeding'. Edge chipped	-	GRD 007
Pearls	003	Petaloid, slight asymmetry	Metamorphic, jadeitite	Pale green	-	76	40	18	Internal defects	Bifacial thinning, pecking	Dry grinding traces, seasoned wood polish	Unsure, possible re-polishing. Rougher sides	Woodworking, experimental range (cf. galba, mahogany), polish striated. Edge heavy rounding, asymmetric distribution	-	GRD 004
Pearls	004	Biconvex, slight asymmetry	Metamorphic, prob. jadeitite	Dark green, banded	-	63	34	18	-	-	Inferred prior stage. Mineral mirror polish	Uneven wood friction, poss. perpendicular-juxtaposed	Woodworking, 'exceeding'. Edge rounded, heavily chipped, strong asymmetric distribution	-	GRD 008
Pearls	005	Biconvex, asymmetry	Sedimentary	Volcanoclastic, banded green	-	62	32	21	-	Flaking (butt)	'Sand-ground' traces, mineral mirror polish	Lateral-transversal parallel-male, embedded	Woodworking, experimental range (cf. waterwood, seagrape, bleary cedar). Symmetric distribution	-	
Pearls	006	Semi-lunar axe, symmetric	Volcanic	Ultramafic (olivine-rich)	-	102	84	18	-	Flaking of roughout. Possible pecking	Dry to 'sand-ground' traces	Unsure, unknown traces, symmetric distribution	Hard material contact, poor development. Edge heavily rounded, chipped	-	
Pearls	007	Plano-convex, asymmetric	Metamorphic, low-grade	Metatuff, grey-brown	-	66	32	14	-	-	Dry to 'sand-ground' traces	Latero-distal, transversal, perpendicular juxtaposed. Resin	Potential pliable-soft material contact, potential resharpening, thus unclear. Polish striated, asymmetric distribution	-	
Pearls	009	Petaloid, asymmetric	Metamorphic, jadeitite	Green	-	98	50	23	Internal defects	Bifacial thinning, burin blow scars, pecking	Inferred prior stage. Wood contact polish	Re-pecked sides, no friction traces	No traces. Edge sharp	-	GRD 002

Pearls	010	Wedge, symmetric	Metamorphic, jadeitite	Green	-	65	33	14	-	Pecking, not erased	Coarse grooves. Wet grinding traces, striated (hard lithic platform)	Resin, no friction traces. Repecked sides	Woodworking, experimental range (cf. bleary cedar), heavily striated. Edge heavily rounded, chipped. Asymmetric distribution	-	GRD 005. Evident craqueler
Pearls	011	Pounded (reworked), symmetric	Metamorphic, high-pressure	Jadeite-bearing, green-black	-	61	43	23	Internal defects	Pecking, not erased	'Sand-ground' traces with polish, mineral mirror polish	Unsure, possible re-polishing. Repecked sides	Reworked (pecking), pounding soft matter, rounding and chipping	-	GRD 011
Pearls	013	Petaloid, symmetric	Metamorphic, jadeitite/ omphacite	Slight foliation, medium-grained	-	83	33	21	-	Pecking, not erased	Inferred prior stage. Soft material polish B	Uneven adhesive, poss. perpendicular-juxtaposed	Woodworking, 'exceeding'. Possibly wood in dry or burnt state. Symmetric distribution	-	GRD 009
Pearls	014	Petaloid-like roughout	Volcanic	Phonolite/ trachyte	-	235	121	33	Alluvial context	Direct bifacial thinning, bipolar lateral intrusive flaking	-	-	-	Following mistakes during production	
Pearls	015	Body flake	Metamorphic, greenschist	Green with white lines, slight schistosity	-	60	37	32	-	-	'Sand-ground' traces with polish	Lateral-transversal parallel-male split	-	Following fragmentation	
Pearls	016	Petaloid butt fragment, symmetric	Metamorphic, greenschist	Green	-	61	45	7	-	-	'Sand-ground' traces, mineral mirror polish	No traces (relevant surface fragmented)	-	Following fragmentation	
Pearls	017	Edge fragment	Plutonic	Dark with white minerals	-	51	52	30	-	-	Coarse dry grinding traces, fine grinding traces, wet grinding traces (quartz arenite)	Edge fragment lacking posterior surface. Rougher sides	Woodworking, usnpecified. Edge heavily chipped	Following fragmentation	

Pearls	018	Petaloid, symmetric	Metamorphic, jadeitite	Pale green, mica-bearing	-	105	52	28	Internal defects	Bifacial thinning	'Sand-ground' traces	Lateral-transversal parallel-male, embedded, resin, bright spots	Woodworking, usnpecified. Edge rounded	-	
Pearls	019	Wedge, symmetric	Volcanic	Ultramafic	-	74	47	11	-	Possible pecking	Coarse grooves, fine grinding traces. Wet grinding traces (hard lithic platform)	No friction traces	Woodworking, experimental range (cf. galba, mahogany). Edge sharp, heavily chipped. Symmetric distribution	-	
Pearls	020	Petaloid, symmetric	Metamorphic, jadeitite	Mottled green	-	100	47	22	Internal defects?	Bifacial thinning, butt flaking, not fully erased	'Sand-ground' traces	Unsure, unknown traces, asymmetric distribution, bright spots? Rougher sides	Woodworking, 'exceeding' and experimental range (cf. waterwood, seagrape bleary cedar). Edge chipped. Strong asymmetric distribution	-	
Pearls	021	Rectangular, symmetric	Metamorphic, jadeitite	Black-green, dark colour	-	154	83	24	-	-	Coarse grooves. Wet grinding traces (quartz arenite)	Lateral-transversal parallel-male, probably split	Woodworking, 'exceeding' on edge, typical elsewhere. Edge heavily rounded, chipped. Symmetric distribution	Following fragmentation?	Evident craqueler
Pearls	022	Petaloid, symmetric	Metamorphic, jadeitite	Green	-	145	60	30	Internal defects	Flaking (butt). Pecking, not erased	'Sand-ground' traces	Latero-distal, transversal, perpendicular juxtaposed. Poss. also lateral-transversal parallel-male split. Resin, rougher sides	Woodworking, typical	-	
Pearls	023	Pebble	Metamorphic, jadeitite	Pale green	-	75	41	16	Alluvial, internal defects?	-	-	-	-	-	

A3.2 El Flaco

Site	Fnr	Type	Material group	Material description	Z-S-s	Layer	Unit	Feature	Length	Width	Thickness	Procurement	Early reduction	Abrasive manufacture	Hafting	Use	Deposition	Other	Comments
El Flaco	0020	Butt fragment	Metamorphic, low-grade	Strong overprint, grey-green	63-64-05	4	77		41	44	17	-	Pecking traces	'Sand-ground' traces with some polish, incomplete grinding, wet stone variant 1a	No traces observed (relevant surface fragmented)	-	Full fragmentation		
El Flaco	0029	Butt fragment	Volcanic, overprinted	Brecchia protolith, grey-green	63-64-84	6	1		42	33	10	-	Not seen	'Sand-ground' traces with some polish	No traces observed (relevant surface fragmented)	-	Full fragmentation		
El Flaco	0083	Edge fragment, preform	Volcanic, overprinted	Degree unknown, greenish	63-74-44	2	6		42	30	16	Rough natural surface, unknown	Step/hinge terminations shape the edge, direct percussion	-	-	-	Production fracture		
El Flaco	0094	Medial-butt fragment	Metamorphic	Possibly garnets	63-74-34	1	7		74	46	23	Alluvial	Expedient. Slight coarse pecking on lateral side	Expedient: none but slight dry grinding traces	Latero-distal, transversal, perpendicular juxtaposed. Traces of bindings and treated resinuous adhesive	-	Medial-edge fragmentation from use impact		
El Flaco	0102	Edge-medial fragment	Metamorphic, low-grade	Plutonic protolith, green	63-75-60	1-3	2		59	47	29	-	-	Dry grinding traces (striated), wet stone variant 1b	Indeterminate traces (relevant surface fragmented)	Woodworking, experimental range (cf. seagrape, bleary cedar). Potential resharpening. Edge sharp, micro-chipping. Asymmetric distribution	Skewed transverse fracture during use		
El Flaco	0113	Butt fragment	Igneous	Dark blue-grey	63-75-40	0	2		40	38	29	-	Flake ripples, overlain by fine pecking traces	Not seen	Male embedded	-	Transverse medial fracture with point of impact on side		
El Flaco	0134	Flake, preform	Metamorphic, low grade	Basaltic protolith, green-grey	63-74-55	3	6		76	33	9	-	Flaking unspec., fine pecking traces	-	-	-	Production fracture		

El Flaco	0179-01	Petaloid	Volcanic, gabbro	Dark blue	63-74-35	5	7		93	49	16	-	Marks from pecking persist	'Sand-ground' traces, wet stone variant 1a, potential interference from contact with wood	Male, probably split	Woodworking, 'exceeding (but cf. dry seagrape)', directional. Symmetry unclear	Edge fully destroyed, fragmentation probably use-related		
El Flaco	0179-02	Butt fragment	Metamorphic, uncertain	Silicious shale? Pale green	63-74-35	5	7		49	25	21	Heavily weathered	Not seen	Incomplete grinding, unknown technique, dull lustre	Traces from friction with wood, distribution unspecified	Probable impact craters on butt, unclear association	Skewed transverse fracture	Granular red mineral residue	
El Flaco	0210	Medial fragment	Plutonic	Dark blue-black	63-64-64	2	10		63	50	29	-	Marks from pecking persist	'Sand-ground' traces, duller range	Probably male embedded, possibly supporting ligatures. Repecked sides	-	Two transverse medial fractures	Residue of uncertain origin	
El Flaco	0223-01	Flake	Plutonic, overprinted	Slight overprint, grey	63-64-74	3	10		45	35	17	Alluvial	Conchoidal flake, scars from direct percussion	Not seen	Indeterminate; see other	-	Fragmentation unsure	Indeterminate friction traces from a pliable material present	
El Flaco	0232	Butt fragment	Metamorphic, high-pressure?	Jadeite-bearing? Very pale green.	63-74-26	2	9		39	24	21	-	Unsure	Unknown abrasive technique/platform, dull lustre	Red-black grainy residue, but association unclear since occurs in sectioned surface. No wear traces observed (relevant surface fragmented).	-	-		Thin-section
El Flaco	0241	Medial fragment	Volcanic tuff, overprinted	Degree unknown, green	63-74-26	4	9		45	45	18	-	Marks from pecking persist	Unsure, possibly 'sand-ground' traces overlain by soft wear, or abrasives. Included as unspecified	No traces observed (relevant surface fragmented)	-	Two transverse medial fractures, points of impact unknown		
El Flaco	0253	Edge-medial unifacial fragment	Metamorphic, greenschist	F-g tuff protolith, lighter green	63-67-74	5	1		79	41	12	-	Not seen	Dry to 'sand-ground' traces	Indeterminate traces (relevant surface fragmented)	Woodworking, experimental range (mahogany). Edge battered dull	Destructive edge removal from use		

El Flaco	0544	Edge fragment	Metamorphic	Lighter green	63-75-10		2		30	35	14	-	Not seen	Dry to 'sand-ground' traces	Indeterminate (rel. surf. absent but treated resin deposits present)	Woodworking, experimental range (cf. fresh seagrape, mahogany). Resharpening (flaking). Edge rounded, chipped. Symmetric distribution	Resharpening impact destroyed edge, followed by transverse medial fracture		
El Flaco	0717	Butt fragment	Igneous, over printed	Dark grey, light overprint, volcanic or f-g plutonic	63-74-17	4	9		41	37	26	-	Flaking unclear, fine pecking traces	'Sand-ground' traces, short duration contact	Parallel male embedded, traces of friction with hard wood	-	Transverse medial fracture, unsure if point of impact	Unspecified blackish residue	
El Flaco	0766	Butt fragment	Metamorphic, greenschist	Tuff protolith, white veined green	63-85-88		12	Split Find	41	35	24	-	Marks from pecking persist	'Sand-ground' traces, duller range	Treated resinuous residue, hafting bright spots, system unspecified	-	Skewed transverse fracture		Thin-section
El Flaco	0772	Medial fragment unifacial	Metamorphic, greenschist	Tuff protolith, white veined green	63-85-99		12		79	31	8	-	Not seen	Dry grinding traces	Single bright spot, system unspecified (relevant surface fragmented)	-	Full fragmentation		Not an edge despite sharp morphology
El Flaco	0798	Medial-butt fragment	Metamorphic, low-grade	Black-grey mottled. Very fine-grained, metatuff?	63-96-00		12	Split Find	67	47	34	-	Flake scars remain, heavy impacts on sides	Dry to 'sand-ground' traces, well developed unspecified wet stone polish	Latero-distal, transversal, perpendicular juxtaposed. Traces from ligatures present, potential blackish residue. Bright spots, flake damage on butt, hammered sides	-	Transverse medial fracture		
El Flaco	0819	Edge flake	Metamorphic, greenschist	Tuff protolith, dark green		0	East of 13		19	31	6	-	Not seen	Wet stone variant 3	No traces observed (relevant surface fragmented)	Woodworking, distinct (glistening, pitted, isolated domed polish). Edge sharp	Use retouch or rejuvenation flake		

El Flaco	0945	Butt-medial fragment, biconvex?	Volcanic, overprinted	Degree unknown, dark blue-black	63-57-94	6	20		55	35	21	-	Fine pecking of facets post-grinding	Coarse grooves. Wood polish, potentially with abrasive	Potentially repecked sides, some grain rounding but no interpretable traces	-	Medial-edge fragmentation from use impact		
El Flaco	1001	Unsure (butt?)	Volcanic	Grey	63-67-40	3	23		24	35	28	Alluvial	Unsure	Not seen	Not interpretable	-	-		Included as blank
El Flaco	1002	Edge-medial fragment	Volcanic	Dark blue-grey	63-66-39	3	23		71	42	23	-	Pecked surface persists	Wet stone variant 2	Male, probably embedded. Sides may have been reworked	Woodworking, 'exceeding (but cf. galba, bleary cedar)'. Symmetric distribution	Edge fully destroyed but unsure if use, transverse medial fracture		
El Flaco	1004	Butt fragment	Undetermined stone		63-67-30		23	67-07	36	31	26	Unsure	Unsure	Unsure	-	-	Transverse medial fracture, possible point of impact		Surface analysis not possible
El Flaco	1056	Other; curved elongate	Volcanic	Schistose overlay, platy	63-93-09		18		117	29	29	-	Coarse pecking marks persist on side	Unknown abrasive technique/platform, dull lustre	-	-	Fragmentation		
El Flaco	1108	Edge-medial fragment	Volcanic	Greyish	63-92-17	7	28		83	58	31	-	Lateral intrusive flaking, pecking of sides	Not ascertainable	Uncertain	Friction polish, indistinct. Symmetric distribution. Edge battered	Transverse medial fracture		
El Flaco	1119	Edge-medial fragment	Volcanic			0	x=1339,41; y=5713,82; z=326,96		58	30	21	-	Not seen	Not analysed, dull lustre	Not analysed	Not analysed	Transverse medial fracture		
El Flaco	1213	Medial fragment unifacial	Volcanic	Blue-grey, alt. carbonate?	63-56-97	Combined	30		21	38	10	-	Not seen	Uncertain	No traces (relevant surface absent)	-	Full fragmentation		Not an edge despite crescent morphology
El Flaco	1215	Medial fragment unifacial	Volcanic, overprinted	Slight overprint, dark blue	63-56-98	Combined	30		38	39	9	-	Not seen	Striated, stone scratches, retains roughness, but uncertain technique	Wood friction overlaying manufacture, a-typical distribution, system unspecified	-	Full fragmentation		

El Flaco	1218	'Wedge'	Volcanic	Blue-grey	63-56-38	Combined	30		63	37	27	-	Fine pecking persists on sides	Dry grinding traces	No traces	Woodworking, typical (cf. mahogany, to weak reticulation). Distributed deep into medial zones. Hammering traces on butt. Slight asymmetric distribution	Edge fully destroyed		
El Flaco	1226-02	Butt fragment	Volcanic	Greyish		0			38	30	27	-	-	-	-	-	Transverse medial fracture with point of impact on side		Not analysed
El Flaco	1233	Edge fragment?	Metamorphic, low-grade	Siliceous shale, grey	63-85-32	Combined	12		49	44	10	-	Not seen	Traces conform to dry grinding, but unclear if comparable	No traces observed (relevant surface fragmented)	Unclear, see other	Fragmentation unsure	Thin rim has retouch, but probably trampled rather than (re)used	
El Flaco	1244	Wedge-like celt	Metamorphic, greenschist	Plutonic protolith, green white veined	63-85-20	Combined	12		54	35	27	-	Fine pecked facets	'Sand-ground' traces, brighter range, with striations	Perpendicular juxtaposed on wood, bright spots, red-black grainy adhesive over repecked sides	Woodworking, experimental range (bleary cedar, galba, to weak reticulation), with striations. Asymmetric distribution	Edge fully destroyed, transverse medial fracture	Heat cracking?	
El Flaco	1250	Edge-medial fragment	Volcanic	Greyish	63-86-20	Combined	12		57	25	16	-	Lateral intrusive flaking	'Sand-ground' traces, brighter range, with grooves	Bright spot streaks, possible traces from friction with wood (relevant surface fragmented)	Soft material contact. Edge sharp, with impact retouch. Symmetric distribution	Skewed transverse fracture during use		
El Flaco	1254	Edge fragment	Volcanic	Greyish	63-67-24	3-5	19		24	26	15	-	Not seen	'Sand-ground' traces, slight contact with wood probable	No traces (relevant surface absent)	Unanalysable (PDSM), sharp and symmetric	Skewed transverse fracture during use		
El Flaco	1258	Butt fragment	Metamorphic, low-grade	F-g volc protolith, green-grey	63-67-23	5-6	30 (sic)		29	27	18	-	Marks from pecking persist	Dry grinding traces, slight inclination towards 'sand-ground' range	Male embedded in wooden handle, presence of grit?	-	Transverse medial fracture		

El Flaco	1677	Flake	Metamorphic	Green, very fine-grained. Metatuff with greenschist overprint?		0	x=1374,694; y=5636,494; z=319,407		48	38	10	-	Not seen	Dry to dull 'sand-ground' traces	Presence of distinct black viscose residue, but traces unclear	-	Fragmentation unsure		
El Flaco	1787	Blunted celt	Metamorphic?	Dark grey-black, fine grained. Possible metasiltstone	63-49-76	3	39		90	46	26	-	Marks from pecking persist	'Sand-ground' traces, wet stone variant 1a?	Traces from contact with a soft to pliable material, red-black stains on distal area, mild flaking of butt. System ultimately unspecified	Holdover wear, wood friction traces unspecified. Reworked facets carry residue	Unsure (intact)	Coarse pecked facets not analysable under high magnification	
El Flaco	1795	Blunted celt	Metamorphic, low-grade	Light grey-green, very fine-grained	63-37-__	0	38	37-35	85	39	26	-	Not seen	Dull scintillation, unspecified	Male embedded, >6cm in handle of unknown material. Treated resinuous residue on distal area, mild flaking of butt	Reworked facets: rounding observable (not analysable under high magnification)	Unsure (intact)	No clear indications if ever a celt, or directly manufactured as blunt percussion tool	
El Flaco	1833	Medial-butt fragment	Metamorphic, low-grade*	Light green, sugary, white vein patina. Very fine-grained. Metatuff or metasiltstone	63-36-87	6	40		124	62	30	-	Thinning scars persist	'Sand-ground' traces, slight striations	Perpendicular juxtaposed attachment. Possible traces of ligatures present, pristine? resinuous residue	-	Medial-edge fragmentation from use impact	Various taphonomic residues, interfering elongated surface flake	
El Flaco	1913	Edge fragment	Volcanic, overprinted	Dark grey basalt with medium-grained phenocrysts, some green minerals	63-55-51	3	44		45	47	26	-	Not seen	Gouged, wet stone variant 3, short duration contact	Probably male, entered as unspecified. Fractured in the haft (relevant surface absent)	Woodworking, distinct (irregular development, from intense cf. experimental range to early development). Potential resharpening, asymmetric distribution	Transverse medial fracture		Morphology is plano-convex in spite of haft interpretation.

El Flaco	1967	Medial fragment	Metamorphic, low-grade*	Green mottled	73-13-13	1	47		30	16	26	-	Not seen	Dry grinding traces, slight inclination towards 'sand-ground' range	No traces observed (relevant surface fragmented)	-	Full fragmentation		
El Flaco	1999	Other; unsure morphology	Metamorphic, high-pressure	Blueschist, blue-pale green	63-65-47	1	45 (sic)		48	22	23	Alluvial	Unsure	Wet stone unspecified contact, mineral mirror polish	No traces observed (relevant surface fragmented)	-	Full fragmentation		Fracture patterns is rectilinear, indicative of bipolar percussion?
El Flaco	2012a	Edge-medial fragment	Metamorphic, low-grade*	Greenschist, light green	63-68-16	2	49	68-01	64	31	19	-	Not sure	Dry or 'sand-ground' traces	No traces (relevant surface absent)	Woodworking, typical (mild development cf. mahogany). Edge destroyed. Symmetry unclear	Skewed transverse fracture during use		
El Flaco	2012b	Butt fragment	Sedimentary	Brownish mudstone	63-68-16	2	49	68-01	17	25	22	Alluvial	Not seen	None	Wood friction, overall indeterminate	-	Fragmentation unclear		
El Flaco	2014	Medial flake	Metamorphic*	Green	63-68-05	2	49		23	12	5	-	Not seen	'Sand-ground' traces	Wood friction, overall indeterminate	-	Full fragmentation		
El Flaco	2039	Edge-medial fragment	Plutonic	Black/white, rel. fine-grained, quartz-poor?	63-68-28	2	49	68-01	41	41	17	-	Lateral intrusive scars persist	Possibly wet stone variant 2?	Male (indeterminate), hafted in wood	Woodworking, experimental range (cf. fresh seagrape). Edge dulled, chipped. Asymmetric distribution	Transverse medial fracture, unclear if point of impact	Slight asymmetry	
El Flaco	2052	Flake	Volcanic, overprinted	Blue-grey, fine-grained	63-68-16	3	49		23	14	7	-	Marks from pecking persist	Dry grinding traces, short duration contact	No traces observed (relevant surface fragmented)	-	Full fragmentation		
El Flaco	2054	Butt fragment	Undetermined stone*	Greyish, possibly carbonaceous	63-68-26	3	49	68-01	52	36	28	-	Marks from pecking persist	Dry grinding traces, but unspec. for potential carbonaceousness	Male embedded, >6cm in wood	-	Transverse medial fracture	Slight asymmetry	
El Flaco	2096	Medial fragment	Metamorphic, low-grade*	Greenschist, green	63-75-__		2	Face F	56	75	25	-	Not interpretable	Not interpretable	Not interpretable	-	Transverse medial fracture and fragmentation		

El Flaco	2098a	Butt fragment	Metamorphic, low-grade*	Greenschist, green		0			66	45	20	-	Flake scars persist	Dry or 'sand-ground' traces with coarse striations	Distal traces from friction with a hard material, but overall indeterminate	-	Medial-edge fragmentation from use impact, followed by transv. medial fracture		
El Flaco	2098b	Butt-medial fragment	Metamorphic*	Green-blackish		0			88	43	25	Alluvial	Lateral intrusive flaking, incomplete, technique unclear. Partial pecking	-	-	-	Fragmentation during production?		
El Flaco	2114	Butt fragment	Metamorphic, jadeitite*	Darker green-blue mottled, sugary, coarse-grained	73-33-79	1	54		30	25	18	-	Marks from pecking persist	'Sand-ground' traces	Pristine? resinuous residue, traces from friction with a pliable-hard material, but, system unspecified	-	Full fragmentation		
El Flaco	2120	Medial fragment	Metamorphic, greenschist*	More schistose, dark green. Very fine-grained	73-35-__	0			70	50	27	-	Possible marks from pecking	Dry or 'sand-ground' traces	Male split or deep embedded, fresh wood?	-	Medial-edge fragmentation from use impact?		
El Flaco	2141	Edge-medial fragment	Volcanic*	Dark grey	63-67-38	1	57		69	49	25	-	Thinning flakes, marks from pecking persist	Densely striated, unspecified	Red and black resins on broken facet, feather-terminated scars (relevant surface fragmented)	Friction polish (not examinable). Edge rounded, chipped. Asymmetric distribution	Skewed transverse medial fracture	Attempted rehafting after breakage?	
El Flaco	2142	Edge-medial fragment, chisel	Undetermined	Grey-bluish, poss. blueschist or basaltic volc.	63-67-19/29		56					-	Fine pecking	Unspecified grinding	Not analysed	Not analysed	Transverse medial fracture	Not analysed	
El Flaco	2143	Edge fragment, chisel?	Metamorphic, high pressure	Blueschist with alterations	63-67-47	1	57		33	37	11	-	Not seen	Possible wood polish	Indeterminate, with possible traces of binding (relevant surface fragmented)	Woodworking, distinct (smooth, non-pitted polish). Edge dulled, chipped. Slightly asymmetric traces	Transverse medial fracture		
El Flaco	2147	Medial fragment	Metamorphic, high pressure	Blueschist with alterations?	63-67-48	1	57		38	31	14	-	Not clear	Not interpretable	Not interpretable (relevant surface fragmented)	-	Full fragmentation		

El Flaco	2151	Edge-medial fragment	Igneous*	Grey-blue	63-67-37	2	57		47	50	27	-	Thinning flakes, marks from pecking persist	Wet stone polish, unspecified	Perpendicular juxtaposed attachment. Possible traces of bindings, residue stain (relevant surface fragmented)	Woodworking, unspecified (early stage). Edge battered dull, symmetric distribution	Transverse medial fracture		
El Flaco	2170	Medial fragment	Metamorphic*	Grey-green	73-34-49	4-5	53	34-01	68	40	19	-	Coarse pecking persists	'Sand-ground' traces, striated sides	Black grainy unspecified residue, isolated woody friction, but system unspecified (relevant surface fragmented)	-	Full fragmentation		
El Flaco	2171	Butt fragment	Metamorphic*	Green, likely greenschist	73-15-__	4	50	15-04	42	37	20	-	Not seen	Dry or 'sand-ground' traces, coarse striations	Treated resin residue, butt supported against wood, either male embedded or juxtaposed with spalls	-	Transverse medial fracture	Asymmetric	
El Flaco	2173	Butt fragment	Undetermined	Dark, fibrous/ glimmering minerals. Might be blueschist	73-15-__	5	50	15-03	60	54	21	-	Pecked surface	Slight dry grinding traces	Perpendicular juxtaposed attachment. Contains treated resinuous residue	-	Full fragmentation	Asymmetric	
El Flaco	2195	Other; unsure morphology	Undetermined	Dark grey-blue/ white acicular minerals. Possibly blueschist	63-67-16	3	43	25-01	58	36	28	-	Coarse pecking	Traces of most likely dry grinding	-	-	Fragmentation unsure		
El Flaco	2219	Edge-medial fragment	Metamorphic, low-grade*	Dark green, likely greenschist	63-67-37	6	67	67-20	59	43	18	-	Not seen	'Sand-ground' traces, good match to brighter range	System unspecified. Black tarry undef. Residue present, clear traces from friction with wood (relevant surface fragmented)	Woodworking, experimental range (smooth, pitted doming cf. invasive galba, waterwood). Attempted resharpening (edge removed)	Transverse medial fracture and longitudinal fracture after failed resharpening	Viscose residue stain near edge	

El Flaco	2231	Edge-medial fragment, chisel	Metamorphic, low-grade*	Greenschist, light green, schistose	63-38-18	1	60		55	26	15	-	Not seen	'Sand-ground' traces, abrasives?	Black tarry undefined residue, overlaying potential traces from the haft	Patination only (edge completely broken away)	Edge fully destroyed, transverse medial fracture, possible point of impact		
El Flaco	2279-01	Medial flake	Metamorphic, low-grade*	Greenschist, light green	63-21-__	5	59	21-10	40	35	4	-	Pecking marks persist	Dry grinding traces, striations	No traces observed (relevant surface fragmentary)	-	Full fragmentation		
El Flaco	2279-02	Petaloid preform	Volcanic, overprinted	Dark grey-green, metabasalt?	63-21-__	5	59	21-10	69	39	10	-	Bifacial thinning, lateral intrusive shaping. Edge bears fine impact crushing, sides hinge terminated scars. All direct percussion	-	-	-	Blank inoperable following thinning accident		
El Flaco	2279-03	Blunt celt	Igneous, overprinted?*	Light overprint probable, dark bluish	63-21-__	5	59	21-10	94	39	27	-	Not seen	Brighter lustred (wet) stone grinding with striae, heavy wood contact polish (exceeding type) with micro-striations	Clear polish from friction with wood, but association indistinguishable from manufacture	Reworked facets, display traces of contact from hard materials	Unsure (reasonably intact)	Application of bright lustre may be part of reworking process -> potential earlier haft absent.	
El Flaco	2279-04	Medial fragment	Metamorphic*	Darker green	63-21-__	5	59	21-10	52	47	17	-	Not seen	Seasoned woodish contact, but attribution unclear – not included	No traces observed (relevant surface fragmentary)	-	Edge fully destroyed, transverse medial fracture		
El Flaco	2279-05	Edge fragment	Volcanic, overprinted	Dark green-grey, metabasalt?	63-21-__	5	59	21-10	48	39	5	-	Not seen	Dry grinding traces?	Indeterminate wear towards medial fracture	Woodworking, 'exceeding' with directionality. Edge dull	Use retouch or rejuvenation flake		
El Flaco	2279-06	Adze	Metamorphic, high-pressure	Dark blue-grey, with white fibrous minerals, blueschist	63-21-__	5	59	21-10	83	43	18	-	Not seen	Dense striations, traces likely from 'sand-ground' contact	Perpendicular juxtaposed, traces from bindings present	Woodworking, 'exceeding (but cf. galba)'. Edge battered dull, asymmetric distribution (sharp bounded patina)	Transverse medial fracture from haft	Mediodistal residue unclear	

El Flaco	2294	Edge-medial fragment	Metamorphic, low-grade*	Dark green greenschist, garnets	63-45-91	8	61	45-11	71	42	25	-	Thinning remnants potentially	Wet stone contact polish, unspecified	Probably perpendicular, traces of binding and wood friction present, but direction and slotting unclear. Friction indicates transversal motion. Repecked sides	Woodworking, well developed to possibly 'exceeding' (glistening, smooth, domed polish), abrasive resharpening, woodworking, unspecified (early stage but cf. bleary cedar). Edge battered dull. Asymmetric distribution	Skewed transverse medial fracture from haft	Asymmetric	
El Flaco	2317-01	Butt-medial fragment	Metamorphic, high-pressure	Blue-green, blueschist with omphacite recrystallization		0			52	33	18	-	Pecking marks persist potentially	Unsure, possibly 'sand-ground' traces overlain by soft wear, or abrasives. Included as unspecified	Black tarry residue, seasoned wood friction in asymmetric distribution	-	-		Thin-sectioned
El Flaco	2318	Edge fragment, tranchet	Metamorphic, low-grade*	Grey-green, very fine-grained. Metatuff or metasiltstone		1	Boring 15		59	61	40	Alluvial	Lateral flaking impacts, tranchet blow	Absent	Indeterminate traces (relevant surface fragmentary)	Indeterminate contact (pitted, rough to smoother polish). Edge chipped	Transverse medial fracture		
El Flaco	2320	Medial fragment	Volcanic*	Dark blue-black	63-45-__	4	63, fill 1		55	34	12	Alluvial	Not seen	Wet stone contact polish, unspecified (could be variant 1, but unsure), striations	No traces observed (relevant surface fragmentary)	-	Full fragmentation		
El Flaco	2343	Edge fragment	Volcanic, overprinted	Brownish, fine-grained. Metabasalt?	63-48-92	2	34		69	53	28	-	Unclear	Dull, but greasy 'sand-ground' traces – unspecified	Repecked sides and possibly face. No traces observed (relevant surface fragmentary)	Modifications present but not further interpreted	Edge fully destroyed, distal fracturing unclear		
El Flaco	999999 (90001)	Edge fragment, preform	Volcanic	Greyish		0			68	84	42	-	Small scars shape blunt edge, direct percussion; minor pecking	-	-	-	Transverse medial fracture with point of impact on side		

El Flaco	999999 (90002)	Edge flake	Metamorphic, greenschist	Tuff protolith, small garnets, pale green white veined		0			36	34	-	-	Not seen	Polish from contact with stone, but overall unclear dull	Indeterminate (relevant surface absent). Presence of treated resinuous residue	Woodworking, experimental range (waterwood, cf. mahogany). Edge sharp	Use retouch or rejuvenation flake		
El Flaco	999999 (90003)	Medial fragment	Metamorphic, greenschist	Tuff or f-g volcanic protolith, dark green white veined		0			62	48	33	-	Flaking present	-	-	-	Two transverse medial fractures	Not analysed	
El Flaco	999999 (no tag b)	Butt fragment	Plutonic, overprinted	Dark/white, some alteration		0			62	73	45	-	Lateral intrusive flaking	-	-	-	Two transverse medial fractures, one point of impact	Not analysed	

A3.3 Playa Grande

Site	Nr	Type	Material group	Material description	Corte	Layer	Length	Width	Thickness	Procurement	Early reduction	Abrasive manufacture	Hafting	Use	Deposition	Other	Comments
Playa Grande	001	Edge fragment	Metamorphic, jadeitite	Uniform pale green	7 (A-H)	0	31	41	13	Heat cracking of surface? Stage unsure	-	Dull, not striated. Weak scintillation with minor 'stony polish' development. Subsequent 'dry' whetting of edge	Polish indicative of plant-like material contact near posterior break Black tarry residue towards medial area	No traces from use. Possible flake remodelling of edge	Fractured along cracked lines, coinciding with potential edge flake remodelling. Also a transverse medial fracture	Some PDSM possible.	Biographical trajectory currently not sensible, unless in a very advanced stage of remodelling (explaining hafting traces and location) with the second-to-last event directly preceding the last (explaining absence of use and both whettings)
Playa Grande	002	Debitage flake	Metamorphic	Not identified, green-yellow cortex	7	6	75	19	32	Alluvial	Impact traces, significant (cortex removal) flake	-	-	-	-	Yellow-brownish anorganic residue present	Sampled for destructive analysis, likely at least HP/ jadeite-bearing (but unconfirmed to me)
Playa Grande	003	Edge-medial fragment	Metamorphic, high-pressure	Grey to bluish, acicular fabric	7 (A-H)	1-2	79	46	17	-	Side shaped by hammering, followed by fine pecking	Mostly dull. Traces from contact with stone, but incomparable (acicular matrix). Inconsistent distribution. Probable abrasive whetting	Unclear (relevant surface fragmentary)	Woodworking, early stage. Probable abrasive whetting. Reworked facets, used for pounding but lack of microwear. Internal crack propagation.	Transverse mediodistal fracture	Starch grain present on edge.	
Playa Grande	004	Medial-distal roughout	Metamorphic, high-pressure	Blue-greyish, foliated	7 (A-H)	1-2	77	42	18	Unclear	Foliation splitting, hammering of sides	-	-	-	Transverse medial fracture		
Playa Grande	005	Edge blank	Metamorphic, jadeitite?	Pale green	7 (A-H)	1-2	53	54	36	Alluvial is probable. Testing of texture (dry grinding traces)	-	-	-	-	Transverse medial fracture (fluid)	Point of impact on edge (percussor?)	Surface provisionally water-worn due to subpar imaging and description
Playa Grande	006	Medial fragment, elongated	Metamorphic, jadeitite?	Pale green, blue streaks, of partial fibrous texture	7 (A-H)	17	48	21	15	-	-	'Sand-ground' traces on sides, brighter range. Faces unclear (interference)	Unclear (relevant surface fragmentary), see Other	-	Two skewed medial fractures	Early stage wood polish (possibly from a haft) overlays faces. Fine-grained black residue on depression	

Playa Grande	007	Medial-distal fragment	Metamorphic, high pressure	Blueschist? Blue, schistose, white mottles, fibrous fabric	7 (A-H)	17	53	31	9	-	Unclear	Dull lustre, asymmetric intensity. Rough, flat, and striated stone polish cf. exp. 2782, but unsure if comparable (acicular matrix)	Unclear, presence of potential bright spots	-	Unclear		Fracture pattern not interpretable, possible haft traces not indicative
Playa Grande	008	Medial-distal fragment	Metamorphic, high pressure	Blue and green mottled	7 (A-H)	17	68	48	11	-	Coarse pecking	Dry grinding traces (jadeite on quartz arenite)	-	-	Unclear		Fracture pattern not interpretable
Playa Grande	009	Edge-medial fragment	Metamorphic, jadeite?	Jadeite-bearing, blue and green mottled	7	3	60	20	15	-	Fine pecking, possibly preceded by coarse	Dull lustre, scratched. Dull, rough, flat, and striated polish from stone contact (cf. exp. 2782), possible presence of scratching particles	No clear traces (relevant surface fragmentary)	Traces from contact with a soft abrasive material (siliceous plant over hide). Edge appears sharp	Longitudinal fracture during use	Apparent asymmetry	
Playa Grande	010	Edge-medial fragment	Metamorphic, jadeitite	Pale green, blue mottle	7	3	66	45	27	Possibly alluvial	Sides shaped by hammering, fine pecking	Possibly limited abrasive contact with stone or abrasives, but unsure	-	Use of edge in percussion	Transverse medial fracture (fluid) with impact point	Both pristine resinous residue and treated resinous residue	Use is probably repurposing
Playa Grande	011	Edge-medial roughout	Metamorphic, jadeitite	Pale green, blue mottle	7	3	59	39	13	-	Direct percussion thinning, bipolar percussion shaping (hammering) of outline	-	-	-	Thinning flake destroyed edge. Subsequent transverse medial fracture		
Playa Grande	012	Polisher preform (reworked?)	Metamorphic, jadeite	Pale green and blue colours	7	3	50	33	11	-	Flaking (bipolar?, foliation splitting?), hammering, then fine pecking	-	-	No clear traces	No indications		
Playa Grande	013	Medial-distal roughout	Metamorphic, jadeite	Pale green and blue colours	7	3	72	44	24	-	Limited thinning and hammering, most is fine pecking	-	No traces (confirmed as roughout)	-	Transverse medial fracture with impact fissuring		
Playa Grande	014	Discoid roughout (other)	Metamorphic	Green, fine-grained	7	3	53	50	12	-	Bipolar percussion shaping sequence	-	-	-	No indications		
Playa Grande	015	Roughout fragment	Metamorphic, jadeite?*	Jadeite-bearing, blue and green mottled	7	3	45	34	12	Alluvial	Flaking unspec. hammering with counter, and pecking	-	-	-	Fractured unclear		
Playa Grande	016	Edge fragment, roughout	Metamorphic, high-pressure*	Blue with slight green mottling	7	3	58	83	25	Alluvial. Testing of texture (Gouged, small 'stony polish' structures)	Probable bipolar hammering of shape and thinning flakes (counter impacts, hinge fissures)	-	-	-	Minor fissure of intended edge. Transverse medial fracture (fluid) with probable impact point		Large-sized celt

Playa Grande	017	Edge fragment	Metamorphic, low-grade?*	Fine-grained, green, schistose	7	3	33	16	5	-	-	Grinding of sharp facets. Dull, deep gouges, 'dry' scintillation of micro-topography	-	Edge rounded. Traces indicate softer contact material cf. plantish, but unclear	Probable use retouch flake		
Playa Grande	018	Edge flake	Metamorphic, low-grade*	Greenschist of darker green	7	3	22	32	6	-	Heavy/coarse pecking	'Sand-ground' traces, brighter range. Incomplete coverage, deep gouges	-	Woodworking, distinctive (well developed). Edge battered dull, chipped.	Use retouch or rejuvenation flake		
Playa Grande	019	Medial-distal fragment	Metamorphic, low-grade*	Greenschist	7	3	105	58	32	-	Bifacial thinning, shaped through hammering, pecking	Intermediate lustre, technique unspecified. Bright scintillation mixed with rough, dull, greasy? 'stony polish', topography striated	Asymmetric, deep attachment, wood friction versus unclear with resin-like residue	Edge flaked out to both sides, probable rejuvenation. Possible weak use traces persist	Rejuvenation invasive? One side has been spalled thereafter		Side not observable under high magnification working distance.
Playa Grande	020	Medial fragment	Metamorphic*	Dark blue to pale grey	7	3	49	38	14	-	Unclear	Intermediate lustre, technique unspecified. Rough, dull, greasy? 'stony polish', topography striated	Traces of unclear wear, spatially suggestive	-	Fractured rectilinear unclear	Has impact marks on surface surrounded by pecking, below the level of grinding	
Playa Grande	021	Edge fragment	Metamorphic, low-grade*	Greenschist	7	3	22	49	16	-	-	'Sand-ground' traces, duller range, striations	Unclear	Woodworking, unspecified (blade zone). Edge light to medium dulling, no traces	Slanted medial break (fluid) behind edge	Transverse oriented cracks on both edges	
Playa Grande	022	Edge-medial roughout	Undetermined*	Volcanic or metamorphic	7	3	78	62	33	Secondary context?	Possible bifacial thinning, shaping through hammering, coarse pecking	-	-	-	Edge shaping mishap, transverse medial fracture (fluid) with possible impact point		
Playa Grande	023	Medial-distal fragment	Metamorphic, low-grade*	Greenschist of darker green	7	3	68	35	19	-	Fine pecking	'Sand-ground' traces, unspecified with higher relief. Short-term abrasion of facets	Asymmetric, directional friction from insertion but contact type unclear	-	Skewed medial break (use related)		
Playa Grande	024	Edge-medial roughout	Undetermined*	Volcanic or metamorphic	7	3	79	67	26	Secondary context	Coarse pecking, flaking/ shaping through hammering	-	-	-	Skewed medial unclear fracture		

Playa Grande	025	Adze	Metamorphic, high-pressure?*	Blueschist? Blue, schistose, fibrous fabric	7	3	72	32	22	-	Bifacial thinning, fine pecking	Absent	Latero-distal, transversal, perpendicular, juxtaposed. Bindings, in wooden rest	Edge destroyed	Damaged use		
Playa Grande	026	Medial fragment	Undetermined*	Ranges from black to grey and green	7	3	40	44	25	-	Fine pecking	Grinding contact against stone (unspecified)	No clear traces (relevant surface fragmentary)	-	Two transverse medial fractures (fluid both, one possible impact point)		
Playa Grande	027	Medial-distal fragment	Metamorphic, high-pressure*	Jadeite bearing	7	3	59	41	23	-	Hammering to coarse pecking, some fine pecking	Absent	Asymmetric, flat ventral face displays traces of exceeding wood friction and unknown residue (pristine resin?)	-	Transverse medial fracture		
Playa Grande	028	Edge-medial fragment	Metamorphic, high-pressure*	Jadeite bearing, blue and pale green mottle	7	3	82	53	27	-	-	Dull, striated sides. Weak scintillation with 'stony polish' development	Faces and side display well developed polish from soft plantish contact, other side displays traces from strong wood friction	Traces from mildly abrasive, soft-pliable contact material. Edge battered dull, catastrophic impact fracture	Edge fractured in use. Then transverse medial fracture with point of impact	Morphology symmetric	
Playa Grande	029	Chisel	Metamorphic, high-pressure*	Jadeite bearing, green-blue mottle	7	3	56	23	11	-	Hammering of sides, fine pecking	'Sand-ground' traces, typical	Documentation unclear	Traces from abrasive, soft-pliable contact material. Edge sharp besides a blunted facet	No indications		
Playa Grande	030	Medial-distal fragment	Metamorphic, high-pressure*	Green and blue minerals in matrix	5	1	41	29	17	-	Coarse pecking	Bright lustre, polish, dense striations: wet grinding traces (cf. quartz arenite). Scant development	Asymmetric, wood-like traces of friction and treated resinous compound dorsally, traces from abrasive plantish contact ventrally	-	Oblique medial fracture	Butt has schist-derived step fracture, possibly from shaping through hammering	All hafting indications are at low confidence individually
Playa Grande	031	Medial fragment	Undetermined*	Grey-green, fine-grained	5	1	54	32	33	-	-	Wet grinding traces (unspecified), poor levelling	Wood friction traces on one face	-	Fragmentation rectilinear		

Playa Grande	032	Medial-distal fragment	Volcanic	Black-grey, probably a basalt	5	1	51	26	19	-	Bifacial thinning, fine pecking	Absent	Unclear friction traces on faces	-	Medial fragmentation use-related		
Playa Grande	033	Edge-medial fragment	Undetermined*	Blueschist or volcanic	5	1	71	52	14	-	Unclear	Wet stone variant 1a, moderately level, striated	No traces (relevant surface fragmentary)	Edge battered and fractured. Use wear present, but not interpretable	Use-related edge fracturing, medial fragmentation		
Playa Grande	034	Edge-medial roughout	Metamorphic, high-pressure*	Jadeite bearing, green-blue mottle	5	1	64	41	23	-	Shaped through direct flaking (edge) and hammering (sides), fine pecking	-	-	-	Transverse medial fracture with possible impact point		
Playa Grande	035	Edge fragment	Volcanic*	Grey-black, fine-grained, possibly a basalt	5	1	41	43	15	-	Shaped through direct flaking and thinning, coarse pecking, fine pecking	Intermediate lustre, one face only. Possibly abraded on hard coarse-grained sandstone, heavily striated (cf. exp. 2515-A)	-	Edge sharp but has obtuse blunting. Thin strip of polish indicates plant materials. Abrasively resharpened	Use retouch, transverse medial break with point of impact		
Playa Grande	036	Medial fragment	Metamorphic, high-pressure*	Blueschist with alterations, characteristic blue /white pattern	5	1	50	51	15	-	Unclear, foliation splitting?	Technique unclear	No clear traces	-	Two transverse medial fractures, one fluid with point of impact		Rock type responds poorly to metallographic analysis
Playa Grande	037	Complete celt, heavily damaged	Unsure	Grey-green colour, fossils?	5	1	87	43	17	-	Hammering into shape	Heavily striated, dry grinding traces. Facets present	Some residue deposits, but no clear wear	Woodworking, experimental range (rough, invasive polish cf. green seagrape). Edge completely destroyed	Edge/face shattered on impact, second impact made on side		
Playa Grande	038	Edge fragment	Metamorphic, low-grade*	Greenschist	5	1	32	54	21	-	-	Wet grinding traces (quartz arenite, ca. 45-75 minutes)	Male slotting (wood friction on sides)?	Traces from soft contact material, distinctive (possibly animal)	Transverse medial fracture (fluid), points of impact	Reworked by blunt pecking of edge, but no traces of wear	
Playa Grande	040	Adze	Metamorphic, high-pressure*	Jadeite bearing, green-blue colours	5	1	51	26	12	-	Invasive flaking	Bright lustre. Cf. wet stone polish variant 1a at far exceeding intensity	Traces of binding and treated resin on the sides, bright spots? on dorsal face; likely asymmetric juxtaposed	No clear traces. Edge blunted with 'sand-ground' technique	No indications		

Playa Grande	042	Elongated fragment	Metamorphic, high-pressure*	Blue, green, and accessory minerals	5	1	83	18	15	Testing of edge (no signature)	Medium pecking, flaking longitudinal axis	-	-	Unclear	No indications	Underdeveloped friction traces from softer materials occur around the proximal half	
Playa Grande	043	Medial flake	Metamorphic*	Dark green to brown	5	1	21	27	5	-	-	Technique unclear	Traces from friction with seasoned wood	-	Fracturing flake		
Playa Grande	044	Edge fragment, roughout	Metamorphic, high-pressure*	Green-blue colours, jadeite bearing	5	1	51	76	7	Probably alluvial, testing (dull scintillation, gouged, some polishes)	Shaped through flaking or hammering, possibly bipolar	-	-	-	Transverse medial fracture (fluid), impact point unclear	Few other smoothened patches on the blade, with softer polishes – significance unclear	Large-sized celt
Playa Grande	045	Medial flake	Undetermined*	Black-grey-blue and fairly fine-grained, could be volcanic or possibly blueschist	5	1	55	25	5	-	Coarse pecking, then removed as flake product	-	-	-	Debitage	No actual reason to assume a mishap over intended debitage	
Playa Grande	046	Medial flake	Metamorphic, low-grade*	Dark green-blackish	5	1	37	38	5	-	-	'Sand-ground' traces, unspecified	Traces from friction with seasoned wood	-	Fracturing flake		
Playa Grande	047	Core?	Metamorphic, jadeite*	Pale green	5	1	26	19	12	-	Pecking, rectilinear breaking (bipolar percussion?)	-	-	-	No indications	Treated resin present to fasten lower circumference	Most likely a core for a small object, seems unrelated to debitage from celt production
Playa Grande	048	Uncertain	Metamorphic, jadeite*	Pale green, sugary; some blue	5	1	78	38	26	Unclear	Flaking unclear, pecking possible	-	-	-	Unsure	Presence of small treated resin deposits	Biography largely not interpretable
Playa Grande	049	Medial flake	Metamorphic*	Various green minerals	5	1	32	22	5	-	Hammering/coarse pecking	Dull, technique unclear: gouged, little trace signature, possibly of short duration	Overlaying friction, including on the pecked area	-	Fracturing flake	Presence of treated resinuous residue in hafting zone	
Playa Grande	050	Blank	Metamorphic, jadeite*	Pale green, a hint of blue	7	1	70	29	26	Alluvial, testing (dry grinding traces, striations)	Partial pecking, direct flaking on the long axis	-	-	-	Apparent flaking mishap		
Playa Grande	051	Edge-medial fragment	Metamorphic, jadeite*	Pale green, a hint of blue and mica	7	1	43	15	17	-	Unclear start, fine pecking	Bevel only. 'Sand-ground' traces, unspecified	-	Woodworking, early stage. Edge sharp	Transverse medial break; edge scarred	A dense streak of treated resinuous residue is present	Strong craqueler near edge scar and in other areas, possibly burnt

Playa Grande	052	Edge-medial roughout	Metamorphic, jadeite*	Pale green, a hint of blue and mica	7	1	53	52	18	-	Bifacial thinning (bipolar?) and hammering of sides (coarse pecks, ridges); flaking along long axis of edge	-	-	-	Severe production mishap, followed by transverse medial fracture (fluid) with point of impact		Glimmer minerals were confused for PDSM wear (or contact while resting)
Playa Grande	053	Celt blank	Metamorphic, jadeite*	Pale green, acicular/fibrous minerals	7	1	97	46	31	Alluvial	Shaping and cortex removal including by bipolar percussion	-	-	-	Flaking mishap		
Playa Grande	054	Celt blank	Metamorphic, jadeite*	Pale green, a hint of blue	7	1	75	39	29	Alluvial	Shaping of edge by direct percussion longitudinal axis	-	-	-	Transverse distal fracture (fluid), possible point of impact		No clear signs of flaking mishaps present
Playa Grande	055	Edge-medial fragment	Metamorphic, low-grade*	Greenschist with darker (unaltered?) veins	7	1	69	37	12	-	-	Striated, dry to 'sand-ground' traces	-	Used, contact unclear. Edge sharp but chipped	Fragmentation unclear		
Playa Grande	056	Medial fragment	Metamorphic*	Dark green, lithology unclear	7	1	78	47	14	-	Flaking longitudinal axis, coarse pecking	-	-	-	Fragmentation unclear	Some abrasive stony contact noted, but no technical activity seen	Either production related fragmentation all, or an invasive flake and medial blow
Playa Grande	057	Axe	Metamorphic, high-pressure*	Blueschist, fairly typical, some green present	7	1	84	34	14	-	Hammering scars remain	Traces from contact with stone, but incomparable (acicular matrix)	Male embedded, likely perpendicular. Use traces symmetric. Strong friction, prop is possible	Woodworking, experimental range	Skewed edge fracture (use)		
Playa Grande	058	Edge flake	Metamorphic, low-grade*	Greenschist, typical	7	1	52	30	8	-	-	'Sand-ground' traces, dull range, striated	-	Woodworking, unclear. Few small domes, largely rough texture and scintillation. Seasoned wood contact? Extensive development	Use flake OR rejuvenation debitage, unclear		Dimensions and use wear extent suggest large-sized celt
Playa Grande	059	Medial fragment	Metamorphic, high-pressure*	Blueschist with alterations	7	1	54	42	15	-	Hammering of sides, otherwise unclear	Wet grinding traces, unclear	Asymmetric distribution of traces. Friction contact with wood, early stage, opposed by contact with a soft abrasive material	-	Two transverse medial fractures		

Playa Grande	060	Edge-medial fragment	Metamorphic, high-pressure?*	Blue-blackish, schistose, acicular minerals	7	1	53	45	7	-	Hammering of sides, otherwise unclear	Facets around the edge only, striated. Technique unclear, possibly inefficient	Traces present, but relation unsure	Woodworking, 'exceeding'. Smooth/flat, bright, and interlinked polishes with no pitting and barely invasive. Patination visible. Edge mostly sharp, some nicks	Transverse medial fracture		
Playa Grande	061	Medial-distal blank fragment	Metamorphic, high-pressure*	Jadeite bearing, green-blue colours	7	1	65	42	30	Alluvial	Direct flaking (cortex removal?), possibly limited pecking	-	-	-	Transverse medial fracture (fluid)	Strong traces of wood friction on one side, presence of adhesive residues; fastening or wooden anvil? unclear	
Playa Grande	062	Distal fragment	Undetermined*	Dark grey with white crystal mottle	7	1	59	55	30	-	Thinning scars, hammering of sides	Striated, dry to 'sand-ground' traces	Friction spots, traces unclear	-	Transverse medial fracture with point of impact		
Playa Grande	063	Edge fragment	Metamorphic, low-grade*	Greenschist typical, with large garnets	7	1	61	68	16	-	-	'Sand-ground' traces, typical, heavily striated	-	Woodworking, distinctive (well developed) on one bevel. Subsequent contact with softer/fresher material on other bevel. Edge battered dull	Originally fractured, if reworked then no indications for later discard	Reworked through hammering a semi-abrupt backed edge. Use uncertain, though note asymmetric wear.	Large-sized celt fragment.
Playa Grande	064	Medial fragment	Metamorphic, low-grade*	Greenschist, greyish-green	7	1	73	54	30	-	Thinning scar, pecking	Dull lustre. Weak scintillation with rough polish, striated on sides	Wood friction indicates male split, black tarry residues	-	Two transverse medial fractures, one haft split other unknown		
Playa Grande	065	Edge-medial fragment	Metamorphic, low-grade*	Green-blackish rock, fine-grained	7	1	52	36	28	-	-	Dry to 'sand-ground' traces, higher relief	Distal wood friction present	Woodworking, unspecified (small, rough, and reticulating polish structures). Edge dulled	Rectilinear fracturing	Strong craqueler present	
Playa Grande	066	Edge blank	Metamorphic, jadeitite*	Very pale green	7	1	54	62	21	Alluvial	Cortex flaking	-	-	-	Flaking mishap, transverse medial fracture		

Playa Grande	067	Edge fragment	Metamorphic, high-pressure?*	Dark green to blue, sugary	7 (A-H)	1-2	21	42	13	-	Unclear, fine pecking	Dull, rough, flat, and striated polish from stone contact (cf. exp. 2782)	-	Wear traces from soft material (invasive, greasy, rough, non-abrasive). Edge sharp, sinuous	Transverse 'medial' fracture		
Playa Grande	068	Edge fragment	Metamorphic, high-pressure?*	Blue-blackish, schistose, acicular minerals	7 (A-H)	1-2	49	39	12	-	Unclear	Dull to diffuse. Traces from contact with stone (rough polish), but unspecified	-	Woodworking, unspecified. Edge partially destroyed	Rectilinear fracture, use related?	Non-broken edge pecked blunt	
Playa Grande	069	Medial-distal roughout	Metamorphic, high-pressure*	Very pale green to blue, schistose appearance	7 (A-H)	1-2	82	47	12	-	Unclear, foliation splitting? Hammering of sides	Wet stone grinding, unspecified, short duration of contact	-	-	Transverse medial fracture		
Playa Grande	070	Distal fragment	Metamorphic, high-pressure*	Dark-green minerals with bands/veins of blue and white minerals. Probably omphacitic	7 (A-H)	1-2	34	27	19	-	-	Wet stone grinding (quartz arenite, high intensity). Sides of lower intensity	Possible bright spots	-	Transverse medial fracture		Square-ish conical outline
Playa Grande	072	Medial-distal roughout	Metamorphic, high-pressure*	Jadeite-bearing, with glaucophane vein	7 (A-H)	1-2	68	45	28	-	Hammering of sides, coarse pecking; some longitudinal thinning	-	-	-	Transverse medial fracture with point of impact		
Playa Grande	073	Medial-distal fragment	Metamorphic, high-pressure*	Blueschist with alterations	7 (A-H)	1-2	53	36	18	-	Hammering of sides, coarse pecking	Traces from contact with stone, but unspecified; short duration, heavy striations	Traces of one or more friction contact types	-	Transverse medial fracture (haft break?)		
Playa Grande	074	Blank	Metamorphic, high-pressure*	Blueschist with alterations	7 (A-H)	1-2	77	38	15	Alluvial	Direct flaking, longitudinal thinning and cortex removal	-	-	-	No indications		Possibly an old thinning flake of a large sized core
Playa Grande	075	Edge roughout	Metamorphic, jadeitite*	Pale green	7 (A-H)	1-2	53	58	37	Alluvial	Shaped through hammering (sides and edge)	-	-	-	Production mishap		
Playa Grande	076	Celt fragment	Metamorphic, high-pressure*	Blueschist with alterations	7 (A-H)	1-2	64	42	10	-	-	Dull scintillation, some 'stony polish' with striations	Friction traces on faces	Wear traces present, unspecified contact. Edge rounded	No indications		
Playa Grande	077	Edge fragment, blank	Metamorphic*	Grey-bluish colour	7 (A-H)	1-2	39	53	30	Alluvial	Sides hammered, including cortex flaking	-	-	-	Transverse medial fracture with potential impact point		

Playa Grande	078	Medial fragment	Metamorphic, low-grade*	Green-blackish greenschist	7 (A-H)	1-2	33	50	19	-	-	Dry to 'sand-ground', unspecified	Unspecified traces, asymmetric in intensity. Pecking of sides	-	Curvilinear fracturing	Craqueler also present, burnt?	
Playa Grande	079	Medial fragment	Sedimentary?*	Carbonaceous? Beige	7 (A-H)	1-2	29	45	9	-	Pecking	Traces from contact with stone (dull scintillation, bands of polish)	-	-	Fragmentation unclear		
Playa Grande	080	Medial fragment	Metamorphic, low-grade*	Dark green, probable greenschist	7 (A-H)	1-2	52	62	28	-	-	'Sand-ground' traces, brighter range	Friction contact apparent on sides	-	Two transverse medial fractures, unclear cause		Possibly large-sized celt
Playa Grande	081	Medial fragment	Undetermined*	Probably volcanic, grey-black groundmass	7 (A-H)	1-2	37	23	20	-	Coarse pecking	Dull scintillation, striations on side, probably short duration (dry to 'sand-ground', unspecified)	Probably male, wood friction gloss on faces and more intense on side	-	Fragmentation unclear		
Playa Grande	082	Edge-medial fragment	Sedimentary*	Carbonaceous? sediment	7 (A-H)	1-2	46	24	15	-	Unclear	Traces from contact with stone, unspecified	-	Traces present, appear as pliable or hard material contact. Striated. Edge battered	Skewed edge fracture (use)		Rectilinear morphology, likely a chisel
Playa Grande	083	Edge fragment	Undetermined*	Grey-green banded, possibly a volcanoclastic sediment	7 (A-H)	1-2	40	37	24	-	Possible thinning scar persists	Dull, rough, flat, and striated polish from stone contact (cf. exp. 2782)	Unclear	Woodworking, 'distinct' extremely well developed. Edge battered dull	Skewed edge fracture (use) and transverse medial break		
Playa Grande	084	Edge roughout	Metamorphic*	Possibly jadeite, green sugary	7 (A-H)	1-2	38	43	6	Debitage flake from earlier sequence	Shaped through flaking and hammering of sides, pecking near edge	Wet grinding traces, unclear. Short duration, small edge facets	-	Not used	Transverse medial break unclear		
Playa Grande	085	Edge fragment	Metamorphic, low-grade*	Greenschist, typical	7 (A-H)	1-2	41	49	17	-	Thinning scars persist	Well levelled, dry ground near edge, further dull scintillation with fine striations	-	Edge battered dull, use retouch, but no traces of wear	Transverse medial break (fluid) with point of impact	Resharpening could explain lack of wear, but there is no good evidence for this.	
Playa Grande	086	Medial fragment	Metamorphic, high-pressure*	Evenly mottled green and blue minerals	7 (A-H)	1-2	65	43	16	-	Hammering/pecking of sides, fine pecking	Well levelled, dull scintillation (dry to 'sand-ground', unspecified)	Faces and side display well developed polish from soft plantish contact, other side displays scintillation from possible wood contact, and unspecified residue	Edge completely destroyed	Transverse mediodistal break (fluid)		

Playa Grande	087	Edge-medial fragment	Metamorphic, high-pressure*	Jadeite-bearing, pale green	7 (A-H)	1-2	59	33	15	Alluvial	Cortex removal flakes, possibly coarse pecking	Traces from contact with stone on edge, dull technique unspecified	Unclear	Unsure	Distal fracturing (production?)	Unclear friction polishes present on several surfaces, including the edge	
Playa Grande	088	Petaloid roughout	Metamorphic, high-pressure*	Dark blue to black schist with glaucophanes and some micas	7 (A-H)	1-2	98	49	21	-	Shaped through hammering of sides, splitting of schistose layers, and pecking of faces	-	-	-	Production fracture along schistose layering		
Playa Grande	089	Edge-medial fragment	Metamorphic, jadeitite*	Pale green	7 (A-H)	1-2	44	29	15	Alluvial	Unclear	Traces from contact with stone on bevel, dull technique unspecified	Friction traces present in medial zone, but poorly characterised	Traces indicates wood (early stage) to a softer contact material. Edge sharp, but retouched	Distal fracture along transverse plane	Significant cracking present	
Playa Grande	090	Edge-medial roughout	Metamorphic, high-pressure*	Blueschist, typical	7 (A-H)	1-2	77	41	24	-	Flaking indet., hammering of sides, fine pecking	-	-	-	Transverse medial fracture with possible point of impact	Light friction polishes on dorsal surface, indicate resting during pecking of ventral side?	
Playa Grande	091	Edge-medial roughout?	Metamorphic, jadeitite*	Pale green	7 (A-H)	1-2	58	17	19	Alluvial, tested (dry grinding traces [match with exp. 3797, jadeitite])	Imperfect pecking	-	-	-	Skewed medial fracture		
Playa Grande	092	Edge fragment	Metamorphic, low-grade*	Greenschist, darker green, garnets	7 (A-H)	1-2	65	51	25	-	-	Wet grinding traces, unspecified	-	Woodworking, below/ experimental range (rough polish, little doming). Edge sharp	Rectilinear fracture (haft break)		
Playa Grande	093	Edge-medial fragment	Metamorphic, high-pressure*	Blue acicular minerals with presence of green	7 (A-H)	1-2	50	49	15	-	Hammering of sides, fine pecking	Wet grinding traces, heavy striations, but incomparable (acicular matrix)	No clear traces (relevant surface fragmentary)	Woodworking, experimental range (rough, bright polish with little doming). Edge battered, retouched	Transverse medial fracture		
Playa Grande	094	Blunt celt	Metamorphic*	Shades of lighter green, schistose	7 (A-H)	1-2	33	53	20	-	Hammering/coarse pecking of sides	Wet grinding traces (quartz arenite)	Unsure, impact rounding of distal end	Unsure	No indications		
Playa Grande	095	Edge-medial blank	Metamorphic, jadeitite*	Pale green	7 (A-H)	1-2	69	48	15	Alluvial	Flake thinning unclear, limited hammering and coarse pecking of sides	-	-	-	Production mishap, followed by transverse medial fracture with point of impact		

Playa Grande	096	Edge preform	Undetermined*	Beige-green	7 (A-H)	1-2	30	27	20	-	Fine pecking	-	-	-	Fragmentation unclear, in production		
Playa Grande	097	Medial-distal fragment	Undetermined*	Blueschist or volcanic	7 (A-H)	1-2	67	46	18	-	Hammering of sides	Wet grinding traces, striated polish, dense macro-striations (otherwise unspecified	Faces display traces from friction with wood, sides from plant bindings. Pecking of sides	More intense wood friction directly behind fracture, original use extent unclear	Transverse medial fracture (haft break?)		
Playa Grande	098	Distal fragment	Undetermined*	Lighter green, carbonaceous?	7 (A-H)	1-2	35	40	27	-	-	Traces from contact with stone, unspecified	Asymmetric traces of binding and wood friction	-	Haft fracture (oblique)	Residue present, looks like treated resin adhesive	
Playa Grande	099	Edge fragment	Sedimentary*	Carbonaceous? Pale brown	7 (A-H)	1-2	35	57	13	-	Flaking? Light pecking	Dry to 'sand-ground' traces, unspecified	-	Traces from contact with soft material, developed. Edge sharp	Transverse medial break unclear		
Playa Grande	100	Medial-distal fragment	Metamorphic*	Green-grey schist	7 (A-H)	1-2	83	45	17	-	Thinning scars persist	Meagre scintillation, high relief, striated, ground dry using abrasives?	Traces present but not well developed. Black tarry droplet residue	-	Haft fracture (oblique)		
Playa Grande	101	Edge roughout	Metamorphic, high-pressure*	Jadeite-bearing, pale green	7 (A-H)	1-2	70	62	30	Alluvial, testing of bevel (dry grinding traces)	Hammering of sides, limited pecking	-	-	No traces	Transverse medial fracture with possible point of impact	Treated resinuous compound present near the fracture	
Playa Grande	102	Medial-distal fragment	Undetermined*	Pale green-beige rock, fine-grained	7 (A-H)	1-2	57	32	9	-	Thinning scar persists	Dry grinding traces	No clear traces (relevant surface fragmentary)	-	Haft fracture (oblique)		
Playa Grande	103	Medial-distal fragment	Metamorphic, high-pressure*	Dark blue to black schist with glaucophanes and some micas	7 (A-H)	1-2	64	35	14	-	Flaking/foliation splitting scars, hammering impacts on sides	Absent	Male slotting, embedded; seasoned wooden haft	-	Transverse medial fracture (haft break?)		
Playa Grande	104	Wedge blank	Metamorphic, high-pressure*	Jadeite-bearing, pale green with blue	7 (A-H)	1-2	53	28	20	Alluvial	Very limited shaping	-	-	-	Production flaw due to craqueler		
Playa Grande	105	Edge-medial preform	Metamorphic?*	Dark blue to black with white mottle, possible blueschist with alterations	7 (A-H)	1-2	50	36	18	-	Hammering of sides, fine pecking	Wet stone variant 4, bevel and distal zone only	No traces (relevant surface fragmentary)	Edge unfinished, no traces	Transverse medial fracture		
Playa Grande	106	Medial fragment	Metamorphic, low-grade*	Typical greenschist	7 (A-H)	1-2	30	20	16	-	-	Wet grinding traces, unspecified, dense striations	No traces (relevant surface fragmentary)	Possible re-use	Two medial fractures, one unclear		

Playa Grande	107	Edge-medial fragment	Metamorphic, high-pressure*	Glaucophane matrix, with green minerals present	7 (A-H)	1-2	41	18	10	-	Unclear	Wet stone variant 3, bright and well developed	No clear traces	Probable use unclear, including soft material? Edge blunt and chipped	Transverse medial fracture (haft break?)		
Playa Grande	108	Edge-medial blank	Metamorphic, high-pressure*	Jadeite-bearing, pale green	7 (A-H)	1-2	70	27	17	Alluvial, testing of texture (contact unspecified)	Coarse pecking of sides	-	-	Edge 'retouch' likely result of grinding motion, no use traces	Transverse distal fracture		Edge damage may have rendered the blank indesirable, but unclear
Playa Grande	109	Edge fragment	Metamorphic, high-pressure*	Jadeite-bearing, pale green with blue tinge	7 (A-H)	1-2	47	43	16	-	Coarse pecking?	Rough, striated polish, well developed (cf. exp. 2782)	Traces unclear (relevant surface fragmentary)	Woodworking, experimental range (uneven smooth, bright polish, doming and reticulating). Edge slightly dulled	Skewed transverse medial fracture (haft break)		
Playa Grande	110	Edge fragment, roughout	Metamorphic, high-pressure*	Jadeite-bearing, green with acicular blue and mica	7 (A-H)	1-2	100	85	44	Alluvial, testing (dry grinding traces)	Hammering of sides (producing partial thinning), coarse pecking	-	-	-	Transverse medial fracture	Treated resin present on one face.	
Playa Grande	111	Edge-medial fragment	Metamorphic, high-pressure*	Jadeite-bearing, pale green with blue and mica	7 (A-H)	1-2	61	56	25	Unclear	Hammering of sides, coarse pecking	Wet grinding traces, unspecified	No clear traces (relevant surface fragmentary)	Trace signatures unclear, likely multi-use including several soft materials and 'unspec. distinct'. Edge destroyed	Fragmentation unclear		
Playa Grande	112	Distal blank fragment	Metamorphic, high-pressure*	Jadeite-bearing, pale green with blue and mica	7 (A-H)	1-2	45	30	19	Alluvial	Light flake shaping	-	-	-	Transverse medial fracture (fluid)		
Playa Grande	113	Edge-medial blank	Metamorphic, jadeitite*	Pale green	7 (A-H)	1-2	71	33	28	Alluvial, testing (dry grinding traces, poor platform)	-	-	-	-	Oblique fracture (fluid, unclear)	Resin attached to surface during or after fracturing	
Playa Grande	114	Medial fragment	Metamorphic, high-pressure*	Jadeite-bearing, unspec.	7 (A-H)	1-2	40	42	25	-	Coarse pecking	Dull lustre. Traces from contact with stone. Implied dry on poor platform	Traces of soft abrasive contact on side, binding?	-	Rectilinear and skewed medial fractures		
Playa Grande	115	Medial flake	Metamorphic, high-pressure*	Jadeite-bearing, pale green with blue and mica	7 (A-H)	1-2	42	35	6	Unsure	Unsure	Dull lustre. Traces from contact with stone. Implied dry on poor platform	-	-	Fragmentation unclear		

Playa Grande	116	Debitage or blank fragment	Metamorphic, high-pressure*	Jadeite-bearing, pale green with acicular blue	7 (A-H)	1-2	74	26	20	Alluvial	-	-	-	-	Fragmentation long axis		
Playa Grande	117	Edge-medial fragment	Metamorphic, high-pressure*	Blueschist with alterations	7 (A-H)	1-2	73	32	22	-	-	Wet grinding traces, striated polish (unspecified)	Unsure	Edge destroyed, traces unsure	Rectilinear breakage	Strongly to weakly developed wood polishes present in various locations, a relation with manufacture, haft, or use could not be determined	
Playa Grande	118	Edge fragment	Metamorphic, high-pressure*	Distinct darker green 'jadeitite', probably contains significant omphacite. Also contains mica	7 (A-H)	1-2	47	51	22	-	Pecking (coarse) preserved on sides	Wet stone variant 2 (matt, striated polish), scintillation underneath (unclear if preceding technique)	-	Woodworking, unspecified (holdover). Edge destroyed	Transverse medial fracture (fluid) with point of impact		
Playa Grande	119	Edge flake	Metamorphic, high-pressure*	Glaucophane matrix, with green minerals present	7	2	28	37	7	-	-	Wet grinding traces, intensely developed bright, striated polish (unspecified due to acicular matrix)	-	Woodworking, 'exceeding'. Edge fairly sharp	Use flake		
Playa Grande	120	Medial flake	Metamorphic, low-grade*	Typical greenschist	7	2	52	34	9	-	-	Densely striated. Wet grinding traces, densely striated, unspecified (cf. quartz arenite, 30 minutes)	Sole surviving side bears traces indicating wood friction	-	Fragmentation unclear		
Playa Grande	121	Biconvex celt	Undetermined*	Volcanic or HP metamorphic?	7	2	72	29	15	-	Pecking coarse to fine	Unclear	Male embedded, deep, in seasoned wood	Edge destroyed, some unclear polishes on bevel	No indications (resharpening would have been possible)		
Playa Grande	122	Medial fragment	Metamorphic, high-pressure*	Blueschist with alterations and jadeite vein	7	0	23	32	22	-	-	Intermediate lustre. Cf. 'sand-ground' traces, but brighter and greasier	No traces (relevant surface fragmentary)	-	Fragmentation unclear		
Playa Grande	123	Edge roughout?	Metamorphic*	Schistose, with dark blue–green–mica mottle	7	0	46	48	21	Unsure	Bifacial thinning, hammering of sides	Unsure	Unsure	-	Skewed transverse medial fracture unclear	Unclear dense hard material friction polishes, PDSM?	

Playa Grande	124	Petaloid axe	Metamorphic, high-pressure*	Blue and green mottled	7	0	62	34	11	-	Bifacial thinning, hammering of sides, coarse pecking of sides	Wet stone variant 1b, bevel only	Friction polishes in symmetric arrangement, indicating male slot	Traces from contact with pliable material, unspecified. Edge sharp but nicked	No indications		
Playa Grande	125	Distal roughout	Metamorphic, jadeitite*	Pale green, glinstering	7	0	41	32	16	Alluvial?	Hammering of sides, pecking of surface	-	Unsure	-	Transverse medial fracture	Slight friction smoothening on face	
Playa Grande	126	Medio-distal blank	Metamorphic, high-pressure*	Green and blue mottled	7	0	63	41	25	Alluvial	Direct flake thinning longitudinal, some hammering of sides	-	-	-	Transverse medial fracture with point of impact		
Playa Grande	127	Edge fragment	Metamorphic*	Dark green and blue interwoven	7	0	64	44	25	-	-	Wet stone variant 1a	-	Woodworking, 'exceeding'. Repurposed (pecked blunt)	Transverse medial fracture (haft breakage)		
Playa Grande	128	Edge-medial fragment	Metamorphic*	Blue-black-green schist	7	0	61	52	20	-	Hammering of sides	Wet grinding traces, possibly multiple signatures. Ultimately unclear	Traces unclear, presence of pristine resin	Edge repurposed, hammered blunt. Possible soft material wear traces remain behind it.	Transverse medial fracture, cracking along foliation		
Playa Grande	129	Edge-medial fragment	Metamorphic, high-pressure*	Blueschist with alterations	7	0	55	36	15	-	Hammering of sides into coarse pecking (induced foliation splitting), followed by fine pecking	Wet grinding traces, well developed bright, striated polish (unspecified due to acicular matrix)	No traces (relevant surface fragmentary)	Edge dulled. Well developed soft material polishes (covering, rough, greasy, invasive)	Transverse medial fracture unclear		
Playa Grande	130	Edge-medial fragment	Metamorphic, high-pressure*	Blueschist, typical	7	0	45	33	17	-	Hammering of sides, fine pecking	Traces from contact with stone on bevel, dull technique unspecified	-	Edge dulled. Well developed soft material polishes (matt, rough, concentrated, striated, fairly invasive)	Transverse medial fracture		
Playa Grande	131	Medial-distal fragment	Metamorphic, high-pressure*	Dark blue schist, with pale grey zone	7	0	54	41	11	-	-	Dull lustre. Gouged scintillation, relief present, possibly dry on hard sandstone?	Friction traces present, wood/ plant indet.	-	Oblique fragmentation (hafting?)		
Playa Grande	132	Medial-distal fragment	Undetermined*	Grey, fine-grained massive, isotropic	7	0	56	50	27	-	Hammering of sides, pecking	Traces from contact with stone, dull technique unspecified	-	-	Longitudinal impact scarring, transverse medial fracture		
Playa Grande	133	Flake	Metamorphic, high-pressure*	Blueschist with minor alterations	7	0	58	42	5	Alluvial	Debitage flake, split along foliation plane	-	-	-	Debitage		

Playa Grande	134	Medial fragment	Undetermined*	Brown-beige	7	0	84	52	13	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear		
Playa Grande	135	Celt roughout	Metamorphic*	Green with dark minerals	7	0	59	28	10	Secondary context, testing (dry grinding traces)	Hammering of sides	-	-	No traces	No clear indications, possibly due to over-invasive impacts	Unclear residue present on one side (distally)	
Playa Grande	136	Medial fragment	Metamorphic, high-pressure*	Blueschist with alterations	7	0	50	32	14	-	Unsure	Wet grinding traces, unspecified (short duration)	Traces of wood friction present	-	Rectilinear fragmentation		
Playa Grande	137	Distal fragment, roughout	Volcanic*	Dark grey to black, fine-grained	7	0	48	39	10	Unclear	Shaped through bipolar hammering of sides	Unclear	-	-	Transverse medial fracture unclear		
Playa Grande	138	Flake	Metamorphic, high-pressure*	Blue schist with some mica and green minerals	7	0	61	26	8	Secondary context	Thinning/foliation splitting flake, with overlapping scar	-	-	-	Debitage		
Playa Grande	139	Medial fragment	Metamorphic*	Darker green	7	0	51	26	19	-	Pecking marks remain	Traces from contact with stone, dull technique unspecified	-	-	Fragmentation unclear		
Playa Grande	140	Biconvex roughout	Undetermined*	Volcanic or blueschist	7	0	70	41	19	-	Fine pecking of shape, direct longitudinal flake thinning, bipolar hammering of sides	-	-	-	No indications		
Playa Grande	141	Edge-medial roughout	Metamorphic, high-grade*	Blueschist, typical	7	0	59	38	11	-	Thinning unspec., bipolar hammering of sides, fine pecking	-	-	-	Shaping mishap		
Playa Grande	142	Medial-distal roughout	Undetermined*	Volcanic or blueschist	7	0	77	40	20	-	Splitting of foliation layers from sides? Fine pecking, hammering of sides incl longitudinally, counterblow present	-	-	-	Splitting mishap longitudinal axis, transverse medial fracture with point of impact		
Playa Grande	143	Edge-medial fragment	Undetermined*	Volcanic or blueschist	7	0	58	48	9	-	Thinning scar persists, with fine pecking	Wet grinding traces, unspecified	-	Edge nicked and battered, but usable. Polishes unclear or absent	Haft fracture (oblique)		
Playa Grande	144	Edge-medial fragment	Sedimentary*	Brown with white, porous	7	0	74	41	25	-	Hinge scars from lateral hammering remain	Traces from contact with stone, technique unspecified	-	Edge slightly battered. Woodworking 'bleary cedar'	Use fracture oblique		
Playa Grande	145	Medial-distal fragment	Metamorphic, high-grade*	Probable blueschist. Medium-grained, even mixture of dark blue and white minerals	7	0	86	43	30	-	Shaped by light lateral flaking	Unclear	-	-	Edge portion fractured away		

Playa Grande	146	Edge-medial fragment	Metamorphic, high-pressure*	Blueschist with alterations (probably)	7	0	62	37	27	-	Fine pecking on intact medial surfaces	'Sand-ground' traces with high relief, bevel only, dense gouging	-	Edge abrasively blunted, no wear traces from use present	Rectilinear fracturing		
Playa Grande	147	Edge fragment	Undetermined*	Volcanic or blueschist	7	0	39	41	13	-	Unsure	Unsure	Unsure	Edge abrasively blunted (sand-ground), otherwise unsure	Transverse medial fracture		Wear is present and recognised, but too many uncertainties in too many biographical phases to value the analysis
Playa Grande	148	Edge-medial preform	Undetermined*	Volcanic or blueschist	7	0	60	29	17	-	Scar negatives indet., medium pecking	'Sand-ground' traces with high relief, bevel only, dense gouging. Rest of ground surface possibly abraded on hard coarse-grained sandstone, heavily striated (cf. exp. 2515-A)	-	Edge still blunt, no wear traces from use present	Fracturing unclear (in shaping?)		
Playa Grande	149	Fragment	Metamorphic*	Green, schistose	7	0	71	39	8	Secondary context	Unsure	-	-	-	Fracturing unclear		
Playa Grande	150	Distal fragment, possibly preform	Metamorphic, high-grade*	Blueschist, typical	7	0	43	36	19	-	Scar negative indet., coarse pecking, fine pecking	-	-	-	Transverse medial fracture	Wear friction polishes indet. on faces	
Playa Grande	151	Distal blank fragment	Metamorphic*	Pale green, mica-bearing, possible jadeite	7	0	50	24	21	Alluvial	Limited cortex flaking	-	-	-	Transverse medial fracture		
Playa Grande	152	Medial-distal fragment	Metamorphic, high-grade*	Blueschist, typical	7	0	63	42	16	-	Flake thinning unspec., hammering of sides, pecking	Absent	Multiple friction contact types present, but lacks straightforward distribution	-	Transverse medial fracture (largely fluid)		
Playa Grande	153	Edge-medial roughout	Metamorphic, high-grade*	Blueschist, lighter coloured	7	0	88	50	21	Secondary context	Direct bifacial thinning, hammering of sides, pecking	-	-	-	Potential production mishap, transverse medial fracture		
Playa Grande	154	Edge-medial fragment	Metamorphic, high-grade*	Jadeite-bearing, pale green	7	4	-	-	-	Unsure	Unsure	Mineral mirror polish on bevel, including micro-striations	Unclear	Sharp, no use traces	Transverse medial fracture		

Playa Grande	155	Edge-medial fragment	Metamorphic, blueschist*	Dark blue, fine-grained	-	-	47	31	8	-	Flaked, shaped through hammering, partial fine pecking	Dull, striated, mainly bevel. Scintillation with minor 'stony polish' development	No clear traces (relevant surface fragmentary)	No clear traces	Edge fracture, unclear if use related? Transverse medial break		
Playa Grande	156	Medial-distal blank	Metamorphic, high-grade*	Jadeite-bearing, pale green cortex	-	-	75	41	21	Unsure	Bifacial cortex removal flake, craqueler	-	-	-	Transverse medial fracture (fluid)		Type of natural surface is unsure
Playa Grande	157	Medial-distal blank	Metamorphic, high-grade*	Blueschist with green/pale mottle	7	6	67	52	15	-	Unsure reduction, coarse pecking	-	-	-	Fragmentation anisotropic unsure, coarse pecking	A short-term smoothening of a few facets on one face, but phase and intent uninterpretable	
Playa Grande	158	Edge-medial blank	Metamorphic, high-grade*	Jadeite-bearing, light pale green	7 (A-H)	1-2	59	33	20	Alluvial. Testing of texture (presence of polish, cf. exp. 2782)	Coarse pecking of sides, followed by flaking attempts	-	-	-	Fragmentation during manufacture, skewed transverse medial break		
Playa Grande	159	Flake debitage	Metamorphic, high-grade*	Blue-coloured schist	7 (A-H)	6	65	40	7	-	Thinning flake, foliation split?	-	-	-	Debitage		
Playa Grande	160	Edge-medial blank	Metamorphic, high-grade*	Jadeite-bearing, light pale green	7 (A-H)	6	44	40	22	Alluvial	Limited hammering or pecking of shape	-	-	-	Transverse medial break (fluid), possible point of impact		
Playa Grande	161	Edge-medial fragment	Metamorphic, high-grade*	Blueschist, typical	7	4	57	45	15	-	Hammering of sides, fine pecking	Scintillation, with dull, rough, flat, and striated polish from stone contact (cf. exp. 2782, but short duration)	Unclear	Woodworking, distinct (higher pliability), low intensity over whole blade. Edge battered	Skewed edge fracture from use, transverse medial break	Possibly a wedge	
Playa Grande	162	Roughout flake	Metamorphic, high-grade*	Jadeite-bearing, light pale green with blue tinge	7	4	41	39	11	Testing of texture (dry grinding traces, mild directionality)	Coarse pecking	-	-	-	Point of impact indicates flaked as production fracture	-	
Playa Grande	163	Distal blank	Metamorphic, high-grade*	Jadeite-bearing, light pale green	7	4	54	38	33	Alluvial	Bifacial flaking of cortex	-	-	-	Transverse medial fracture (fluid)		

Appendix 4

Analytical descriptions of paraphernalia

This appendix contains the technical and contextual analyses for the paraphernalia whose biographies were reconstructed in Chapter 9. Tables A4 and A5 provide basic overviews of the artefacts and their contexts in the same order and grouping as they appeared in Chapter 9, followed by a descriptive analysis of each artefact in the corresponding order.

Table A4: overview of materials with contextual data. Measurements are given in millimetres.

Fnr	Object	Material	Site	Z-s-s	Unit	Layer	Length	Width	Thickness	Section
276	Eye inlay	Nacre	El Cabo	90-92-70	-	1	13	11	n.a.	9.1.1
1359	Mouth inlay	Bivalve shell	El Cabo	75-26-73	-	-	24	11	02	9.1.1
1527	Mouth inlay	*Lobatus* sp.	El Cabo	84-59-85	-	-	23	09	03	9.1.1
2214	Mouth inlay	*Lobatus* sp.	El Cabo	85-50-63	-	-	14	08	03	9.1.1
2694	Mouth inlay	*Lobatus* sp.	El Cabo	85-31-28	-	1	21	13	n.a.	9.1.1
3104	Mouth inlay	Bivalve shell	El Cabo	85-51-42	-	-	36	07	02	9.1.1
882	Two-dimensional engraved plaque	*L. gigas* subadult	El Cabo	84-49-58	-	-	40	11	04	9.1.2
1401	Two-dimensional engraved plaque	Gastropod Shell	El Cabo	84-59-08	-	-	26	13	04	9.1.2
1718	Two-dimensional engraved plaque	Nacre	El Cabo	85-34-91	-	9	28	13	04	9.1.2
3678	Two-dimensional engraved plaque	*L. gigas* subadult	El Cabo	n.a.	-	-	48	11	06	9.1.2
2193	Three-dimensional plaque	*Lobatus* sp. body whorl	El Cabo	85-50-83	-	-	47	15	13	9.1.2
2154	Engraved tinkler	Old *Oliva reticularis*	El Cabo	85-50-92	-	-	36	19	16	9.1.3
726	Face-depicting shell preform	*Conus* sp.	El Cabo	84-39-111	-	-	33	22	20	9.1.3
1339	Engraved ring-like object	Bivalve shell	El Cabo	84-59-39	-	-	27	16	03	9.1.3
3107	Face-depicting shell	Old *L. gigas*	El Cabo	85-51-82	-	-	39	27	16	9.1.3
S615	Tooth pendant	Pantherine cf. *Panthera onca*	Brighton Beach	-	A	1	64	17.5	17	9.2
S208	Tooth pendant	*Sus scrofa*	Brighton Beach	-	-	0	58	9	10	9.2
1748	Tooth pendant	Cf. *Trichechus manatus* incisor	El Flaco	63-82-F13	32	-	11.5	15	7	9.2
023	Dental pendant	Scaridae pharyngeal grinder	El Flaco	63-64-85	1	5	39	23	7 (teeth), 4 (plate)	9.2

2420	Dental pendant	Myliobatoidei dentary palate	El Cabo	-	-	-	20	13	02	9.2
115	Dental pendant	Myliobatoidei dentary palate	El Flaco	63-74-45	6	2	31	17	10.5	9.2
090	Earplug	Bone, probably marine	La Luperona	64-16-08	4	1	40	14	13	9.2

Table A5: overview of materials lacking contextual data. Measurements are given in millimetres.

Int. no.	Object	Material	Collection	Provenience	Provenance	Length	Width	Thickness	Section
p001	*Guaíza*	*Strombus pugilis*	Willcox	Local collector	East Grenada	76	54	41	9.1.3
LP-01	Flute	Cf. deer long bone	Charles	Cliffside	La Poterie	203	-	27	9.3
LP-02	Flute	Cf. deer long bone	Charles	Cliffside	La Poterie	95	-	18	9.3
p005	Flute	Unidentified long bone	Willcox	Local collector	Telescope point	182	21	27	9.3
p007	Flute	Possibly deer long bone	Willcox	Local collector	Telescope point	148	-	23	9.3
p006	Tube	Human tibia	Willcox	Local collector	Telescope point	318	-	42	9.3
p004	Face-depicting object	Wood	Willcox	Fort Jeudy beach	South Grenada	34	31	11	9.4

A4.1 Shell objects

Object C 276

Object C 276 originates from south of the excavated and surveyed areas, the recorded zone extending over the cliffs. It is unclear what this means and whether the recording is not inexact, but one possible explanation is that it represents erosion of the midden deposits.

Procurement and manufacture

The base consists of columnar nacre, with the opposing surface sporting a depression with unmodified surface, suggesting that was the internal side of the mollusc. The affix material is unclear, but an organic and carbonaceous nature is suggested by biologically patterned elements visible under magnification (Figure A13) and by SEM-EDAX compositional measurements: these showed calcium, carbon, and oxygen as the major elements for both areas. Two possible identifications commence from here on. The first is that the base was made out of the nacreous section from a large bivalve, upon which an extraneous affix adheres. The second option presumes that both base and affix are made of the same *Cittarium pica* shell, a black and white patterned gastropod. Detailed examination further shows that the reddish coloured boundary between the affix and the nacre is texturally similar and connects

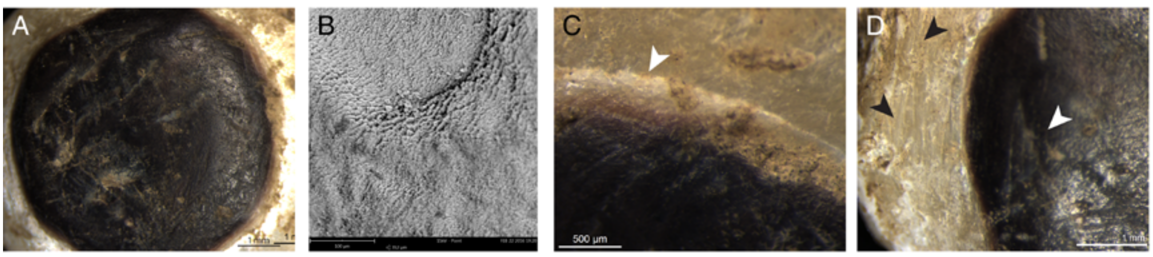

Figure A13: Views of C 276. A) close view of the affix. B) SEMgraph of the nacreous sheet structure. C) conjoining of the two aspects. D) longitudinal striations on both at several intersecting parallels.

the two seamlessly, giving no indication of a boundary between materials or an adhesive fill (Figure A13, c). Manufacturing traces on the object also favour the latter identification. The nacreous base is characterised by elongated coarse grooves associated with abrasive wear, which are most probably associated one of the local lithic materials (coarse sandstone, beachrock) as handheld abrader, used in a scraping or single-stroke abrasion motion. These grooves are the only traces visible, and extend to the black 'affix' (Figure A13, d). Here they are present on the walls and associated with the facetted appearance of the outline, as well as the flat surface itself. The inner side of the nacreous base bears the same traces, but the retention of an original depression in the centre indicates that abrasive contact here was brief, and probably focused on flattening taxon-specific protuberances. Finally, analogous coarse parallel grooves were seen on the sides of the object, rounding off the production of the inlay. In an earlier stage these were thought to be cutting traces related to the separation of the blank from the shell, but this interpretation did not hold. If such an activity had taken place, subsequent abrasive wear to fit the piece into its intended socket has erased the evidence.

Use and deposition

Wear traces resulting from use are not observed on this piece. Residues were not directly observed either, though there may still be an unverifiable presence underneath the x-shaped configuration of soil seen on the back. The damage located on two of the three points is consistent with forces acting on the fringes of the object, but could result from multiple actors. Forceful insertion is one possibility, as are mistakes during manufacture of a fragile object. Deposition into the midden may have followed the breakage of the object in the case this would have rendered it unsuitable for the task of inlaying. Otherwise, value recontextualisation concerning the composition artefact itself may have been at play, with the inlay being deposited as part of a larger event now lost to degradation.

Objects C 1359, 1527, 2214, 2694, 3104

C 1359 originates within a 2x2 test pit with both early and late Ostionoid ceramics and including some mixed 10th century Chicoid materials in the upper layer (Samson 2010, 126-127). C 1527 is located centrally in Structure 2 of House Trajectory 3, which belongs to phase *a* of the Chicoid occupation dating to the 9th and 10th century AD (Samson 2010, 248-251). C 2214 is located on the border of a phase *a* house plan that is overlapped by House Trajectory 2, dating from the 11th century to the early colonial period (Samson 2010, 258), and could have been associated with either. C 3104 is recovered from the northern border of House Trajectory 2 plans, some meters away from other paraphernalia. Finally, C 2694 was recovered from the top layer of a partially excavated house floor west of the main excavation area (Samson 2010, 131-132), and is probably associated with the later Chicoid occupation.

Procurement and manufacture

Two of the inlays are made of white bivalves with three layers and a cross-lamellar central microstructure, which is evidenced by the internal curvature still present on the backside (Figure 45, A14, a). The other three are made of the white, heavy shell of a *Lobatus* taxon, and are uniform on all sides. These raw materials can be obtained nearby the site. Evidence regarding the separation of the preform from the shell is lacking in most, but persisting inflections around some of the edges suggest that the blanks may have been separated by sawing originally (cf. shell blank separation in Breukel and

Falci 2015). The sides have all been abraded afterwards, with a fracture occurring in C 2694 leading to the abandonment of that piece. There the facets from different abrasion angles are still present, these have been smoothened in the others (showing it was not simply a white oval inlay). The front and backside are abraded against hard non-coral mediums, given the sharp boundary with the natural depression in C 1359 and semi-hard rough material polish in C 3104 (Figure A14, b).

The engraving sequence appears consistent between the four pieces, and was applied after the abrasive phase as indicated by a gradual boundary with the surface. The elongated incisions are placed first, and the parallel incisions afterwards, crossing its depth in some instances and failing to reach it in others. The main incisions are all sawn deep and mostly sport steep V-shaped walls while the bottoms are variable, ranging from sharp to flat and bowl shaped (Figure A14, c-g). Blunt edges perhaps made of coarser lithic tools were likely used for all, as the bottom is only slightly wider than that of the *L. gigas* sawing experiment. Though striations would be expected, the microstructure has deteriorated negating this variable (Figure A14, h). Further, misplaced onsets with a V-shaped profile are observed on C 1359, whose profile matches a solid edge and is less affected by the modelling effect deeper sawing has. These grooves are unlike any of the organic tool results discussed in section 5.3.2 and lack the inflected surface of subsequent widening. Only in C 3104 is a teeth a potential alternative for two shallow furrow grooves (Figure A14, e), but the V- shape of the other grooves is typically lithic.

Use and deposition

C 1359 and C 3014 displayed a polish on the centre portions of their backsides that is potentially associated with use friction. There is a correlation with a macroscopically observable darkened patina,

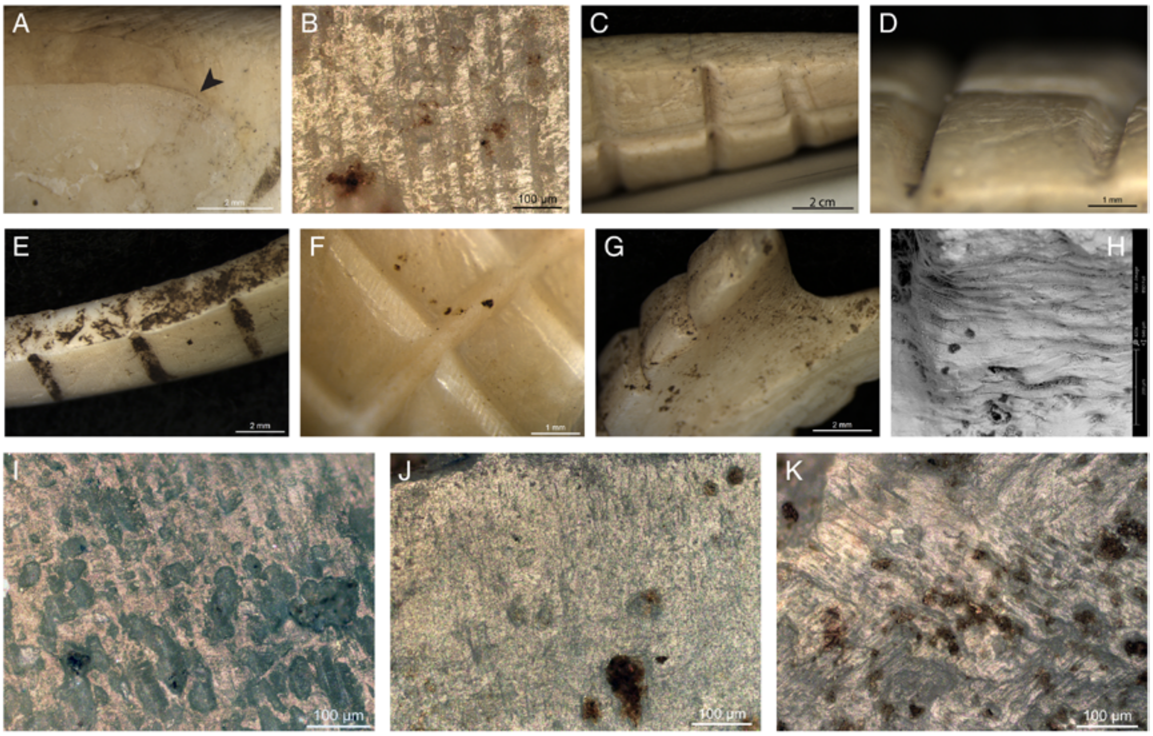

Figure A14: A) backside of C 1359 showing internal surface. B) semi-hard material polish on the frontside of C 3104. C-G) stereographs of incisions on C 1359, 1359, 3104, 1527, and 2214. H) SEMgraph of eroded bottom of an incision on C 1359. I & J) micrograph of polish associated with soft material contact on the backside of C 1359 and C 3104, the latter also showing PDSM near the top. K) micrograph of side of C 3104 showing comparable traces.

especially on C 1359. The polish is present fairly evenly in this area, crossing the structural laminas which are organised in a consistent ridge-furrow topography (Figure A14, i-k). With a dull and rough texture and fairly invasive, vertical development it indicates a soft contact material, rather than mineral or coral (probable manufacturing abrasives) or wood (a typical socket), and the lack of corrugation argues against ceramic contact. Rather, a material such as skin/hide or a spun fabric of cotton fibre is implicated. A related modification is found on the side of C 3104. Whilst potentially characteristic, at present there is not enough to go on about regarding the contact and if it is consistent with use as an inlay. The front displayed no traces of wear. With respect to the depositional context, the broken half-fabricate was in all likelihood discarded to end up in a domestic sweep accumulation. Similarly, the midden context of C 1359 indicates such a depositional trajectory. The other three specimens might have been caught up in a process of discard and sweeping, or have left the hosting object in-situ in the spatial contexts in which they were found (this possibility is further expanded in the biographical reconstruction).

Objects C 882, 1401, 1718, 3678

C 882 was found inside House Trajectory 4, which Samson (2010, 259) considers as probably contemporaneous with House Trajectories 1 and 2 dating anywhere between 1000-1504 AD. C 1401 was found at the edge of Structure 7 from House Trajectory 3, likely associated with a sweep accumulation from the Chicoid occupation. C 3678 is associated with the habitation area (Samson 2010, 278), but not further specified. Finally, C 1718 is derived from layer 9 in the 2x2 excavation unit 85-34 north of the habitation area, inside Ostionoid midden deposits rich with paraphernalia (Samson 2010, 125). The deepest layer directly below it is dated to 550-691 cal. AD (2σ, GrN-31416) and layer 4 above it to 729-938 cal. AD (2σ, GrN-31415), indicating that the finds in between date to the 7th Century AD (Samson 2010, 120).

Procurement and manufacture

The two intact plaques retain a wavy elevation of the internal layer, indicating they are made of a specific part from *L. gigas* subadult lips in which this morphology is naturally present. The broken piece is unidentified, but the host shell has a cross-lamellar structure and so could be from a similar species. Some cutting motions are implied in the separation of the plaques by the irregularities of the lateral borders, but most evidence of this stage is removed by later reworking. They all display the same sharp boundaries between the sides and the back, unworn by use related contact or rounding gestures during later smoothening phase (Figure A15, a-c). Whichever specific abrasive technique was used could not be reconstructed, but its application is evidenced by the sharp angle between the flattened backside and its interior depressions, best seen on 882. A wear contact polish seen on both sides is discussed below.

The engraving and perforation steps came after. Both intact shell plaques share a checker-board pattern as their central element (Figure A15, d). This is formed by three incisions on the short axis bounded by a deeper one on each end, cut through by four or five incisions on the long axis. These 'checkers' were probably intended to have had consistent square dimensions, but some incisions are slightly offset. Nevertheless, there is a good control of depth, width, and avoidance of overshooting into the lateral elements. The grooves have angular V-shaped walls, though the bottom is not sharp anymore (Figure A15, e). Their morphology is well comparable the flint experiment but they are slightly broader, suggesting sawing with a coarser-grained chert or another rock. However, the grooves separating the central and lateral elements are much wider still and show some inflection on the side. These were probably set with a different tool, or alternatively, briefly enlarged with a file. Unfortunately, soil encrustation and erosion of diagnostic variables prevent an inference at the tool material.

The central element of C 1401 bears some faint chert-made incisions, but the lateral elements of all bear differently made engravings. In C 3678 they are elongated M-shapes produced by three wide grooves, and in the other two they are open chevrons turned sideways produced by an excised hourglass running along the long axis paralleling additional wide grooves (Figure A15, f-h). Crossed cut-marks on 1401 show its hourglass cuts to have been set with incision, after which the superfluous material was probably removed by chiselling with a lithic point. The wavering pathway and homogeneous walls of the grooves in the other two, as well as the furrowed topography of the excised areas, are indicative of such a technique. Side notches forming the chevron openings of C 882 are probably filed similar to above. None of the grooves now bear internal striations or wear polishes.

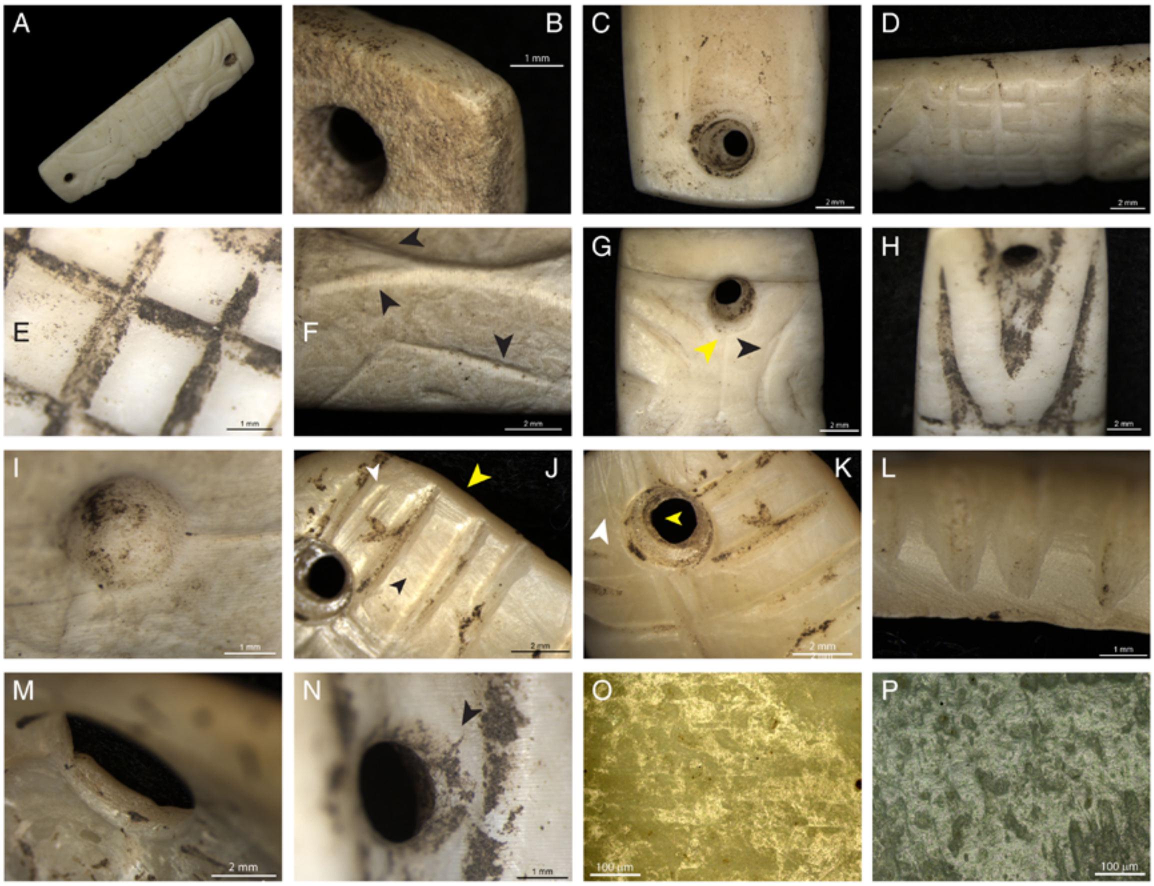

Figure A15: A) Side view of C 882. B) Corner of C 1401. C) Smoothened back view of C 882 with abrasion level and lower perforation. D) Side view on chess-board pattern incisions on C 882. E) Close-up of centre element of C 3678. F) Sideway view of the hourglass incisions and parallel cuts in C 1401, individual strokes marked by black arrows. G) Front view of half-moon cuts and upper perforation on 882, use-wear deformation facet marked by yellow arrow. H) Close-up of lateral element of C 3678. I) Unfinished perforation in the centre of C 1401. J & K) Direct and oblique light views of incised side of C 1718 evidencing sawing (yellow arrowhead), abrading (small black), incising including misplaced cut-marks (small white), scraping traces (large white), the perforation profile, and a wear facet inside it (small yellow). L) Side view of C 1718 showing sawing, interlaced abrasion, and groove profiles. M) View of the central perforation inner profile. N) Wear facet in the ridge of upper frontal perforation in C 3678. O) Wear on the back of C 882. P) Well developed wear from softer material contact on the front of C 882.

Although the perforations in C 882 are slightly narrower than in the other two plaques, the perforation technique is consistent between the three (Figure A15, g-i). All display a biconical profile, where a shallow onset originates at the front whereupon it was met by a second back onset perforating through for most of the distance. The deep conical profile and thin concentric striations in asymmetric clusters indicate that solid conical drill bit bits were used in this process, probably palm drilling with a lithic tip (cf. Lammers-Keijsers 2007, 63).

The nacreous piece has a different origin, for which the host shell is not identified. As with 276 above, the intermediate layers appear to have been removed down from the exterior surface. The back side retains parts of what appears to be a foliated structure, probably the original intermediate shell layer, whose removal involved both cutting and abrasive contact. The sides show clear evidence of lithic sawing retained on one side, whereas the other three bear clear marks of abrasion (Figure A15, j-l). Traces of abrasive contact remain on the engraved surface, and it is clear also on the back side as a shaping technique. It appears a coarse grained stone platform was used, based on the overall regular alignment of the striations. There are many clusters of more erratic striations superimposed that could indicate later contact with a coral with sand or a scraping edge, though the relation to manufacture remains a question. The engravings are all incised with a tapered lithic edge or point, indicated by the straight V-shaped walls, elongated striations therein, and smooth bottoms. They compose a single horizontal line intersected by various vertical lines as in a teeth pattern motif, though in fact the lines 'interrupted' by the perforations were set at different moments. The side perforations are biconical and were drilled with a lithic bit. The main perforation is straight-walled internally, but bearing inflections on either side (Figure A15, m). This probably indicates bi-cylindricality for which one possibility is a hollow or tubular bit, the counter placed to avoid fracturing the shell layer despite the short distance. However, it may also have been an originally smaller perforation which was widened using a straight tool, such as the tip of a staghorn coral (*A. cervicornis*). Not enough microwear traces remain to reach a conclusion on the actual tool material involved.

Use and deposition

The main evidence of use pertains to the method of suspension, evidenced by deformations within the inner rim of the perforations and surrounding polish from string wear (Figure A15, c, g, k, n). In C 882, small disfigurations in the concentric outline are starting to show. In one it is oriented outwards along the long axis, whereas the other shows two deformations along the short axis. Both exits have polish development indicative of string wear oriented along the long axis, with some more to the sides matching the disfigurations, and some corresponding polish on the inner ridges. In 3678, rather, both perforations have a single suspension facet both of which are oriented equally along the short axis. String wear polishes are also most strongly associated with this orientation, though spread a bit further. The nacreous plaque has one suspension facet oriented towards the central perforation, and another outwards 45° offset from the long axis, neither corresponding to a groove. String wear polishes were not identified here, and for none is the material of the strings interpreted. The central perforation showed no convincing development of wear traces. Finally, no wear could be recorded on C 1401.

A second line of evidence pertains to a wear polish. This is a dull, rough, and invasive soft contact polish connecting through reticulating bands, leaving craters in between (Figure A15, o-p). Both intact plaques had an strong development of this trace signature on the engraved frontal aspects, and a weak but recognisable development on the abraded back side. Options may include soft plant matter, fabrics and fibre strings, or skin. The nacreous plaque, which is far better preserved, shows a strong rounding development on the sharp angles and abrasion traces on the frontal surface. The distribution would indicate that whichever responsible contact was focused mainly on the engraved front side, which argues against ornamental display. However, the provenience of the polish is not clear. Since the naturally reflective topography of the nacreous layer has deteriorated to a softer and rougher appearance, it must be considered that this PDSM could have broken down different wear contact polishes along similar lines. This would render this type of wear polish suspect, merely evidencing the absence of a contact polish that could include manufacture. The presence of similar softer modifications throughout the shell assemblage argues in favour of this explanation, though, the spatial distributions do appear to correspond to typo-functional explanations. This is certainly not in doubt for the nacreous plaque.

Regarding the deposition, the fractured state of C 1401 in combination with its sweeping deposit association strongly indicate that it was thrown away after losing functionality. The intact plaques are associated with the habitation, but not with informative spatial locations. The nacreous plaque similarly lacks the contextual evidence to infer a depositional pattern from.

Object C 2193

This object derives from a sweeping deposit in the non-overlapped floor plan of the structure 9 in House Trajectory 3. Like structure 2 (above), it has Chicoid associations and possibly dates to the 9th and 10th century AD.

Procurement and manufacture

The object is made from *Lobatus* sp., and it is suggested to be specifically from the space in between prongs as this would facilitate the curvature of the blunt protrusions. No traces remain of material removal, shaping, and treatment of the surface. Although the perforations retain a consistent layer of concentric rings inside, these are not technological but relate to the layered structure of the shell. However, some technological features can be glanced from their outline. Four perforations are placed on opposite sides of the dorsal ridge and connect with their partner (Figure A16). These have a conical outline and a broad leading edge, suggesting they were placed with a solid instrument not quite as angular as a flint-tipped drill, but with a more abrasive lead. From the ventral side a larger perforation crosses into the smaller leading edges (Figure A16). Even though the technical characteristics are the same, the larger dimension implicates a second tool and therewith access to a certain degree of variability in the material technology.

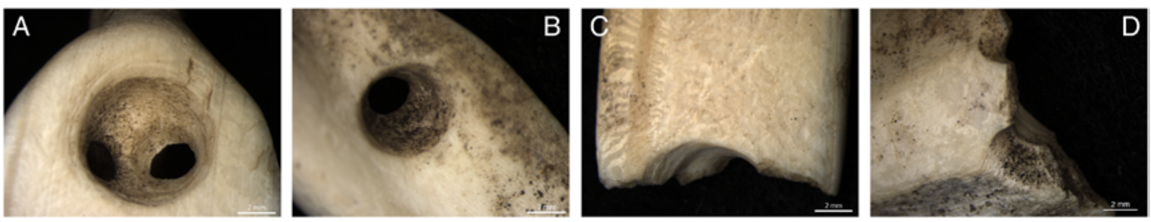

Figure A16: A) ventral view on intact perforations. B) lateral view on small perforation. C) ventral view on broken perforations. D) dorsal view on broken perforations.

Use and deposition

Some traces indicative of use are present on the object. Most promising are deformations in the constricted inner ridges of the small perforations, which are clear indicators of a contact material tugging at those angles. They are located on either lateral side of both perforations, not proximally or distally, indicating that the stress was oriented perpendicular to the long axis of the object. String wear seems obvious, either as multiple string loops tugging or as a double weave. However, this orientation is not conclusive towards either hypothesised use, nor to as of yet unformulated alternatives. Presumably the broken perforations were also subjected to a string, and fractured as a result of tensile stress thereby ending the object's usability.

The ventral side bears a friction gloss, which carried striations oriented along the long axis. The protuberance bears a golden-brownish gloss. Neither of these proved convincing of any specific types of use when examined under high magnification, however. At best, they may correspond to different original contact zones thus indicating a probable functional design behind the object morphology. The ventral surface is etched, but this is probably taphonomic in nature, whereas the remaining surface is generally smooth. This is significant given that it evidences the absence of a major type of use wear associated with lure hooks, namely marks left by fish teeth (Cristiani *et al.* 2016).

Object C 2154

C 2154 derives from a sweeping deposit in the non-overlapped floor plan of the structure 9 in House Trajectory 3, noted to have Chicoid associations possibly dating to the 9th and 10th century AD.

Procurement and manufacture

C 2154 is made of an old *Oliva reticularis* individual, implicated by the erosion to have derived not from a marine context but from a sediment. The erosion inhibits high magnification analysis and the recognition of diagnostic technological features, yet several inferences can be made at the lower level. The first step in modification is the removal of the apex. The rounding observed on the rim is similar to the results of the apex removal grinding experiment, though erosion precludes an inference on the platform (Figure A17, a). While the inner whorl may have partially fractured during this procedure, it was subsequently broken out further through pressure.

The incisions are short, shallow, probably single motion, and present a profile analogous to as seen in the objects discussed previously (Figure A17, b-c). The walls are tapered and the bottom flat to U-shaped. Most probably, a lithic edge was used to place them. The pattern resembles a partial square with two marks inside, but no recognisable motif. Finally, the perforation bears near straight walls, with only a slight taper to the inside (Figure A17, d). The outline is oval and uneven due to advanced wear. The smooth curve seems to imply a rotary technique, though the combination of advanced wear and erosion precludes a clear distinction from careful percussion, since an originally ragged outline could have been completely obliterated since. However, it is clearly not sawn or abraded.

Use and deposition

As noted, the outline of the perforation on the tinkler is misshapen, with a deformity oriented upwards. Similarly, the rim is much more rounded in that segment, and the surface spanning the distance towards the rounded siphonal canal is texturally different from the generic eroded surface (Figure A17, e). This probably indicates wear smoothening with a certain freedom of movement,

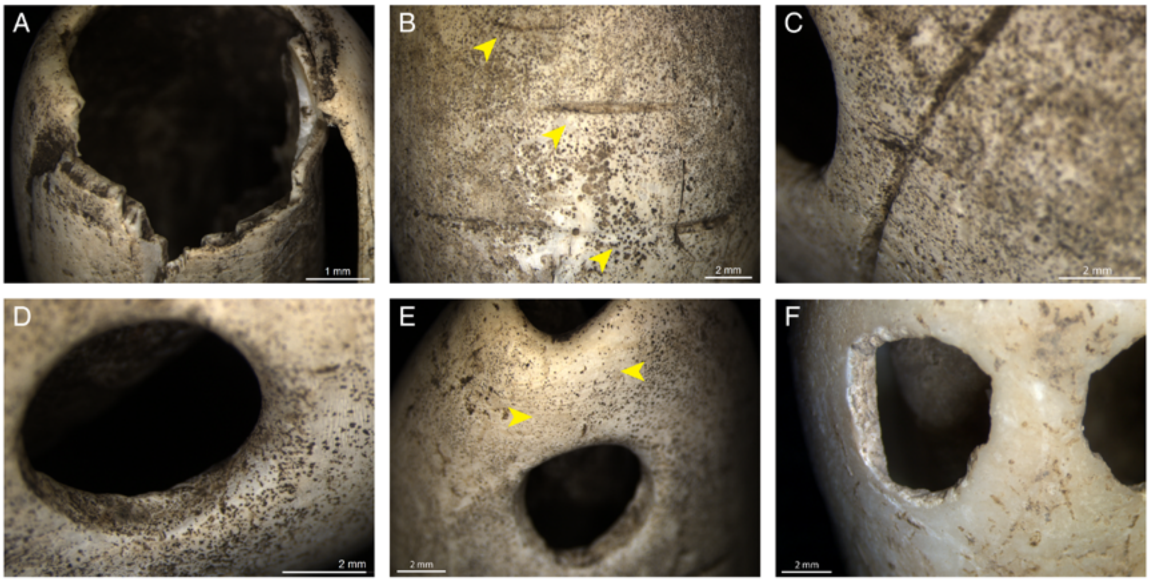

Figure A17: A) opened apex of 2154. B & C) details of incision marks. D) side view of perforation. E) worn facet between perforation and siphonal canal. F) perforation on 0762 (photo by G.C. Falci).

allowing use friction to erase some of the superficial erosion (the structural layering is observable). It matches well with the facets into a string configuration that twists around the siphonal canal, and may have been knotted there, in order to secure the fastening. The most probable event of deposition is discarding after critical failure of the mouth, since this would affect the acoustic properties. The scar shows the force radially dissipating towards the inside (Figure A17, a), indicating the impact point came from the outside, possibly at or near the lip.

Object C 726

C 726 was found near the southwestern part of the main unit, but not in definite association with a House Trajectory.

Procurement and manufacture

C 726 is made of a *Conus* sp. shell, which given the faded colouration and rounding of its features was possibly an empty shell collected at the beachfront, rather than by harvesting a living (venomous) cone snail. The modification consists of two large perforations set at the same height on the part of the body whorl that opposes the aperture (Figure A17, f). The a-concentric shape, lack of abrasive thinning, and jagged walls indicate the use of a percussive technique to break through the shell. This could be indirect pecking, direct hammering, or pressure; the evidence is not clear. Rather, the morphology of the rim and consistent pattern of small impacts leading into the interior suggest that once the holes were opened, these were carefully broken out further to work towards a more rounded appearance. The straight lateral breakage lines indicate that the obtaining of perfectly round holes was prevented by a poor anticipation of the anisotropic properties of the cross-lamellar microstructure of *Conus* (Currey and Kohn 1976), which instead induced a vertical dissipation trajectory of the forces of impact. They are parallel to the growing edge of the lip, consistent with the breakage properties of *Conus* as described by Szabó (2004, 111). The shell does not appear to have been modified thereafter.

Use and deposition

No clear wear traces or residues have been observed on C 726 that could be associated with its use life. Given the incomplete manufacture the most probable interpretation is that it was discarded without ceremony due to perceived flaws in the production of the eyes. The walls of the perforations are unworn and do not match functional use such as found in the double perforated cowry scraping tools from Polynesia (Allen and Ussher 2013).

Object C 1339

C 1339 was found at the back of Structure 7 from House Trajectory 3. It likely derives from a sweep accumulation dating to the Chicoid occupation, but no more precise chronology can be given.

Procurement and manufacture

The object is made of a white bivalve with a three-layered shell, the foliated middle layer wedged by cross-lamellar outer layers. Several technological features are present, but their interpretability is poor. A perforation is set within the umbo near the ring space, while another depression is found above it. The perforation is biconical, with the cone coming from the interior aspect making up most of the length (Figure A18, a). Although the walls are tainted by graphite, the outline of the perforations is similar to those of the plaques and C 2193 discussed previously. A solid lead is thus also implied in this object, e.g. a broader flake or blunt abrasive point. The circular depression on the umbo area bears impact points, indicating it was made by light impacting gestures with a pointed tool, which could be light or indirect percussion or simply pressure. The side of the bulge lateral to it is engraved by two direct incisions, and a third depression delineating the jaw that bears the remnant of a longer notch (Figure A18, b). These, however, are too worn to attempt an interpretation. Some remnants of a potential manufacturing polish are observed in the same area, and appear further down the ring and in between the reflective patches on the interior aspect. These are bright, rough, flat, cratered, located

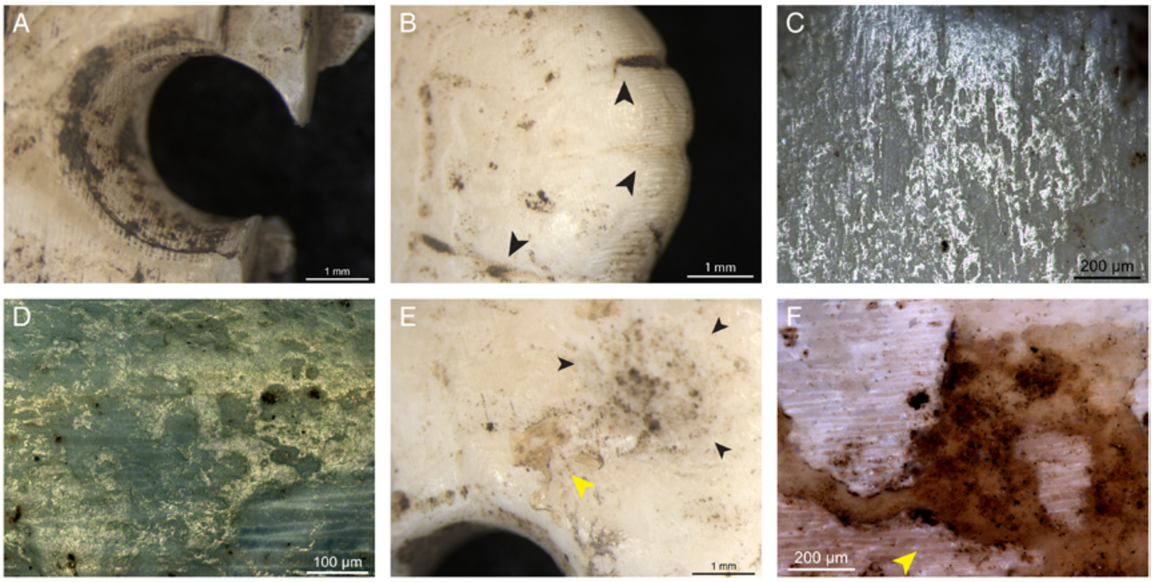

Figure A18: A) interior view of full perforation. B) Side view of incisions with the sediment-filled third groove partially in view. C) bright polish, suggesting a harder contact material. D) matt, invasive polish, suggesting a soft contact material. E) micro-residue on the exterior aspect umbo portion (yellow arrow) and out of focus 'eye' depression. F) High magnification polarizer view of the same residue (arrow matches orientation).

on the ridges created by the lamellar structure, and carry some striations (Figure A18, c). Though it does not correspond to any of the materials discussed and experimented with here, the attributes indicate a hard material contact and locational patterning indicates a widespread modification. Both external layers as well as the side shape have all also been smoothened down. Other manufacturing stages present in the artefact are the broad blank separation, coarse removal of material for the outline, and removal of material internal to the ring, but no traces remain.

Use and deposition

Wear traces are not observed within the circumference of the ring itself, not as polishes nor as rounding or fatigue as a result of friction. The umbo area, in particular the perforation set in it, is likewise devoid of both stereoscopic and microscopic traces of post-manufacture contact. Only the distal outer side of the ring bears wear traces which may be affiliated with a use. This is a dull, rough, and invasive soft contact polish connecting through reticulating bands of the same type as seen on the plaques (Figure A18, d). As before, options include soft plant matter, fabrics and fibre strings, or skin. However, given the lack of a clear spatial distribution and the lack of corroborative traces observed in the inner ring, the nature of this contact will not be further ascertained.

The exterior aspect of the umbo a few concentrations of a resin-like micro-residue, located around the depression interpreted as an eye (Figure A18, e-f). It is light brownish in colour and sharply delineated lacking granularity, as if a viscose fluid, topped by an accumulation of soil. The nature of this residue is unknown.

Finally, the fracture through the centre likely induced deposition. Given the interaction of the shell layering with the propagation of force, the origin and directionality cannot be estimated without reference experiments. While a measure of force is implied in the action, this could have been accidental as well as tension-related structural failure.

Object C 3107

C 3107 was recovered from a natural depression in the bedrock, located just outside of overlapping structures belonging to House Trajectory 2. This is the chief house trajectory rich in both indigenous paraphernalia (frog beads, threepointers) and ultimately in early colonial material culture (pottery, glass beads). Due to its context, it has been interpreted as an abandonment deposit (Samson 2010, 288-289), most likely dating to the 13th century AD.

Procurement and manufacture

The *guaíza* is shaped out of the lower end of a *L. gigas* columella, but not on one deriving from a fresh specimen. Rather, an already broken and eroded piece served as a suitable blank, which was probably obtained from an inland storm terrace (A.T. Antczak pers. comm. 2016). The extent to which the piece had attained its present outline in this context is not entirely clear. Though no traces are present that relate to shell separation, this is true for most of the assemblage discussed hitherto and deemed not a reliable indicator for the absence of this activity. Fortunately, good evidence remains of frontal surface smoothening, the engraving techniques, chiselling of the eyes, and drilling of the pupils. Thus, it is possible that its gross morphology is a product of taphonomy prior to any human alteration.

The early operational sequence is approximated as follows. A moderate amount of material was removed to create the nose bridge and decline the mouth area. This follows from the fact that a normal

L. gigas columella possesses a smooth curve, whereas in the *guaíza* these areas are depressed. However, the techniques involved with the nose bridge have been obscured by later wear or patination, and given the taphonomical provenience it is unclear if any material was removal for sculpturing the outline of the face. The forehead and cheeks mostly follow the natural curvature, and the dimensions of the side are probably the result of natural erosive processes as little wear relates there. The patinated portions of the shell are considered natural, in line with the discoloration on the backside, though differences in their intensity might still relate to wear trace concentrations (in use and deposition).

Two wear trace signatures remain from the techniques used for finalising the shape. Evidence of scraping is observed on the frontal area, running from the centre to the side (Figure A19, a). The band of parallel striations indicate some abrasive edge or matrix being dragged over the surface, but exactly what type of tool is difficult to make out. The motion likely served to smoothen out rugosities remaining from the previous stage. Second, excision through repeated incision was applied at the very least in shaping the underside of the nose (Figure A19, b). Here, two crossed cutting grooves remain,

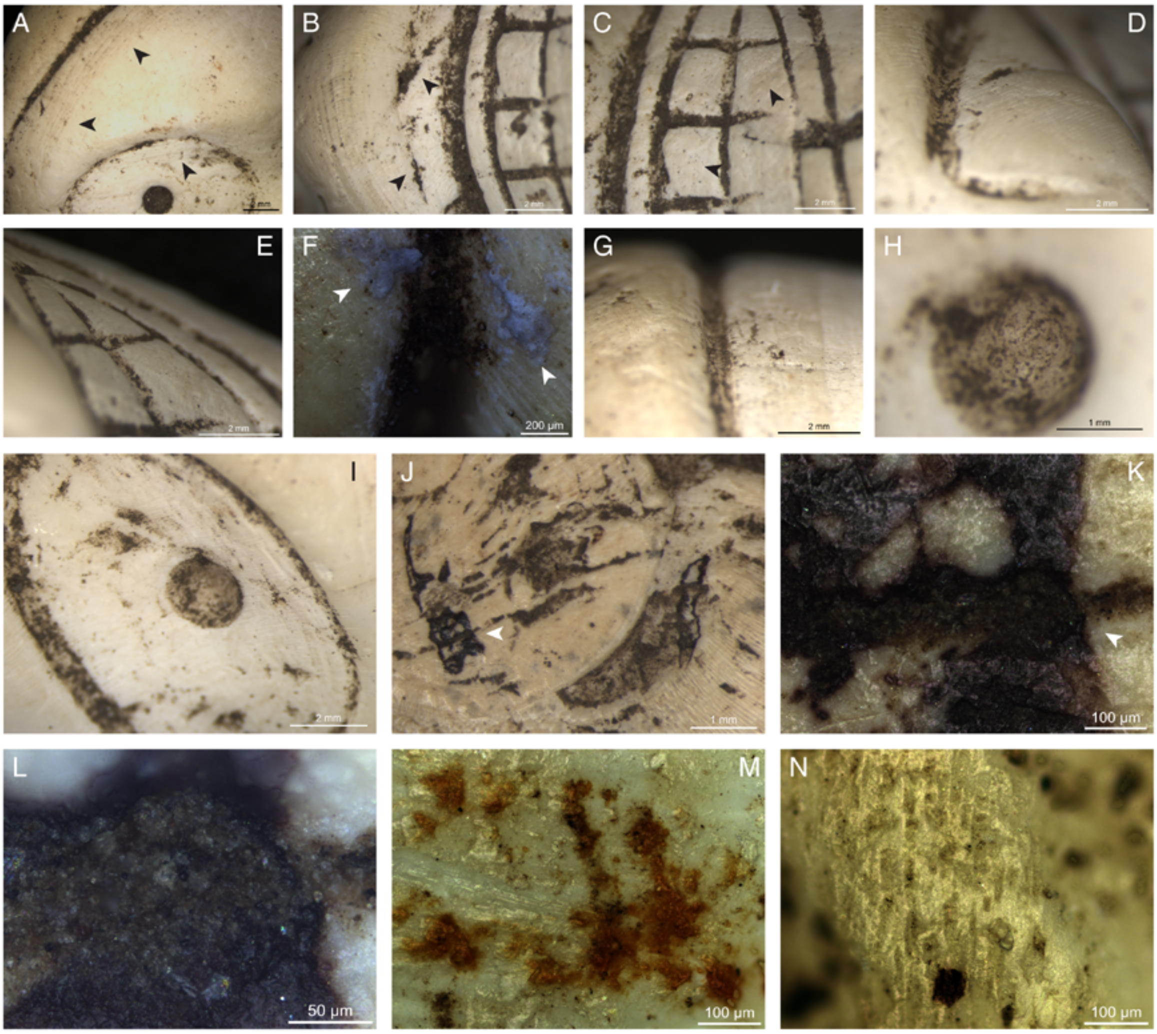

Figure A19: A) scraping or abrasive marks on the forehead. B) incisions crossing underneath the excised nose. C) scraping of the teeth area. D) wider diagonal groove. E) incisions delineating the teeth and lips. F) view of lip groove, with modern residue. G) headband incision. H) leading edge of left eye perforation. I) topography of the left eye. J, K & L) strands of black residue overlain by local sediment, arrows indicate the succession of magnification. M) red residue of the forehead. N) micropolish corresponding to macropatina.

giving rise to the idea that excision entailed sawing through the centre, followed by the breaking or also sawing away of material. Some smoothening is implied in the final surface, though this begs questions both why no high magnification traces were found in this area, and why the scraping traces elsewhere where not erased. The surface of the 'teeth' again bears marks of scraping to finalise its smoothness.

The engravings include one horizontal and six vertical straight incisions delineating the teeth, surrounded by two curved incisions for the lips, as well as two diagonal grooves delineating the cheeks, four incisions shaping the nose wings, and a single curved incision placing the headband. Despite some obstruction of view due to sediment, the incisions are partially observable and appear relatively uniform (Figure A19, b-g). Most are shallow and symmetrical, with U-shaped bottoms and few striations directly discernible. The lip grooves are somewhat wider and deeper, whereas towards the central part of the headband and in the deeper diagonal groove the walls become tapered. Clear onsets are visible in the headband and in several of the sub-incisions of the teeth, ruling out the use of a chiselling motion. A solid point is implied, but the incisions do not match the experimental or published variables expected of flint edges, nor those of the experiments with organic tools. Rather, additional experiments should focus on engraving with sharp teeth and flaked edges of locally available rocks (coarse sandstones and carbonates) to test how well these match.

The eyes both comprise four distinct actions, namely the hollowing out of the general area, the delineation of the rim, the excision of the eye surface, and the perforation of the iris. No traces remain of the initial material removal, and the rim was made by means of the incision technique described above. Its purpose is unclear unless it served to lodge sediment and emphasise the eye outline, which it performs admirably even today. This leaves two techniques to be discussed. The eyes were excised through either scraping/whittling with a point, or chiselling with a gouge, or both: the right eye harbours striated evidence of a perpendicular edge, whereas in left eye retains furrows of a ploughing point. Care was taken to ensure a resulting smooth surface with a gradual concave curvature. Two perforations are set therein, which give the impression of irises even though one is offset from the centre. While both are filled with dirt, enough surface is exposed in the dextral perforation to establish some variables (Figure A19, h-i). It is shallow, made using a rotary motion, and ends with a slight tip in the leading edge. Potential concentric striations are not observable due to adhering sediment. There is some similarity with the perforations in C 1401, 2157, given that the tool appears to be somewhat blunt and not set with a straight angled blade bit, yet here a definite small point is added to the puzzle. Possibilities remain *A. cervicornis*, a pointed tooth, or a sub-angular lithic asperity, used in hand-held motion.

Use and deposition

Evidence for the use of the *guaíza* narrows down to two residues and one wear trace pattern. First is the presence of tarry residues on the backside, and second the observation of a red and black residue on the forehead. The use wear trace pattern is predominant on the cheeks and sides.

The backside evidences remnant residues on the central area as well as the upper border ridge (Figure A19, j-l). These are viscous strands of a chunky yet grain-less black material that appears as a tar-like or (less probable) bituminous adhesive. The stratigraphy with the local sediment at El Cabo certifies the pre-excavation nature of these residues, and the utter absence of it on all other microscopically analysed objects from El Cabo (present study; Breukel 2013; Falci in prep.) strongly suggests a cultural source applied in the original life of the *guaíza*. The rim of the backside is also flatter and coloured dissimilarly to the remainder, though no wear traces were present. In all, prepared adhesion is a likely reconstruction.

The second residue occurs in even smaller quantities, adhering to the brow of the right eye and the forehead above it. The biggest concentration is interrupted by later striations, indicating the antiquity of the stuff (Figure A19, m). This is a red-brownish residue, going towards black in the concentrated centres, which has a grainy texture. It is somewhat similar to the reddish-black residue often encountered in axe hafts, there interpreted as an adhesive, but that type of residue is usually more viscose in appearance.

The wear trace pattern concerns a micropolish equivalent to that seen on C 1339 (but somewhat different from the inlays) (Figure A19, n). The contact is indicated to have been all around, soft and invasive, and was probably sustained over many episodes or long durations. The polish is well developed on the cheeks and the sides, especially the right side, and developing vestiges are found on the forehead, nose bridge, and chin. It was not found on the backside, despite that area also bearing a macroscopic golden-brown patina, indicating that this is not a good indicator when factoring in natural discolouration. Though the nature of the contact could not be ascertained before, the *guaíza* adds a good view on how its polishes are spatially distributed. The boundaries of the surface incisions carry it to a degree, and lose the association at the walls. Further the teeth and the sunken relief of the eye sockets are devoid of this polish, or any other use-sustained wear trace pattern. Notably, this absence suggests that these areas were covered in such a way as to avoid the relative motion of the contact event.

Regarding deposition, no damage or traces are seen that could reasonably account for its initiation. The depositional context itself has been regarded as a special association, possibly evidencing the intentional caching of this and other objects.

Object p001

This object was recovered in eastern Grenada by local people and subsequently became part of the Willcox family collection. Petitjean Roget (2015a, 150) tracks its context to the beach in front of the site of Pearls. However, it is unclear if this is accurate or merely reflects attempts of his contacts to 'legitimise' the find by associating it with the premier provenience for looted artefacts on Grenada. Since the iconographic decoration of p001 is typical Chicoid and the artefact type itself a Late Ceramic Age phenomenon, the attribution is probably to the second millennium AD.

Procurement and manufacture

The host shell is from the family Strombidae, likely *Strombus pugilis* cf. *Lobatus* sp. While only measuring 76 mm, the thick and well-developed shell indicates the specimen was adult or older, ruling out larger taxa such as *L. gigas* or *L. costatus* (cf. Petitjean Roget 2015b, 303-304). The specimen was likely collected in fresh state or shortly after death, as the surface shows no signs of older diagenesis. It is heavily modified, presenting a long and complex technical sequence of operation. Involved manufacturing processes include, roughly in sequential order, the removal of the apex, outer lip, and inner columella; opening up of the eye sockets; smoothening of the natural elevations on the upper surface; sculpture of the zygomatic and maxillary processes, as well as the canine jugum; engraving of the mouth and the curvilinear pattern; and placement of four functional perforations, one finished ornamental perforation and several more unfinished ones. At least five different techniques are necessary to complete these actions, being percussion, abrasion, drilling, incising, and chiselling, with a multitude of tools and applications evident.

Blank acquisition and the preliminary shaping of the piece relied upon percussion, probably direct outside and indirect inside as evidenced by the steady and controlled flow of the border (Figure A20, a, b). The internal ridges are smoothened over through later wear, which may include an abrasive technique and is certainly overlain by use friction. This pattern characterises the removal of both the outer lip and inner whorl. The removal of the apex most likely also occurred through percussion, given the presence of internal scars, and was succeeded by abrasive contact to smoothen over the edges (Figure A20, c). Experimental work in St. Vincent demonstrated the viability of *L. gigas* apex removal through pecking with an angular pebble. The shell structure was gradually pulverised down from the spire starting at the protoconch, during which no cracks radiated or other structural defects were formed. A technological alternative can be found in sawing (Velázquez Castro *et al.* 2006), but

Figure A20: A) organised breakage of inner columella and view of the upper whorl. B) view of lower whorl, smoothened over. C) top view. D) inside view of eye socket. E) view of a smoothened over prong structure. F & G) cut-marks and adjoining grooves across an excised space in the curvilinear design. H) view of the frontal teeth. I) view of the left lateral teeth. J) profile of lower perforation. K) profile of unfinished perforation. L) view of upper perforation with deformation. M) left lower perforation with abrasion facet. N) micrograph of wear polish, the directionality of which follows the first order lamellae.

no particular indications of this technique were found.

The eye sockets were also likely created using percussion in the preforming stage. The outlines are not fully circular but retain angles particularly in the upper lateral corners, which as seen in 726 may result from microstructure-induced crack propagation. Moreover, the internal surface retains jagging that has not been entirely smoothened out by subsequent actions (Figure A20, d). These later actions include potential sawing of asperities and thereafter abrasion to smoothen the rim and the boundary with the outer surface, producing an uninterrupted shape.

Abrasive action is clearly seen on several areas. In addition to the aforementioned instances, it was further applied to reduce the sculptured morphology of the outer shell to a smooth, level surface. This is most clearly visible in the case of the prongs, the removal of which has exposed an unusual wavy or curvilinear structure out of the surface (Figure A20, c, e). Its transitional design between the engraved patterns and the removed spire indicates that it was incorporated as a naturally decorative element of the shell. A few lines of crushing indicate that some percussive working was attempted but abandoned early on. No traces remain indicative of the specific abrasive technique(s), but the absence of coarser scratches renders a fine-grained, soft, or material with low asperity more likely.

The curvilinear design above the brow was engraved thereafter. It is composed of two horizontal wavering lines above the brow, the upper one adjoining to two spiral line patterns left and right of the centre. It is capped by a single line, which bears two downward facing triangles. This motif creates four excised circular elements, two smaller ones in the centre and above the centre and two large lateral circles. While some grooves are wider and shallow, individual cut-marks found laterally and inside the excised space display a clear V-shaped morphology and occasionally larger wall striations (Figure A20, f, g). This outline and the uninterrupted curvilinear flow are consistent with incision using a chipped lithic point, used to draw the motif. The width and shallowness is not attributed to later widening, but rather to a more angular gesture and dulling of the point. The lower laying areas of the central portion and groove joints were probably whittled or scraped out after incisions delineated them, since their surface texture remains relatively coarse.

On the lower area, the maxillary canines and zygomatic-brow aspects were excised first subsequent to which the teeth patterns were incised. The canines are bound by deeply sawn grooves, used to demarcate their morphology, and remnant sawing traces are also observed along the zygomatic aspects and brow ridges. Removal of the shell in between is unspecified, possibly chiselled, but is capped by abrasive contact to smoothen out the aspects for the three engraved teeth patterns (Figure A20, h, i). Thereafter horizontal grooves separating the upper and lower jaw were each incised with two or three motions, interrupted by a total of 13 vertical single V-shaped cut-marks. No widening is observed here, and all grooves are devoid of microstriations or polish irrespective of their location.

Finally, perforation techniques were used to drill four lateral, one central, and four unfinished perforations. The lateral perforations are all circular and asymmetrically biconical with a less deep inside (Figure A20, j). They are characteristic of a lithic drill bit and their regularity suggests a rotary device. The deeper central perforation designates the nose and is conical with a corresponding scarred exit point. The stepped outline indicates an irregularly shaped solid bit such as a thicker flaked lithic drill, although the deepest step is smaller than the outline of the lateral perforations. The unfinished decorative perforations are shallow cups that would be more consistent with a handheld blunter material, although no suggestions can be given (Figure A20, k). They bear no traces or striations, and probably appeared after incision or demarcation of the other elements given their centrality in the motif.

Use and deposition

*E*vidence for use relates to string wear on the upper lateral perforations, a contact polish covering the back rims, and a contact polish affecting most of the upper lying frontal surface. String wear is heavily developed on the upper lateral perforations, indicating an extensive duration of suspension (though its weight likely increases the rate of development). This is particularly prevalent on the left side (Figure A20, l), where the deformation is mirrored indicating the knot was twisted around the open ridge. The deformation is less pronounced on the right side, while associated potential wear polishes have not survived on either side. Altogether, the upper perforations were tied to a knotting system from where the shell face was suspended. There is evidence that the lower perforations were strung as well, in the form of minor deformation and an abrasive facet on the lower left perforation (Figure A20, m). Such traces are indicative of bead-on-bead wear (sustained contact between adjacent elements on a string). Thus, they indicate that the object fastened a second string that fulfilled a different purpose within a larger composite artefact. However, the lower perforations were clearly not loadbearing as they did not develop wear to the same degree as the upper ones. Wear development is also asymmetrically located on the left side, suggesting the attachment was somewhat out of balance.

Previously, contact friction was observed on the backside of the ridges overlaying manufacturing wear that indicated contact against another surface. This is locationally different from the glossy brown patina covering all protruding surfaces on the various frontal aspects, but is otherwise microscopically equivalent. The polish has a rough, dull, and greasy texture and is invasive while lacking abrasive action, further having developed over large swaths of the surface in various degrees of connection (Figure A20, n). However, it is not as soft and grainy as the typical polish found in the El Cabo shellwork, having rather irregularly jutting asperities and smoother reticulation running over it. The polish is only marginally present in the excised areas, suggesting that the contact was pliable enough to reach in there but of larger nature that could not really affect these areas. Similar to before, a range of soft contact materials is attributed to the formation of this trace. It is suggestive of actual hide or of plantish contact rather than handling by human skin, but experimental reference needs to be established to this end.

Residues were present on the artefact, but their relation to the pre-modern biography is uncertain. An interrupted stripe of grainy black residue is located above the right zygomatic, which appears to be relatively fresh. In its vicinity are a few spots of bounded green-orange residue with a resinous texture, of unclear origin. It superficially resembles the residue found on C 1339 and C 3107, though it appears fresher than either of those. Given the inability to examine those areas under higher magnifications, neither residue is considered further.

There are no contextual data that permit an inference to the depositional act. Although the artefact is broken in two places, neither event carries an implied relation to its death. The first is the nose bridge in between the eyes which is lacking, joining together the goggle. This is not a debilitating break, and since minor rounding is seen on the breakage plane, it probably did not coincide with the termination of the use phase. The second break is on the right lateral side below the teeth, where part of the columella has been torn out of. By comparison this must have taken place at a later point in the life of the *guaíza*, and some areas of it may have broken further in recent times.

A4.2 Dental objects

Element S615

This object was recovered from the top layer of test pit A, which is a midden layer in closed association with Cayo style pottery indicating a probable early colonial period date.

Procurement and manufacture

The tooth is identified as the canine of a pantherine species, of which the only New World member is the jaguar. This has been verified by recent collagen fingerprinting conducted by M. Buckley at Manchester university, publication of which is forthcoming (J. Laffoon, pers. comm. 2018). The natural range of this species is widely across the South America, and an origin on the mainland of this continent is backed by the isotopic signature of the pendant (Laffoon n.d., in Boomert *et al.* 2015; Laffoon *et al.* forthc.). Though much South American fauna also ranges the continental island of Trinidad, there is no evidence whatsoever that jaguars inhabited this island in historical times (Boomert, pers. comm. 2018).

Regarding procurement technology, there is no clear evidence from the technological traces on how and at what point the tooth was removed from its original socket. Indeed, it cannot be equivocally claimed that it was still embedded in the jaw of the animal at the time or procurement to begin with, though it seems likely (below). There are three parallel cut-marks present located on the apicolabial aspect in oblique direction, in association with the perforation (Figure A21, a). These may relate to the cutting of ligaments and alveolar bony tissue in which case they indicate the tooth was cut loose from the animal jaw at some point before full decomposition of the soft tissue, but there is a competing interpretation that relates to activities during the life of the object (below). More pertinent are numerous long axial striations on the lingual and distal (brown coloured) aspects, which run from the apical point to crossing the cementoenamel junction. Many of these are somewhat overlain by the extensive smoothening on the apical sides indicating that they occurred relatively early in the life phase (Figure A21, e). Given this overlaying and gradually erasure on the apical aspect, a relation to manufacture is likely. The most probable correlation is scraping with an asperite edge to clean off the cementum from the dentine, though it is unclear what tool material. The shape of the root does not seem to be anthropogenically remodelled otherwise.

The perforation is located near the apical tip and along the mesiodistal axis. It sports a subtle connecting ridge on the inside and is thus biconical in nature. However, the perforation is heavily worn and the 'cones' approximate the shape of two U's meeting in the middle. This implies the use of a drill with a solid bit, with the size of the perforation (4mm diameters each) placing constraints on the dimensions of the tool. No traces of technological wear remain that could indicate a particular type of contact material. A comparison with the experimental materials in section 5.3.3 indicates that the outline of this perforation could be obtained by drilling with a tooth, but also by a brittle lithic followed by heavy internal wear. Given that such heavy wear is observed, there are likely also numerous other options that would eventually come to approximate the present morphology.

Use and deposition

The object displays several traces of use, notably signs of wear concentrated on the perforation, rounding and contact facets on the apical tip, and general wear on the surface of the root.

The brown side perforation is deformed, most pronounced towards the lingual side, but does not

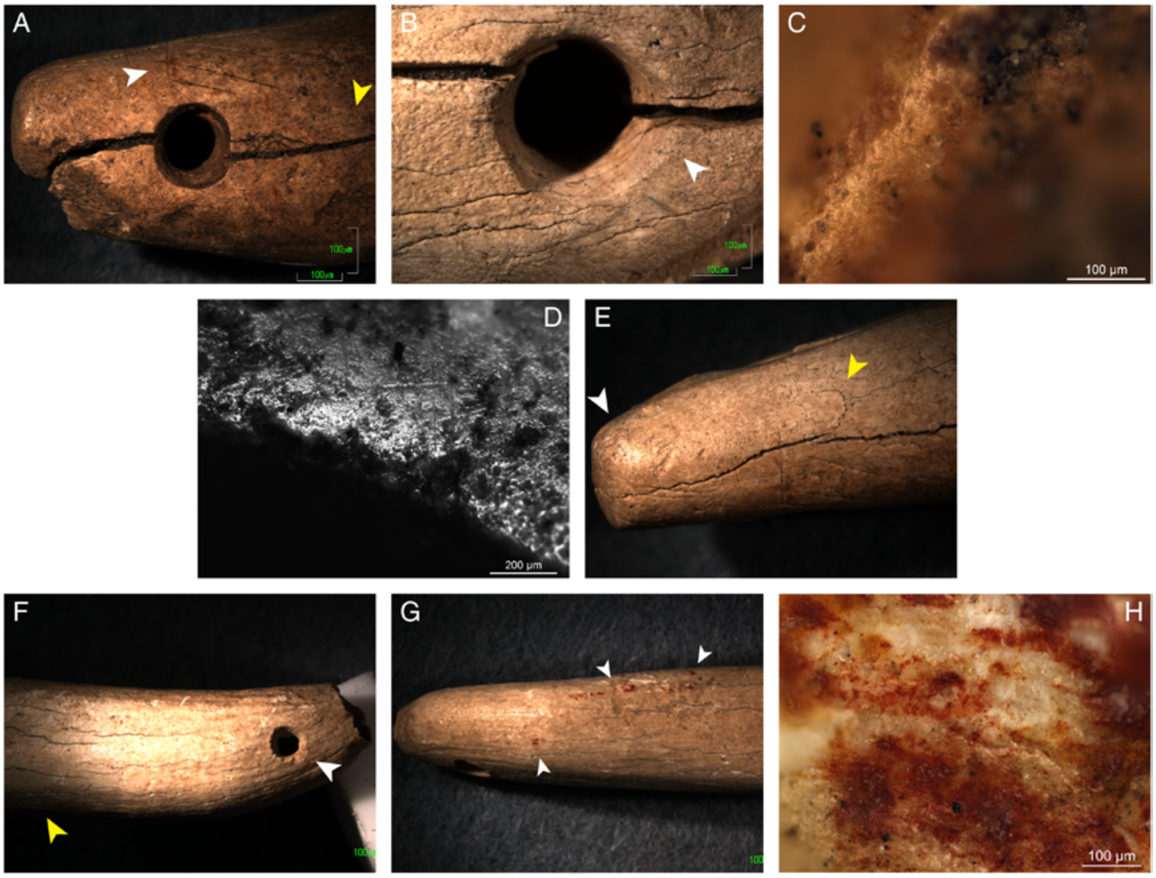

Figure A21: Micrographs of S615 and S208 (yellow scalebars are erroneous). A) profile of brown-side perforation on element S615. Note three parallel cut-marks located above it (white arrow), the abraded facet against the worn apical tip, and heavily worn axial striations from the perforation onwards (yellow arrow). B) profile of white-side perforation on element S615. Note axial wear facet (white arrow). C) dense band of polish located on the otherwise sharp rim of perforation on A21-a. D) microtopography of the rim of perforation on A21-b. E) Lingual view of the apical tip of element S615. Note severe rounding of the tip (white arrow) and smoothening of the striations at the height of the perforations (yellow arrow). F) mesial/distal view of element S208. Note wear facet on the rim of perforation (white arrow) and axial striations (yellow arrow). G & H) stereograph and cross-polarised micrograph of pigment deposits on S208 (white arrows).

have worn facets gradually entering it. Instead the rim of perforation is fairly sharp and characterised by a thin band of densely packed invasive polish structures (Figure A21, a, c). Conversely, the white-side perforation shows rounding of the rim of perforation and inclines towards facets, with a smoothly worn patch towards the lingual side and deformation in apical direction. The microtopography is characterised by a rough and bright polish with frequent striations that does not change noticeably towards the rim (Figure A21, b, d). The overall effect is dramatically different from the brown side perforation and suggests an asymmetrical attachment system or a succession of systems. The alternative explanation for the cut-marks previously mentioned also has to do with a potential succession of attachment systems. These anyhow reflect activities serving to cut loose extraneous material, and if not a part of procurement then this extraneous material had been applied to the root subsequent to it having been taken out of the socket. The cut-mark edges appear slightly worn, indicating that it represents an activity prior to the final stage of suspension. One potential mode is that of a tightly strung band forming a larger composition, such as a bracelet, headband, or apron, another is that of a string-based composition such as a necklace in which the individual teeth are fastened in knots (Falci *et al.* 2018). The gross weight of the canine ensures enough pull so as to explain the heavy rounding even within a confined space of movement.

This does not yet explain the different wear profiles of each perforation, but I will get to this in conjunction with the other observed traces of wear. The rounding and overall gloss on the apical tip are in fact consistent with that part of the root being in sustained contact with another medium, but a cave-at is required here. The rounding overlays the sharp angled labial facet that is present on the apical tip (Figure A21, a), which indicates this facet formed previous to that point. It could be technological in nature, but no obvious traces were noted during the analysis; the most likely interaction therefore is sustained bead-on-bead wear with adjacent elements in the configuration. This implies a relative freedom of movement that contrasts the woven band mode of attachment, and it is also unlikely to be congruous with particular knot bindings. Rather, it appears more congruent with a separate, preceding episode of wear (as suspension or manufacture). Finally, there is also some degree of smoothening of the microtopography intermediate on the tooth, and a few of the axial striations noted above are fresher than others. Rather than scraping in manufacture, these may instead relate to use contact with abrasive materials within the composition itself, such as siliceous fibres or strings treated with mineral-based pigments. The current level of documentation makes it difficult to reconstruct, however, so the piece should be revisited in order to better distinguish this hypothesis.

With respect to deposition, there are no critical indicators that would suggest discard after a loss of functionality. A 'non-critical' indicator could be the cracking observed, perhaps relating to threatening or uncontrollable non-human agencies, but such is at this point mere speculation. As noted, slight wear on the edges of the cut-marks was taken to precede later use, though it is also possible that this represents an act of deposition and the wear is taphonomical. Given the provenience of an upper midden layer in an eroding coastal site, I hesitate to attach too much inference to the phase of deposition, other than the notion that the biography is closed.

Element S208

This object was recovered from the surface near test pit A, an area with dense deposits of Cayo pottery both on and below the surface, indicating a cultural association and date coeval with element S615.

Procurement and manufacture

The tooth is identified as a Sus scrofa incisor via the same means of collagen fingerprinting applied to S615. Isotopic analysis returned results originally thought consistent with an origin in northern South America, similar to the previous pendant. Potential locations matching the results include eastern coastal Venezuela, northwestern South America, Central America, and the Lesser Antilles (Laffoon n.d., in Boomert *et al.* 2015; Laffoon *et al.* forthc.), which at the time suggested a mainland origin since the tooth was thought to be of a peccary (*Tayassu* sp.). Though Europeans only officially settled the Lesser Antilles at the beginning of the early 17th century, Watts (1987, 107, 110, 117, 156) writes that the Spanish had already left populations of wild hogs to breed on most of these islands early in the 16th century. This renders them for all intents and purposes also a native resource in early colonial times, and would remain consistent with the returned isotope values. No indications of specific procurement practices were observed on this tooth. As with element S615, there are very faint elongated striations on the longitudinal axis on this piece, primarily on the mesial and distal aspects. These may indicate similar scraping, but given the more advanced erosion of the surface this can at the moment not be substantiated.

The two perforations are located near the apical tip and along the mesiodistal axis, with 1mm diameters. Their profiles are conical to cylindrical with a strong onset, of which the edges have a ragged appearance. Given the size of the pulp cavity the actual depths of perforation remains quite shallow, and these do not meet in the centre as a result. The state of weathering in conjunction with probable use wear have since erased all traces of manufacture. The profiles suggest a rotary motion but no clear indications of specific technologies or bit materials, nor for potential successive widening, although their dimensions (1mm each) are minute when compared to every other perforated material studied in this work.

Use and deposition

The objects displays some markers of wear, including suspension and contact with a pigmented surface, but the mode of use remains ultimately unclear. With respect to the depositional event the context is inconclusive similarly to element S615.

The rims of both perforations are ragged, which could be consistent with wear depicted as from fixed attachments (Falci *et al.* 2018) but also of certain perforation techniques. On the distal side the perforation displays a restricted facet towards the labio-apical axis from wear (Figure A21, f), or less likely breakage, whereas none is on the opposing side. Both perforations display some signs of internal deformation into the direction of that axis, but here the angle is unclear as it may relate to plastic deformation from the drill bit punching through the shallow dentine wall. From the perforation towards the apice the surface microtopography is somewhat smoothened and displays some small pits, akin to the worn surface of element S615, but on the whole less convincing. If all of these signs indeed relate to use then this surface is differential from the other areas surrounding the perforation, arguing against bead-on-bead contact. Thus, they might indicate a thin string passing once or twice and subsequently winding or being knotted around the apical tip, with the teeth otherwise in (partial) contact with a coated surface (below). However, the state of weathering does not permit the current analysis to substantiate a reconstruction to that degree.

A notable observation is the presence of a strip of small, interrupted residue deposits, intermediate on the labial dentine and oriented along the long axis (Figure A21, g-h). These deposits consist of very small red grains intermixed with black viscose clumps, and are interpreted as a red pigment. If these residues originated from a coating of the pendant their spread would be expected to be more random, and perhaps concentrated in surface depressions; a similar distribution would be expected for a wrapping coated in pigment. Therefore, the orientation of the residues renders more likely suggestions of the tooth resting with the labial aspect on a pigmented surface, such as cloth or body-painted skin.

Object FL 1748

This artefact was recovered from Unit 32 at El Flaco, one of a set of three 2x2 pits west of the primary mounds in the excavation. Its precise stratigraphic context is Feature 82-13, of which no specific cultural information is currently known to me.

Procurement and manufacture

If the identification of *Trichechus manatus* is correct, then the tooth is of maritime origin. Potential traces indicative of procurement practices would be located on the root, which is missing. There were no traces observed that explicitly affirmed further shaping, although this cannot be ruled out. The incisal edge was rounded flat and may have been modified artificially, though comparisons with reference materials are necessary to assess this option. The inner surface is completely unobservable due to adhering soil, which could not be removed.

The perforations have biconical profiles that were first initiated from the labial aspect, and met by secondary (smaller) cones initiated from the inner lingual surface (Figure A22, a). This perforation profile is common for drilling techniques utilising a brittle lithic bit, though other types of solid tips may create similar outlines. It is not indicative of a hollow drill or a soft organic tip, since these use abrasives to create (near-)cylindrical outlines. No microscopic traces were preserved that could aid further interpretation of the drilling material, due to combined erosion and heavy wear from use.

Use and deposition

Observable wear from use is restricted to the perforations, and is characterisable primarily due to the full view on the inner walls. All four rims of the perforations are severely deformed. The two exiting on the labial (frontal) view are worn most strongly towards a distal point of the centre, now missing, but are rounded overall (Figure A22, b). The two perforations exiting the lingual (inner) aspect are less strongly deformed towards a particular coordinate, but very rounded overall. Potential ridges once located where the leading edges from either conical perforation met are completely erased; the inner surfaces of the perforations (incisal quadrant) are both characterised by a dense cover of polish, which moreover bears heavy longitudinal striations. Together, the combined evidence indicates that the pendant was strung with a flexible material. Beyond that, the string was either moving freely but gravitating towards the broken centre (more congruent with the rounding in all directions), or

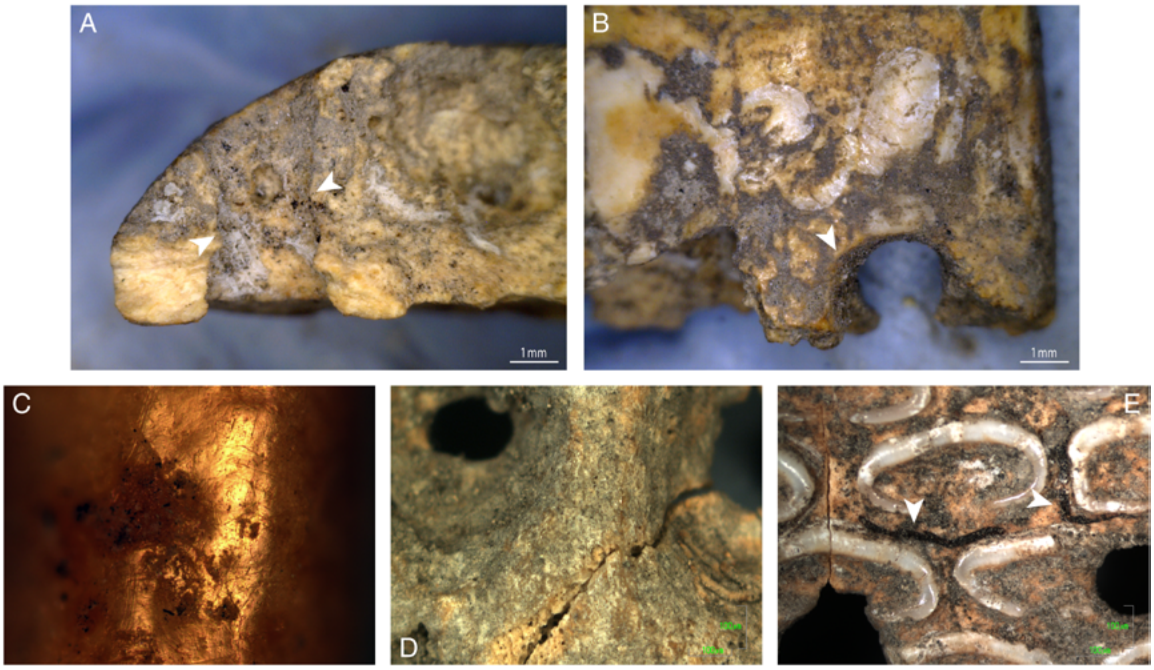

Figure A22: A) distal view of the right perforation on FL 1748. White arrows indicate the biconical constriction. B) labial view of the left perforation on FL 1748. C) striated surface from the lateral side on FL 023 (full width micrograph at 70× magnification). D) external view of the left perforation on FL 023. E) internal view of the perforations on FL 023.

tightened towards the area of breakage by knotting (more congruent with the observed direction in the labial perforation rims). Since the distal portion is missing, any certainty is precluded. It does seem logical to assume that the pendant fractured at the weakened use area under endured stress at some point, and was discarded as a result thereof.

Object FL 023

The artefact was recovered from Unit 1, Layer 5. This is probably one of the artefact-containing lenses within the mound, associated with relatively high concentration of ceramics.

Procurement and manufacture

The specific raw material is the lower pharyngeal grinder from a member of the parrotfish family (Scaridae), as identified by dr. A.T. Antczak. Such bones normally possess large lateral processes for muscular attachment, which are not present in this specimen. It is possible that these had been removed by a manufacturing process such as sawing or breaking followed by abrasion, but potential traces of wear have not been observed. Rather, the lateral sides display a glossy ridge worn from use (Figure A22, c), adjacent to an irregular groove and topography that in macroscopic view appear natural. Adhering soil prevented microscopic analysis of these lower areas. The distal end (near the perforations) appears to have been shaped through a careful breaking away of bone between the worn enamel ridges.

The pendant contains two perforations near the distal end. They are roughly parallel to the lateral axis, but off-set in relation to each other. They consist of very wide cones from the back of the pendant that narrowly penetrate the pendant but at different degrees (Figure A22, d). It is unclear if a brief onset was used to widen the opening from the front side due to wear and erosion. The drilling material penetrated the enamel ridges well and was probably a large lithic flake.

Use and deposition

Observable traces of wear were restricted to the rims of perforation, which is foremost a factor of the state of preservation and cleaning. Both rims are deformed along a continuous axis, consistent with a single string passing through and exiting on the backside. There are no traces that would evidence more complex looping or knotting around the piece. Some strands of a black material are present between the perforations, but it is unclear what it consists of (Figure A22, e). The sides contain multi-directional striations that may be related to use (Figure A22, c), implying freedom of movement, but it cannot be ruled out that part are taphonomic alterations. The condition of the teeth is natural.

Since the fracture is of recent origin, it is unclear why the pendant was discarded. The damage in the left perforation that initiated the recent fracture is probably ancient, since its degree of erosion is consistent with the other surface. Still, that would not prevent its wearing and would be partially obscured by the string.

Object C 2420

The context of C 2420 is unclear as a result of mix-ups during an exhibition. It is indicated to originate from the habitation palimpsest, somewhere near ZSs 85-50-03 which contains early Chicoid structures associated with House Trajectory 3. This specimen was not studied under high magnification due to time limits.

Procurement and manufacture

The pendant is made from the dentary palate of a species from the Myliobatoidei suborder (the stingrays). No traces remain with respect to the techniques of procurement and early manufacture. These have all been erased by the subsequent application of an abrasive technique used to level the surface. All six sides are abraded flat and they display relatively sharp angles against one another, only somewhat rounded as a result of later wear (Figure A23, a). The surface displays some gloss, but since I performed no high magnification analysis, the origins of this gloss (natural or artificial) and the abrasive technique itself cannot be further interpreted.

The two perforations are biconical and made using the same technique, for the most part initiated from the currently dark-coloured surface. They are met with a brief entry from the currently bleached surface. The former initiations display concentric grooves from the displacement of material (Figure A23, b), which together with the biconical outline suggests a solid, uneven drill bit such as a lithic micro-flake used in a rotary motion. One was drilled slightly further resulting in the removal of most of the inner ridge, and consequently a larger appearance.

Use and deposition

The perforation areas display the main evidence with respect to use. All perforation rims display wear and deformation. On the bleached areas, the wear connects the two perforations thereby evidencing that part of a string was suspended in this area (Figure A23, c). A similar facet exists on the opposing (dark-coloured) side, but it is not as well developed Figure A23, b). Deformation of the perforations themselves is light but present, and appears to be oriented towards the upper side. The most parsimonious explanation is that the string wound around the area bridging the perforations once or twice, and was either simply suspended or also wound around the upper side. Finally, prolonged use contact is indicated by the general rounding of the pendant, both near the sharply abraded borders between sides and of the flat topography. There is no specific cause of death to be inferred from the integrity of the artefact, and the contextual uncertainty precludes speculation such as for the shell inlays.

Object FL 115

The object was recovered from the fill of Feature 74-01 at the 2013 season of El Flaco, which is located at the edge of habitation platform 2.

Figure A23: Manufacturing techniques on C 2420. A) abrasion planes. B) Perforations seen from the dark-coloured surface. C) perforations seen from the bleached side. Arrowheads indicate the facets of wear departing from the perforations and meeting in the middle of the connecting bridge.

Procurement and manufacture

The pendant is made from the dentary palate of a species from the Myliobatoidei suborder (the stingrays). Such palates are typically large and connected to the bones of the jaw. Nevertheless, no traces were identified that pertained to the techniques of procurement and of detachment from that bony structure. It is possible that the palate is mostly automorphic, but given the lack of reference material this cannot be stated with absolute certainty. The only clear evidence of shaping pertains to a parallel depression located in between the perforations and the centre of the piece. The surface is heavily eroded as a probable result of use, and no original technique can be reconstructed.

The object contains two perforations in parallel line to the lateral sides. These are of biconical outline and made using the same technique. The primary drilling occurred from the smooth occlusal surface and is fairly deep, met by a short onset from the opposing surface (Figure A24, a). Initial cuts may have been made on the smooth surface first, resulting in the current depression, but this may also be the result of spalling during the drilling process. A few areas within the rim of perforation display concentric striations. These range from small striations to clusters thereof interlaced with ridges in the topography (Figure A24, b), clearly indicating a drill bit with hard, irregularly sized asperities. The wear is entirely consistent with a micro-drill bit of flint or related material. The strong parallel alignment of the concentric striations suggests a mechanical drilling method (bow drill or pump drill) over hand drilling (and perhaps palm drilling), but the perforation surface is too degraded and obstructed to make a definite assessment of the regularity (Bains 2012).

Use and deposition

The perforations on the pendant do not display much wear on the insides, but there is comparatively more 'polish' on the rims of perforation and the bridge between them, than elsewhere on the surface of the artefact. Still, it is unclear if this pertains to the cultural biography: parts of the surface of the artefact retain the original outer layer, which is fairly smooth, glossy, and covered in multidirectional striations that could originate easily from natural wear in life or taphonomically (Figure A24, c).

More notable is the yellowish band of erosion that exits from the occlusal perforations, runs in diagonal direction over the lateral sides with a consistent width of 6 mm, and meets in the parallel depression on the opposing surface (Figure A24, d). The topography is very rounded and heavily pitted in this depression; less heavily eroded surfaces also occur on either distal surface of the pendant. It suggests a chemical reaction spatially restricted to these parts of the pendant, and therefore a differential coverage of the pendant. Given the association with the little worn perforations, a possible

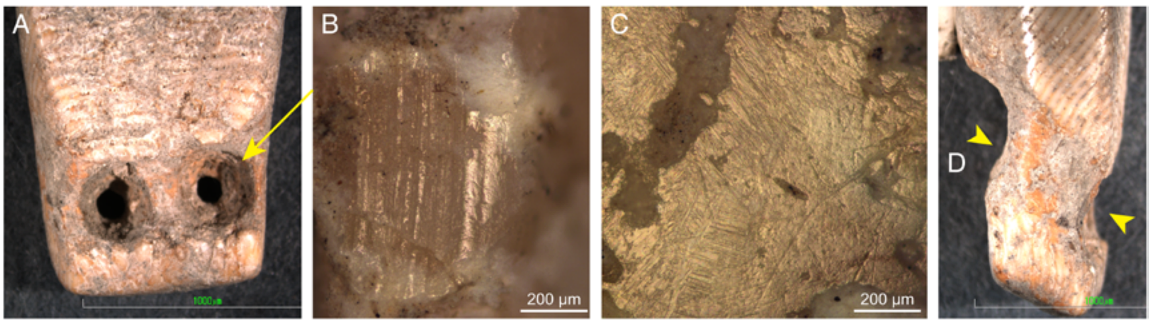

Figure A24: A) Dual perforations on FL 115, occlusal surface. B) striations from drilling in the perforation, location indicated by yellow arrow. C) view of the rough but glossy natural outer layer with striations in multiple directions, including a central band of parallel grooves that is not in association with morphological features. D) diagonal band of discoloured erosion.

reconstruction would be a series of tightly woven circumferential loops that pass the perforations but do not rely on them for tightness. The strings were probably not erosive themselves since the perforation walls and rims are not strongly affected, but will have trapped an erosive agent instead. However, the confidence is low for any reconstruction owing to the damage the surface had sustained.

There are no indications for a specific depositional event.

Object Lup 090

The object – identified as an earplug – originates in the site of La Luperona, dated from the 13th to 15th century (Hofman and Hoogland 2015b), and derives from Layer 1 in Unit 4 (64-16-08). It is associated with Meillacoid style ceramics. Earplugs of various styles in bone, shell, stone, wood, and pottery are also known from Playa Grande, in association with the mixed ceramic content of that site (López Belando 2013), El Cabo (personal observation), and various sites in the northern Dominican Republic (Falci 2015c).

Procurement and manufacture

The object is evidently made out of an osseous element, but it is not clear of what animal. The solid morphology and tissue exclude native insular terrestrial animals, indicating a maritime origin. One potential association is the bony bill of a marlin (family Istiophoridae – A.T. Antczak, pers comm 2014), another the second distal phalange of a marine turtle (superfamily Chelonioidea – G. Shev, pers. comm 2018). The fairly gradual transition between cancellous and compact tissue has been proposed as a diagnostic element of Cetacean bone elsewhere (Margaris 2014). The element was logically obtained by means of a coastal or maritime expedition, but lacking a good identification little can be stated on the techniques of procurement. The issue is compounded by the fact that the original morphology is unknown and altered.

That said, the shaping strategy is not entirely clear. Parts of the side retain coarse striations that are either oriented parallel with the longitudinal axis, or multidirectional (Figure A25, d). These traces appear to relate to an abrasive wear process since there are no modelled processes that would produce them through wear. The earplug could have been shaped through scraping with a coarse-grained edge or abrading against a coarse-grained platform, probably the former. However, since the surface is fairly worn from later use this interpretation is not definitive.

The angle between head and the sides of the earplug is sharp (Figure A25, b, e), but no clear traces remain of the removal operation. Groove-and-snap is a hypothetical option, as it is a commonly used technique in the area (Falci 2015c). Otherwise, the method of potential levelling for the head is unsure. Abrasive smoothening would be logical as it would wear down all previous traces of manufacture, but there is no evidence for it, given that the topography is not entirely flattened, and striations are absent in this area (Figure A25, a).

Use and deposition

The surface is quite worn overall, and the absence of recognisable manufacturing traces in these areas points towards extensive use processes and/or PDSM on the object. Stereoscopically, this wear is mild directly behind the head, becomes strongest around a circumferential depression located about one-third down from the head, and is reasonably well developed on the remaining two-thirds down towards the tip. The topography is smoothened and bears an oily gloss, which correlates to

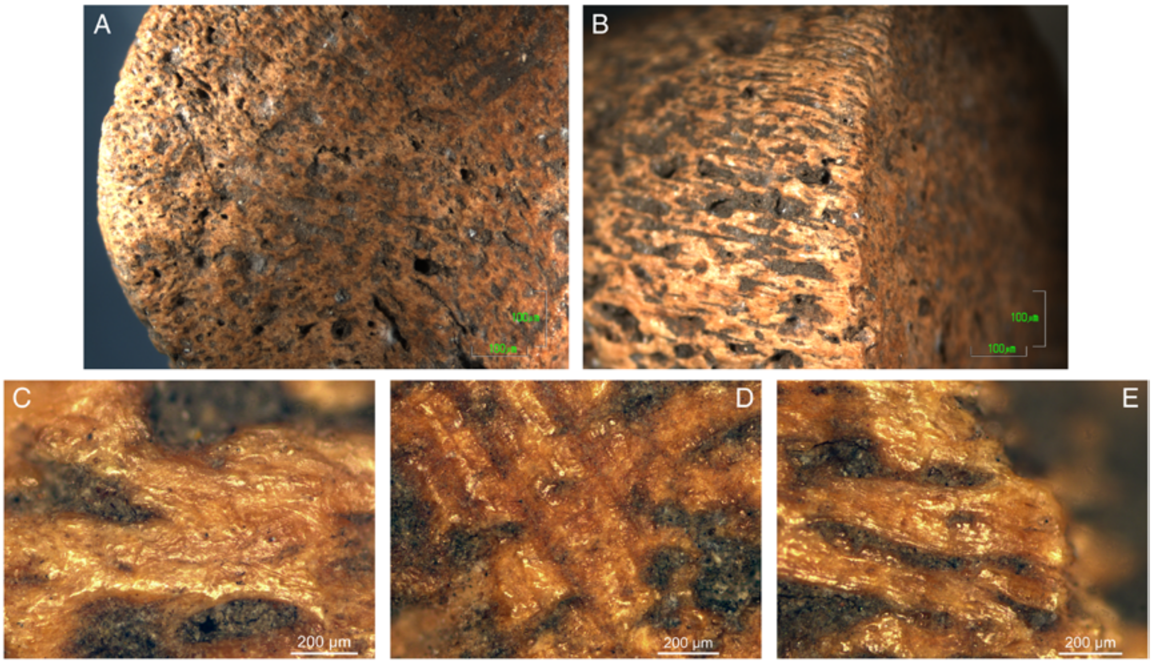

Figure A25: A) view of the rough surface texture on the head. B) view of the angle between head and side, and some smoothening on the latter aspect. C) microwear polishes near the circumferential depression as described in the text. D) micrograph of coarse crossing striations near the angle between side and head. E) close-up of A25-b.

bright microwear polish structures with a greasy texture that is consistent throughout but differs in intensity (Figure A25, c). There are no signs of abrasive contact from a hard medium in this contact, but the polishes may have degraded taphonomically. Concerning the flat surface of the head, the aforementioned polishes appear to dive over the edge of the side into that area, but come to an abrupt end; the head itself is virtually devoid of contact polishes.

Based on the distribution this set of traces is probably associated with wear from use, logically indicating an insertion into a soft medium from the tip onwards with higher tension existing the thicker the circumference becomes. In turn, this would be consistent with the morphology-based identification in the field of the object being an earplug. However, the analysis is best considered inconclusive since the tip is missing. Any competing interpretations, such as an awl-like tool, would have that area be the active use zone and it is now not knowable if the traces on it would be different in kind. It seems probable that this break lead to the deposition of the object, it no longer suitable for either mode of use, but it would have been easily repairable from a technological point of view.

A4.3 Bone objects

Object LP-01

LP-01 is currently in the collection of D. Charles, who reported finding the flute laying loosely on the beachside, having eroded out of the cliffside after storm events. The sediments still within the objects indeed correspond to the deeper stratigraphy of the cliffside (M.L.P. Hoogland, pers. comm. 2017). Little sediment currently remains, as the object has been thoroughly cleaned. This provenience would associate the flute with the disposition of waste over the cliffside, typical for Cayo habitation sites.

Procurement and manufacture

The pipe is manufactured out of a long bone diaphysis now measuring 203 mm in length and 27 mm in maximum width. The long bone has been identified as the femur of a brocket deer (*Mazama* sp.), which includes northern South America in the native range (G. Shev and Z. Ali, pers. comm. 2019). *Mazama americana* occurs in Trinidad and formerly in Tobago, but no large mammals occur naturally within Grenada. Three main manufacturing stages are observed: initial shaping, abrading, and execution of features. The first essentially pertains to the removal of the epiphyses from the bone at large. The mouthpiece flares outward with thinner bone, whereas the foot was dislocated at the metaphysis. There is strong evidence that epiphysis removal was done by sawing with a solid lithic: the outer circumferences are slightly inflected evidencing the remnant groove (Figure A26, a) and there are several onset scratches, including one misplaced cut-mark. A fine circumferential soil-filled groove near the foot is possibly ornamental (see LP-02).

Abrasion stigma are observed on a few areas on the flute, ostensibly to erase tuberosities, crests, and other rugose sites for muscle attachment from the shaft. As it is, the outer surface is smooth and devoid of naturally rough features, and the combination of erosion and use rounding has removed any obvious signs of the prior processes involved. Still, in some place abrasive traces remain on the microtopography in the form of small clustered striations underneath later modifications (Figure A26, f). The preservation allows no commentaries with respect to the technology and gesture used, other than on the relatively fine-grained nature thereof. The inner surface (the medullary cavity) also appears to have been modified through abrasion. This is best captured closer to the openings (Figure

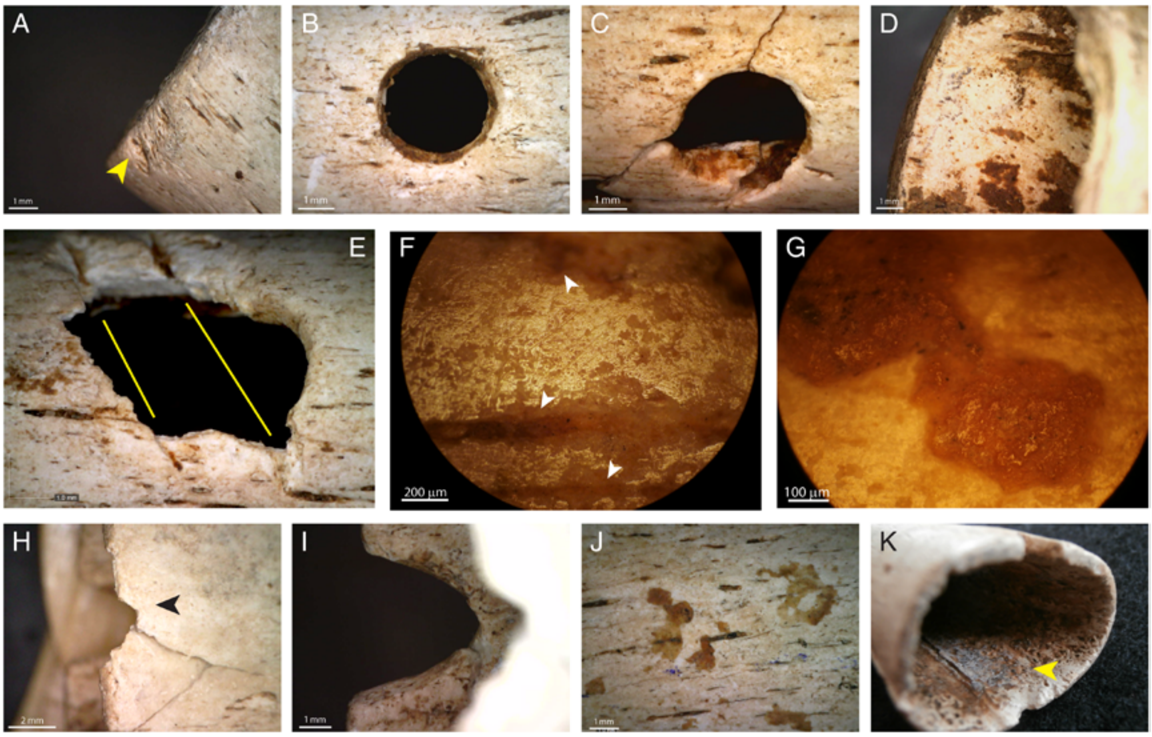

Figure A26: Manufacturing and wear marks on LP-01. A) remnant of an onset to a groove. B) intact tone hole perforation. C) damaged tone hole, internal view. D) internally smoothened surface. E) destroyed tone hole, with motion indicated. F) deep striations amidst a detailed view of the micro-topography. G) high magnification view of red-orange residue. H) break mirroring the V-shaped notch (arrow) and lavish use of glue. I) Internal view of the V-shaped notch. J) low magnification view of the red-orange residue with superimposed soil remains. K) greyish residue of uncertain association.

A26, d), but smooth reflections can be viewed deep within by through-sighting the flute against a bright light source with the naked eye. All of the spongy bone of the medullary cavity has been removed, and possibly parts of the compact bone as well. However, to what extent this was done cannot be established due to the unavailability of reference material. Medullary cavities are expected to be properly hollow for most of the length, but also to contract towards the epiphyses rather than expand as in the present materials. Given the inability to properly examine these unreachable surfaces, the techniques used can only be speculated upon. Possible options include the use of a thin stiff rod to break away spongy matter, and a flexible strip or string with abrasives to smoothen away remaining irregularities affecting the tonal resonance.

Thereafter, the features of the tone holes and mouthpiece were made. Three perforations provide the flute with tone holes, regularly spaced from one another (17.5mm ± 0.5mm). One is intact, the other two display damage (Figure A26, b-c). A rotary drill is clearly implied in the concentric circumference, but the thin bone makes it difficult to observe markers left by different types of bits. Still, the perforation wall is nearly straight but for a minor inflection, not completely worn away with the presumed constant finger action steadily smoothening these areas (cf. d'Errico 1993). The morphology rules out a lithic tool. It is comparable to the animal tooth experiment, but could also be obtained by using tubular bits. The lack of a perforation profile excludes certainty of identification. The damaged perforation was described as identical to the first perforation before the flute broke at the circumference (D. Charles, pers. comm. 2016), and is internally consistent with it. What remains of the ruined perforation also matches the pattern, but this tone hole was deliberately destroyed with two deep incisions breaking away the bone (Figure A26, e).

The flared end forms the mouthpiece, displaying a broad V-shaped notch with smooth curving bottom. The bottom is indented and the groove itself mirrored by a breakage intrusion on the opposing end, which are discussed below. The cross-section matches very well with the experimental wood-widened groove, including the slight outward abrasive facet, and is thus likely the result of a similar technological process (creating an onset with hard material and widening it with a softer tool). This feature is a defining characteristic of notched end-blown flute mouthpieces (alternatively called *quenas*).

Use and deposition

The use and deposition of this flute remains a bit vague, given its not entirely certain provenience and its spotty recent itinerary. It is riddled with gloss and residues of all sorts, most of which are clearly recent in nature or must be dismissed as inconclusive. The most frequently used areas would obviously be the tone holes and the mouth piece, but nevertheless, there are no clear traces of contact observed in these areas. It is plausible that the advanced state of erosion of the microtopography in conjunction with subsequent paper wrapping have erased all interpretable traces from skin contact, a type of wear that is slow to develop to begin with. Nevertheless, it remains problematic.

The best evidence that the flute was used to play music pertains to the notched mouthpiece aperture. As mentioned, here is a wide V-shaped groove with rounded bottom, indented, and mirrored on the opposing end by rough triangular chipping of the edge (Figure A26, h-i). The damage deforms previous features of manufacture, and must indicate a conventional activity since it is observed in the other flutes as well. The fracture propagation indicates that a pressuring force was directed inwards on both sides, coming from an angle. This pattern appears to be consistent with notched end-blown flute use, in which the notch forms the blowing edge against which the airflow must be directed to produce sound. Like modern musicians, Amerindians are described and depicted to balance end-blown flutes and maintain their sound by pressuring the mouthpiece against their lower lips, sometimes indirectly positioned against the teeth (Figure A27, cf. Aretz 1991; Bianchi 1982, 183; Hernández and Fuentes 1985, 28; Izikowitz 1935, 305; Koch-Grünberg 1921, 192). Such pressure is predicted over time to produce the centred, minor, and inwardly directed fracture seen in the archaeological piece. It does not explain the minor wear seen within the notch itself, but rounding and grease forming on the mouthpiece is to be expected for flutes in general (Miguez *et al.* 2013).

Figure A27: Figure 167 from Izikowitz (1935, 305) depicting a typical position for playing edge-blown notched flutes.

Mentioned above, the proximal perforation is fractured beyond usability by two parallel adjacent cut-marks. The cut-marks are deep and pronounced V's with narrow bottoms, set using a solid straight-edged tool (Figure A26, e). The profile suggests a lithic flake, but potential micro-striations will have eroded. The hypothetical alternative of a metal tool, possible given the chronological context, cannot be ruled out. Some white surface is exposed, which may indicate further post-depositional breakage. However, the incisions still carry sediment and also expose white bone, and from other angles the bone appears worn. If not a result of micro-diagenetic differences, differences in cut-mark colours still only imply a correlation with different biographical states of bone modification (Krasinski 2018), rather than the absence of weathering.

While some residues are undoubtedly recent, there are two series of residues which are potentially of pre-taphonomic origin. The first pertains to red-orange patches with a smooth, non-grainy texture and mild translucence (Figure A26, g, j). These are best preserved in the central area opposing the perforations, but insignificant remnants are also encountered in other areas, primarily within fossae in the bone. The appearance would suggest an organic nature and it may pertain to remains of a colourant or protective wax. The second residue pertains to a light grey residue present in the internal surface of the mouthpiece, as a thin layer on the side opposing the V-shaped notch and as isolated sub-mm sized clumps on the walls between (Figure A26, k). It was originally considered as modern given that it has a relatively fresh appearance, and in LP-02, appears also on the outer surface. The residue superimposes a reddish brown material with a thicker texture (of unknown nature, but possibly soil). However, a common practice in ethnographic bone pipes is the partial closure of the apertures through beeswax, often mixed with resin. This narrows the paths through which the air stream can escape the resonance chamber, and is done to improve the musical capacities of the instrument (Izikowitz 1935). As such, the modern association is in question and the residue itself needs to be tested.

Object LP-02

The cultural association and collection history of LP-02 are equivalent to those of LP-01. It accumulated the same modern residues in its contemporary life phase, although in lesser quantity.

Procurement and manufacture

The flute is made out of a long bone from a medium-large mammal, deer is again the most probable identification (M.L.P. Hoogland, pers. comm. 2017). It currently measures 95mm lengthwise with a maximum width of 18mm. Onset cut-marks located on the lateral aspect at the rim of the opening (Figure A28, a, cf. e) indicate that the epiphysis was removed using sawing (as described for LP-01). Further, scraping marks are observed in several areas, particularly towards the midshaft and surrounding the perforation (Figure A28, b). This indicates either sculpting of the bony mass in these areas or defleshing of the bone. Given the presence of a perpendicular cut-mark in the midshaft area, defleshing appears slightly more probable. Although V-shaped in outline this cut-mark is shallow and irregular, and does not match well the angularity that would be expected of a sharp lithic as seen in the experimental morphologies. However, comparison with the published literature on metal cut-marks and the organic experiments still render a solid brittle as the more likely tool, possibly a coarse-grained material or a poor quality edge.

The perforation that remains in this side of the flute is identical to those observed in LP-01. Curiously it is located on the narrow lateral aspect of the bone, rather than the wider anterior aspect, but without the remainder of the object it is impossible to elaborate on the positioning or the use of tuning/direction holes in this technological system. If it pertains a tone hole, it is misaligned with the notch. The concave end of the fracture does not correspond to an intersected perforation. The notch was likely created using a technique that left it with the current fractured edges, as these bear developed wear (below). With pressure having travelled from the outside towards the inside, one potential candidate is chipping and breaking away the bone from the outside by using a solid implement to exert localised pressure. Still, this reconstruction stands at low confidence.

Parallel shallow fine lines occur in various locations. Three are near the metaphysis, two on the midshaft, and two between the perforations. All are perfectly circumferential with the exception of one closest to the opening, where the anthropogenic nature is revealed by a flawed connection of start and end strokes (Figure A28, c-d). Being functionally unrelated to acoustic design, they must be considered as decorative, embellishing the presentation of the flute. Unfortunately, their cross-sections are filled with sediment preventing a view at the incision technique.

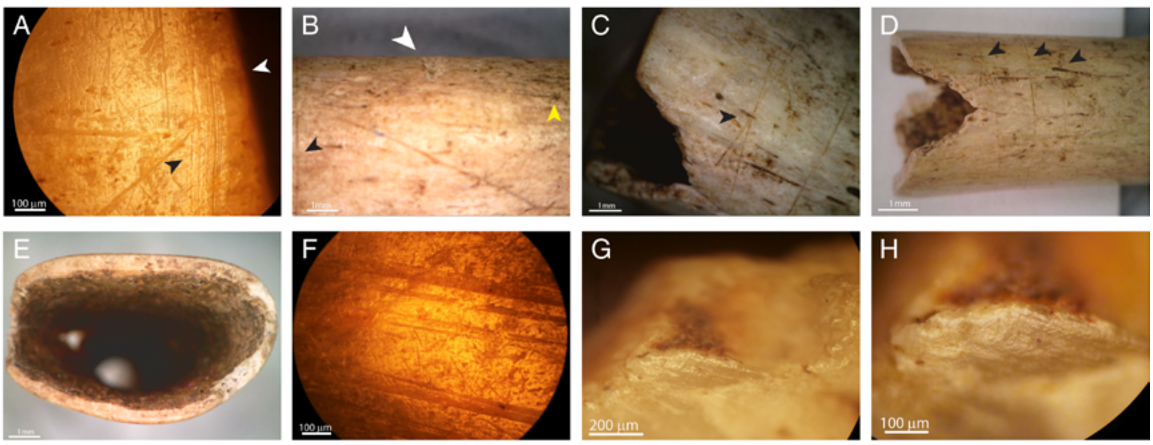

Figure A28: Manufacturing and wear marks on LP-02. A) parallel onset marks from incising motions (black arrow) at the opening of the mouthpiece (white arrow). B) midshaft stereograph with a fine line (black arrow), perpendicular cut-mark (white arrow),and parallel scraping marks (yellow arrow). C & D) poorly connected fine lines (arrows) and view of the large and small notch. E) top view. F) general microtopography of the surface. G & H) micropolish indicating contact with pliable to softer contact materials.

Use and deposition

While this object is far better preserved than LP-01, there is a similar lack of traces from handling and skin contact on the surface. Instead, the general surface shows a flat, abraded view that more than anything reminisces the continuous soft paper (un)wrapping the object has been subjected to in recent years (Figure A28, f). That said, the mouthpiece shows the same wear pattern evidencing sound production as was analysed for LP-01: an artificial notch with post-manufacture modification opposed by a breakage facet produced by inwards-oriented pressure. Here the irregularity of the notch walls has permitted more clearly the development of an extensive rounding, which corresponds to polish development indicative of a softer contact material (Figure A28, g-h). The exact nature is unclear without specified experiments (in)validating sustained wear production during the playing of the flute, as it is also possible that sharp fractures were rounded off after manufacture. However, both notch and (use-produced) facet propagate cracks running along the parallel axis of the flute, which in the case of the notch formed an open fissure in the wall. This fissure must be considered as potentially having inhibited the production of sound of the desired tonal range, since the place of the midsection break within the biographical trajectory cannot be ascertained. Last, the anterior aspect bears a large impact mark of uncertain origin.

Object p005

This bone pipe was recovered from amongst a small collection of forgeries (Section 6.2.6), but deemed to be of potentially early colonial origins. Inquiries with local inhabitants indicated that the provenience is the Telescope Point area, where it may be specifically related to a burial area or sand-blown dunes. However, questions remain as to the nature and location of this site and the potential relation of material culture with this provenience to La Poterie.

Procurement and manufacture

The instrument is made of a long bone of a large mammal, measuring 182 mm in length and 21 mm wide and 27 mm in thickness at the sculpted nose. The bone is probably made from the hind limb of brocket deer (*Mazama* sp.), possibly a tibia (Z. Ali and G. Shev, pers. comm. 2019). The excessive morphology of the excisions indicates the extensive growth thickness of the bony mass, which implies that the bone may have been pathological originally. Most regular bony features were modified or removed. Traces of the techniques used for potential epiphysis removal, defleshing, external abrasion of rugosities, and internal smoothening are no longer recognisable due to the advanced state of erosion. Still these were logically carried out, and the flattened aspect where the tone holes are located (slightly better preserved) forms direct evidence for an abrasive stage.

The mouthpiece bears a V-shaped inset, identifying the instrument as a notched end-blown flute. The notch appears to have been smooth walled before eroding, with the exception of minor breakage in the centre (Figure A29, a). This pattern is comparable to that described for LP-01, except that the angel of the notch morphology is more narrow. By comparison, the incursion in the sculpted end has jagged irregular walls and is the result of the bone fracturing inwards. Further, there are remains of a circumferential groove here with a wide symmetrical V-shaped profile and a thin bottom. It was likely set using a lithic edge, although it has been preserved poorly.

The instrument possesses five finished tone hole perforations and bears possible onsets for two more (Figure A29, b-d). The perforation proximal to the mouthpiece is smaller and located right

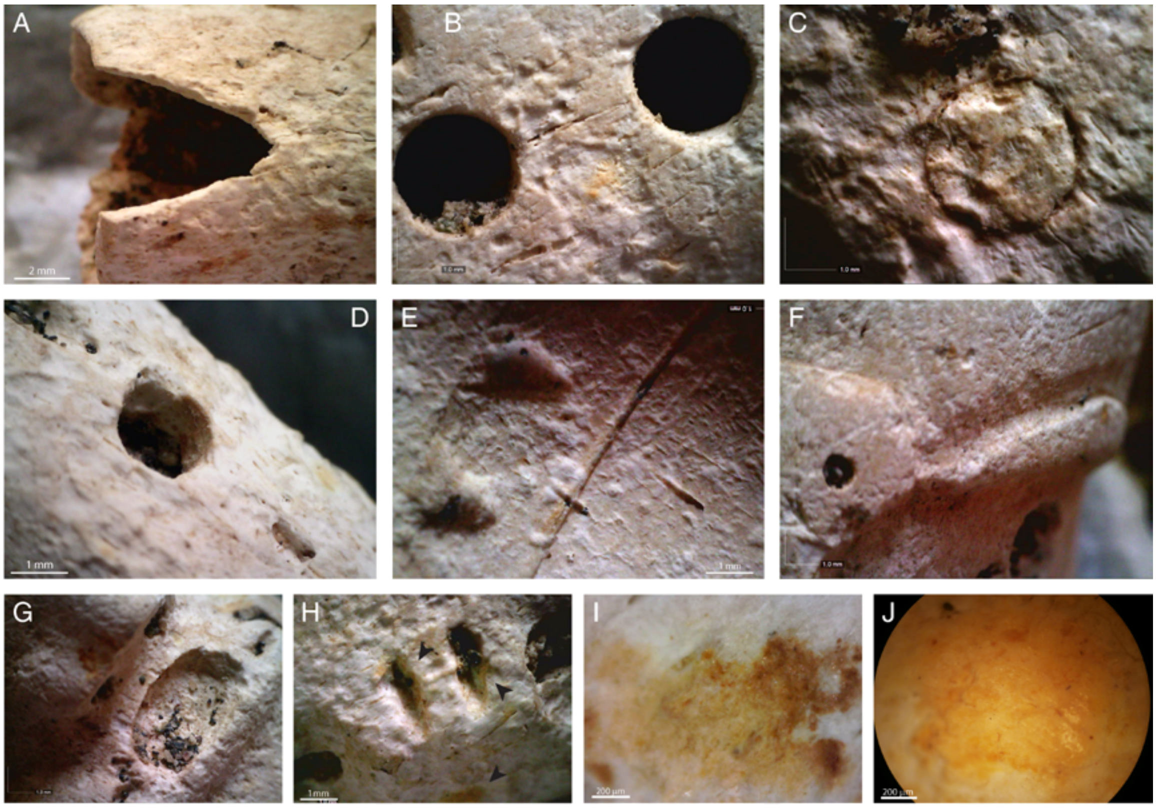

Figure A29: Manufacturing and wear marks on p005. A) mouthpiece notch. B) distal tone holes, closely spaced. C) proximal onset of a tone hole. D) proximal tone hole, with nutrient foramen. E) the headband. F) elements surrounding the eye brow, top left perforation being an ear. G) carved elements around the mouth. H) incisions delineating toe grooves, filled with and surrounded by residue deposits (arrows). I & J) Different views of the residue.

above the nutrient foramen, the other four are consistent in form and positioning. Their spacing from proximal to distal measures 5mm, 20 mm, 23 mm, and 3 mm. The large perforations are identical to those described for the La Poterie flutes, being straight walled near-perfect circles with a slight inflection at the point of entry. The smaller perforation differs in dimension and retains a view of the wall showing some measure of fine circular striations, if also mostly eroded. The onsets are both located in the axis between the intermediate and outer tone holes, and may remain from the prior planning of the intended tonal qualities/frequencies. They appear as fine lined, slightly wavering circles of equivalent shape and dimensions to the perforated tone holes, with tool contact probably only for a very short duration. These aspects favour a thin-walled tubular drill over a tooth bit, with a hollow reed being most likely.[58] The consistent diameter could indicate mature dimensions of the taxon (as they are consistent with the other windpipe tone holes also), and a smaller stem would then have been selected to produce the small perforation.

The squatted figure is excised from the surrounding bone, and the shape of the higher marked by repeated incision. The evidence thereof is found where the eyebrows, arms, legs, body areas, and headband border the lower laying bone, consisting of short, angular V-shaped grooves suggestive of sharp lithics. The extremities are curved in 120° and 90° angles, clutching the diaphysis as it were. They display short deep grooves, the result of sawing with a lithic edge (Figure A29, e). The lower areas in between, notably the cheeks, forehead, and flattened aspect of the tone holes, no longer

58 Reeds as the active drill bits are occasionally considered in the archaeological literature (e.g. Vargiolu *et al.* 2007; Unger-Hamilton *et al.* 1987; Warren 1969; Diehl and Stroh 1978), and are known from ethnographic scenarios. Morero *et al.* (2008) successfully experimented using a bamboo to drill marble, creating a straight tubular perforation with fine lined striations (echoing the observations by Hansford in Sax *et al.* 2004).

show evidence of their production. Hypothetically speaking, a sensible procedure would delineate the features through incision, after which chiselling and scraping was used to reduce the areas in between followed by localised abrasion to even out all frontal surfaces, still slightly smoother than the non-modified eroded parts of the shaft. However, the state of erosion does not permit corroboration of the actual operational sequence in these parts.

The figure contains four partial perforations, two shaping the nose holes and two for the ears, and three chiselled depressions forming the eyes and the mouth. The perforations are consistent in shape despite being of different dimensions, and in contrast to the tone holes, appear set using a lithic drill bit. More internal and less exposed, the eye and mouth depressions retain a surface roughness that is not entirely the same as the eroded bone surrounding it, particularly on the walls of these features. The oval depression could only be created by indirect percussion with a sharp point, similar to surfaces described above, not through a technique relying upon rotary motions.

The headband forms the upper border of the decorative sculpture, and consists of two elements. The first is a single incision that runs from ear to ear while making a wide curve above the eyebrows. This groove has close to vertical walls with a flat bottom, despite being overall narrow, and is slightly wavering over its length (Figure A29, e-g). Based upon the experiments and the literature, this could be formed either with a dulled metal blade, sawn with a shell lamina, or sliced with a lithic blade, but in a manner different from the other grooves. The entry and exit cuts favour a single gesture with a solid implement, but the field microscopic analysis did not permit a finer view. The border has an embossed appearance, characterised by broad notches with a U-shaped bottom, V-flaring walls, and start shallow reaching depth towards the opening of the feature. The eroded surface bears little clue towards the technique applied in obtaining these features. It is probable they are also chiselled, as there are slight morphological differences between the individual notches. Lbova and Volkov (2016) offer the same interpretation for morphologically identical features found in Upper Paleolithic Siberian mobile art, produced using flint burins and experimentally verified.

Use and deposition

One residue pattern is observed which may originate with the pre-taphonomical biography. This pertains to small stains of a light yellow to orange substance, which in a few instances is concentrated in a thicker, darker mass. It is located in numerous places, and most notable in the face and extremities of the excised figure and on the shaft proximal to the mouthpiece (Figure A29, h-j). The residue is a very fine-grained smear, comparable in texture but lighter in colour to the residue found on LP-01. A similar purpose may be postulated, i.e. remnants of a coating that once enhanced the visual appearance, though this inference remains weak without knowledge of the recipe and confirmation of its application on other items of early colonial material culture.

The eye and mouth depressions are well suited to carry inlays, in particular the mouth given that it is transfixed between the hands. However, no such indications were found during analysis. The only observation that pertains to possible modification is a light gold-brown hue that centres around the flattened tone hole axis and is spotty around the facial area. In both the surface is also slightly smoother than elsewhere, which corresponds to less extreme weathering. However, since the overall state of erosion on the piece remains severe it would be contentious to affirm prehensile wear based on only this pattern.

The same pattern of use that characterises the mouthpieces of the previously discussed flutes is also found in p005. The orientation of the tone holes is slightly offset against the longitudinal axis of the bone, particularly when considering the angle of the notch and the frontal aspect of the iconographic motif. As d'Errico *et al.* (2003) point out in their discussion of Paleolithic wind instruments, this obliquity may be functionally intended and has as effect that the pipe is positioned away from the player's face. If the instrument assumes this position the tone holes are rotated diagonally up and forward, which naturally directs the iconographic aspect to face outwards. d'Errico et al. (2003) further suggest that such pipes are not traditional flutes but function through pressured embouchure, aided with reed voicing insert. As noted in section 2.4, however, an analysis of tone and airflow is beyond the scope of this study.

Given the provenience of the object, nothing can be inferred with any reasonable certainty regarding the deposition phase. The foot end fracture may have induced deposition of the instrument, the crack running between the third and fourth perforation may have harmed its acoustic quality, or both may be post-depositional and a third, unknown reason spurred its entry into the archaeological record. There seems no clear basis for favouring any of these hypotheses over the other ones.

Object p007

The cultural association and collection history of p007 are equivalent to those of p005 and p006.

Procurement and manufacture

The long bone originates with a medium-large mammal, possibly a deer of the species mentioned before (M.L.P. Hoogland, pers. comm. 2017). It measures 148 mm with a thickness of 23 mm, but is fractured on both ends. As such the location and technique of epiphysis removal cannot be ascertained, and tone holes aside all other surface marks pertain to the iconographic modelling.

The carving techniques include excision through incision, scraping, whittling and chiselling. Single incisions consist of thin V-shaped cuts, often with multiple gestures clustered together to excise wider areas (Figure A30, c, g). The most likely tool was a sharp lithic edge, though given the field analysis setting and historical context a sharpened metal edge cannot be ruled out with absolute confidence. The scraping and whittling traces are much more shallow, and both appear as bundles of striations; long and parallel for scraped areas, and overlapping wavy striations for whittled parts (Figure A30, a-b, d). The most probable tool is a serrated rim with small, consistently spaced asperities, variably applied, but the type and material (lithic, shell, another local alternative) cannot be determined without additional experiments. Finally, chiselling is implicated in the removal of material from the neckline below the jaw, given the rougher surface, furrows from slippage of the tool, and absence of sets of scraping striations. An unknown quantity of material has been removed to reduce the original morphology into the present figurative aspects, for which chiselling was probably the most effective means.

The design is that of a squatted figure, but unlike p005, the extremities are bent to 180° angles. Regardless, the sequence of operations is the same: the design is made by incising the outline, other areas are lowered and smoothened by scraping and/or pecking, and digits are again sawn. While the figure has sharp corners and a blocky appearance, the corners are not easily reached using any of these techniques and indeed present the best preserved traces (Figure A30, a, d-f). The face consists of an excised nose in between an ʊ-shaped (upsilon) slit that expresses both the mouth and the eyes, and a headband. The ʊ-shaped slit is the result of short cutting gestures that together create a wide,

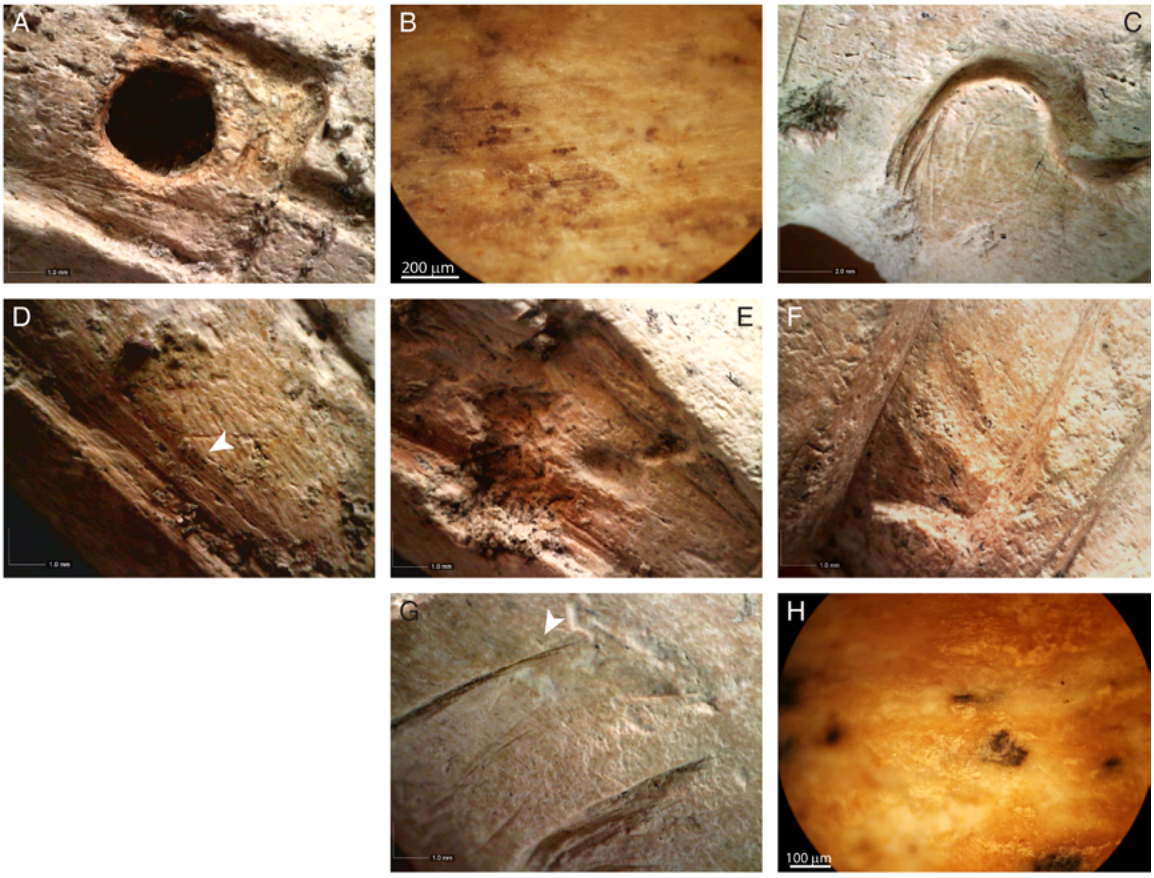

Figure A30: Manufacturing and wear marks on p007. A) distal perforation, excision, and whittled/scraped surface. B) high magnification view of whittling traces. C) left side detail of the facial slit. D) excision and scraping/whittling (white arrow) on the side. E) excision and scraping on the side. F) chiselling furrows in the excised space between chin and shoulder. G) right side detail of the facial slit and headband onset (white arrow). H) high magnification view of higher topography.

meandering groove even if the corners remain slightly angular. The headband consists of a thin groove that evidences the same cutting traces with some misalignment. It is analogous to the line on p005, but sloppier in execution. The circumference of the face is probably chiselled, but finished with a deep incision, perhaps sawn, giving the appearance of a mask applied to the bone shaft (Figure 61).

Three tone holes are set within the diaphysis (Figure A30, a), spaced 22 mm apart and oriented along the long axis of the bone. They are all near circular with straight walls and still possess minor entry inflections, thus indicating they were placed after excision of the area. The morphology is consistent with the perforations seen on the other three flutes, and must be attributed to the same technology. The upper hole is broken with the fracture extending along the same axis, but the fracture walls do not show evidence of another perforation situated in that area. The space between the lower hole and the break is ca. 38 mm, rendering it unlikely that the missing bone hosted additional perforations: not only is this distance far greater than any other tone hole distance seen thus far, it would also be located closer to the approximate mouthpiece than in each previous instrument.

Use and deposition

With both the mouthpiece and the foot having broken, the instrument lacks indications for use beyond displaying the capacity to function through tonal manipulation of an airflow. Briefly observed for p005, a gold-brown hue is reasonably clear on the facial aspect. It is more closely spaced, and the affected surface is smooth and less affected by deterioration. Microscopic traces remain sparse and not entirely distinctive, but the occasional observation is made of fine striations in thick polishes (Figure A30, h). Patterns of golden-brown patination from presumed use (Section 5.3.4) that are macroscopically evident on bone flutes in related assemblages show similarities in distribution (e.g. Antczak and Antczak 2006, Figure 408). These centre on the entire tone hole area, distinct from the distant opening and not clustered around the tone holes where most finger action takes place. The traces on p007 are still not entirely convincing, despite the better preservation of this instrument. Nevertheless, it is not a stretch by any means to assume regular manipulation of the flute.

The nature and timeframe of the breakages and difficult to ascertain. The fracture near the head follows in part a groove leftover from the excision process, indicating it may have been the result of induced weaknesses in the shaft. The thick bony mass of the face prevented breakage across the motif when the responsible force exerted its weight on the piece. The relation between the distal fracture and the biography is unclear. The perforation break will have rendered the flute useless, but as this part of the flute is heavily deteriorated, it is quite possible that the break is taphonomical.

With regards to the depositional history, two surface aspects stand out. The first aspect is the heavy erosion that appears to be concentrated in a few locations, opposing the otherwise less degraded normal surface and the smoother, slightly patinated areas. The erosion is effected as a loss of bony matter that includes pitting and tunnelling, damaging the structural strength of the shaft. The type of surface modification on p005, which appears to dissolve layer by layer, is not seen here. The second aspect is the presence and distribution of impact craters and damage spread across the surface. The timing and nature of these is uncertain; it is not implausible that a number relate to the modern removal of the strongly adhesive sediment encrustations – and with it, the outermost layer of bone. Otherwise, the impact marks (Figure A30, e) are not dissimilar from published descriptions of carnivore gnawing (Blumenschine *et al.* 2007). However, other marks – including the larger ones on the facial aspect – are almost certainly the result of impact damage, and the ones with sedimentary filling can be taken to have occurred at the time of deposition at the latest.

Object p006

The cultural association and collection history of p006 are equivalent to those of p005 and p007.

Since the iconographic motif is poorly contrasted with the unmodified bone surface and difficult to visualise due to the sharp tibial line, a brief description of the anthropomorphic stylisation is provided. The face consists of delineated eyes, nostrils and a mouth circumscribed by a line following a heart-shape that might index the cheeks, and is topped by a double groove headband running lateroproximally. The distal patterns commence from double grooves descending from lateroproximal orientation, to end at a horizontal double groove. Below it lateroproximal grooves run to the anterior aspect, from where they continue in laterodistal orientation. These latter grooves, alternatively described as sideway chevrons, are most likely the squatted legs of the figure in keeping with Antillean stylistic convention. This would render the horizontal grooves the belt and the lateroproximal grooves above the arms. The motif in between the face and the distal body consists of six symmetric perforations, enclosed by a curved double groove.

Procurement and manufacture

The bone has been identified as the left tibia of an adult human, and measures 318 mm with a thickness of 42 mm. Given the damage to both sides and lack of reference for indigenous Amerindian populations, stature cannot be approximated. The origin of these breakages is unknown, as there is no technical scheme apparent that relates to opening up the medullary cavity. It is theoretically conceivable that the epiphyses were crudely broken through hard hammer percussion, resulting in the observed propagation, but this is not considered likely. Other bony features such as crests and lines on the medial shaft remain. The sole wider surface modification consists of a field of connected/covered long, coarse striations mediodistally from the (missing) tibial tuberosity (Figure A31, a). This is most succinctly explained by filing using a narrow tool with a homogeneous small-grained texture but no true edge, such as the sandstone sheets found in La Poterie (Section 6.2.5), a potsherd, or against the edge of an abrasive platform: the surface is inconsistent with single asperity motions and the spacing and homogeneity of the striations argue against a scraping edge where (use) retouch would create different sizes and distances between the asperities, not to mention leave sharper striations as with p007.

The engravings of the motif can be subdivided into two types: broad grooves and incomplete perforations.[59] Most grooves are wide and shallow, have almost imperceptible boundaries with the surrounding surface, and possess bands of coarse, elongated striations (Figure A31, b-d). Although banded more closely than the surface striations mentioned before, their size and morphology appear virtually identical. The straight horizontal grooves located medially are more narrow but their internal surface also follows this pattern. In all likelihood these engravings were filed using the same type of tool, operated at an angle. The sunken profile seems to have protected the striations better against surface erosion, which become more faded towards the wider surface.

Twelve incomplete perforations are placed on the bone, two serving as pupils, two as nostrils, two for the ears, and the remainder six arranged below the face in a symmetrical two by two fashion left and right of the anterior crest on the medial and interosseous surfaces. All but the distal two on

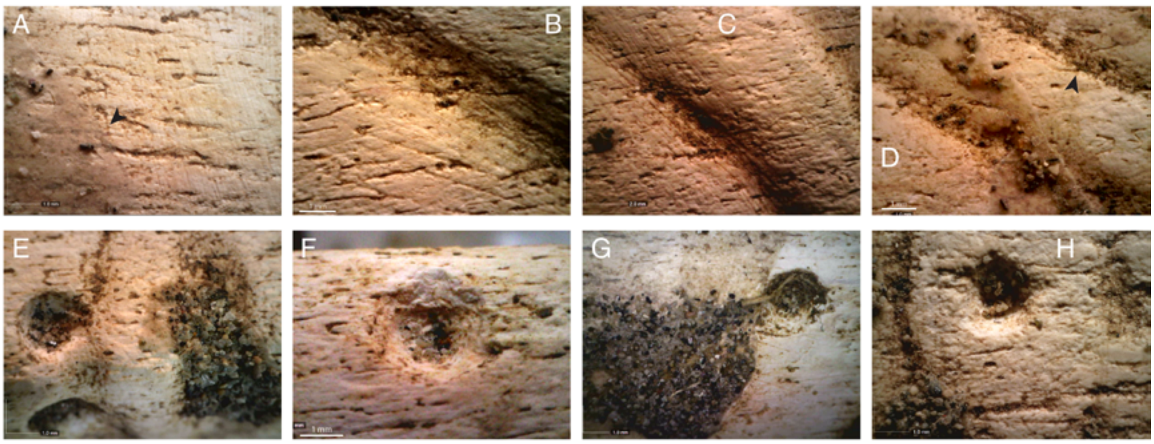

Figure A31: Manufacturing and wear marks on p006. A) clustered striations attributed to filing, and pinkish residue (arrow). B & C) striations in a wide groove. D) striations (arrow) alongside pinkish residue in a narrow groove. E) nasal perforations and mouth, filled with sediment. F & G) 'button' perforations. H) eye perforation and parts of the surrounding outline.

59 Experiments with incising human bone (Ragsdale *et al.* 2016) have provided wear traces identical to those resulting from incising other materials within the same technological complex (Velázquez Castro 2012; Velázquez Castro and Melgar Tísoc 2014). Accordingly, I take wear trace formation on human bone to be not significantly different from the experimental bones for my purposes, not more so than the usual differences of taxon, cancellous/lamellar, and bone density.

the interosseous surface are unobservable due to encrusted sediment; the remainder two show a wide cone with sediment obstructing the view on the leading edge (Figure A31, e-h). One shows concentric striations, the others even pitting, and while some outlines are circular a few others appear subcircular. This suggests that a fairly blunt, solid point was used to produce the perforations, functioning as a hand borer used in twisting and chiselling gestures. A similar tool may have been used in drawing the outline of the eye sockets (Figure A31, h), which otherwise do not share the traces of the grooves.

Use and deposition

No traces of use were evident on the surface, nor in the interior insofar observable. There are no clear traces that relate to the deposition of the bone either. The timeframe of the fractures on either end is not definable and since there are two it is probably not accidental, nor obviously technological as stated before.

Various areas of the flute carried a viscose, pinkish residue (Figure A31, a, d, g). These residues were located on or near grooves, and form thin plaques overlaying the surface, in turn usually overlain by large amounts of adhering sediment. During analysis one such patch broke off the surface, and tore off the outer layer of bone lamellae. The nature of these residues is unclear. It is possible that they are remnants of a coating similar to has been hypothesised for previous flutes, although composed of an entirely different type. Alternatively, they could be more modern in nature. Its transparency allows limited viewing of the bone underneath which appears to have suffered from erosion as much as any other surface area. Conversely, the coherent and sharply bounded structure of the individual patches does not appear to have deteriorated much at all. Testing is needed to verify the nature of this residue, and if of modern origin, the fact that it is overlain by sediment puts to question the entire biographical trajectory of the bone.

Observations on authenicity

The four windpipes are on the whole technologically cohesive, which lends strong support to the thesis that p005 and p007 are authentic, originating from the same cultural context as LP-01 and LP-02. The advanced state of wear of the three specimens from Telescope Point might be emulated by a skilled forger. However, the details of the alterations are quite different for each of the pieces, indicating different micro-environments for each. They also clearly overlay production stigma in all three, even if some sharper corners remain in the best preserved specimen (p007). The production traces are in any case not the result of mechanised work but that of more detailed hand-work, equivalent to the techniques seen in the specimens from La Poterie. In the field, these traces also stood out as clearly different from the fresh, sharp, and deeply sawn engravings on the forgings made on surface-weathered bones from introduced mammals (*Bos* sp. and Caprinae) in the private collection.

The probability that a skilled forger is responsible for the manufacture of these objects is deemed to be very low. That would require the emulation of the use life and of taphonomic degradation in different micro-environments, as well as knowledge of historical indigenous boneworking techniques, iconography, and aerophone design. There are no preceding examples of archaeological aerophones (with obvious economic value to looters) known from the Windward islands that could serve as inspiration, at it is improbable to assume that all of the design specifics converge with the flutes from La Poterie by chance. Furthermore, there are no other examples of objects identified as forgeries from such expertly capable contemporaries. Research is ongoing into the networks of forgers and artisans of contemporary imitations on the island (J. Hanna, pers. comm. 2015), but thus far there are no plausible cases known of persons on the island working with the kind of materials and skills seen in the windpipes as of yet. Knowledge of indigenous manufacturing technique is more likely to have survived or be closely emulated on the mainland (Venezuela or the Guianas, where also deer bones are more realistically available), but that raises additional questions on provenance routes.

The strength of the biographical evidence for an authentically early colonial trajectory is less compelling for p006, however. It is technologically distinct from the aerophones, evidencing only files for abrading and a hand-held point to drill depressions. There are still no comparable modern materials that I am aware of, but also no comparable archaeological/early historical artefacts that I have analysed. The concept of carved bone pipes is present in the archaeology of the region (if as rare artefacts), but so it is in modern forgery. As such I presently consider proclamation for either biographical trajectory premature. Chronological verification of at least the three bones themselves via means of radiometric dating of the carbon in the collagen is unfortunately not possible, but perhaps there remain avenues to be explored using the sediment adhering to the medullary cavities or the residue deposits still present.

A4.4 Wooden objects

Object p004

This object was recovered washed up from the seawater inlet on the public beachfront of Fort Jeudy in Grenada. The cultural context is unclear, given that materials from both earlier and later ceramic traditions continuously wash up elsewhere along the coastline. In all likelihood there are one or more archaeological sites located in the shallow inlet, which submerged some time after the deposition of the wooden artefact. Stylistically the object may be considered as bearing Chicoid influences in its carvings (Petitjean Roget 2015a, 150), but given how little is known about ECA woodcraft (the dominant cultural phase on Grenada) and the evidence for centuries-long biographies on other wooden artefacts (Ostapkowicz *et al.* 2011; 2012), I hesitate to follow his attribution to the 15th century.

This analysis is preceded by a note on the level of inference, which must be considered as low. Use wear traces are not commonly studied on wooden artefacts, and where done so tend to be restrained to impact traces of use and major technological categories. Examples include the technological analysis of the wooden spears from Schöningen (Schoch *et al.* 2015), research into aboriginal projectile spears from Australia (Nugent 2015), the study of use wear traces on two wooden artefacts from Patagonia (Caruso Fermé *et al.* 2014; 2015), and the analysis of archaeological and historical wooden objects in France (e.g. Mille *et al.* 2014), notably including a radiotomographic study of a Tupinamba mace from the Musee du Quai Branly (Lavier *et al.* 2009). Only Nugent (2015) conducted experiments aimed at supporting functional interpretations, focused on tip damage and gouges (angular marks). She still found these unreliable in the interpretation without supporting residues. Concurrently, I consider the field as lacking established rules for the interpretation of contact materials from the wear traces observed on wooden artefacts (with or without experiments).

Procurement and manufacture

Since the analysis was conducted in private setting, there was no possibility for sampling or consulting with a specialist in wood anatomy. A relatively straight grain is visible diagonal to the face, but potential growth rings are not. Petitjean Roget (2015a, 150) does suggest the wood to be mahogany based on its light weight and piquant odour, but this was not independently verified. The homogeneous dark brownish colour is nominally suggestive of heartwood extracted from a thick branch or small trunk, but taphonomical alteration is certain given its provenience. The outer rim of the object probably matched the dimensions of the extract, which currently measure 34 by 31 mm with a maximum thickness of 11 mm. Potential traces of sapwood or bark removal are no longer present due to the progressive removal of woody matter from the side. This was accomplished through scraping with a suitable implement, probably lithic, leaving an even surface bordered by a protruding rim on the frontal and distal borders (Figure A32).

The engraving and hollowing out procedures are not fully reconstructable, but some basic suggestions can be offered. The frontal incisions, half-perforations, and socket outlines were likely placed before the backside was hollowed out, in order to benefit from the woody mass sustaining the effort. This would have been removed subsequently to expose the inner surface, although there are no indications as to what method was used. The depressions preforming the eye and mouth sockets were reached first to allow a precise view of the remaining thickness and avoid breaching other incisions and perforations. These were later enlarged from the backside, resulting in the present bevels. Most shaping activities seem to indicate carving or chiselling with a sharp implement, since none of the surfaces are fully levelled. The inside may also have been lightly abraded, considering the surface and walls have generally smooth appearances in spite of persistent micro-relief, but this is difficult to tell given the encrustation of sediment.

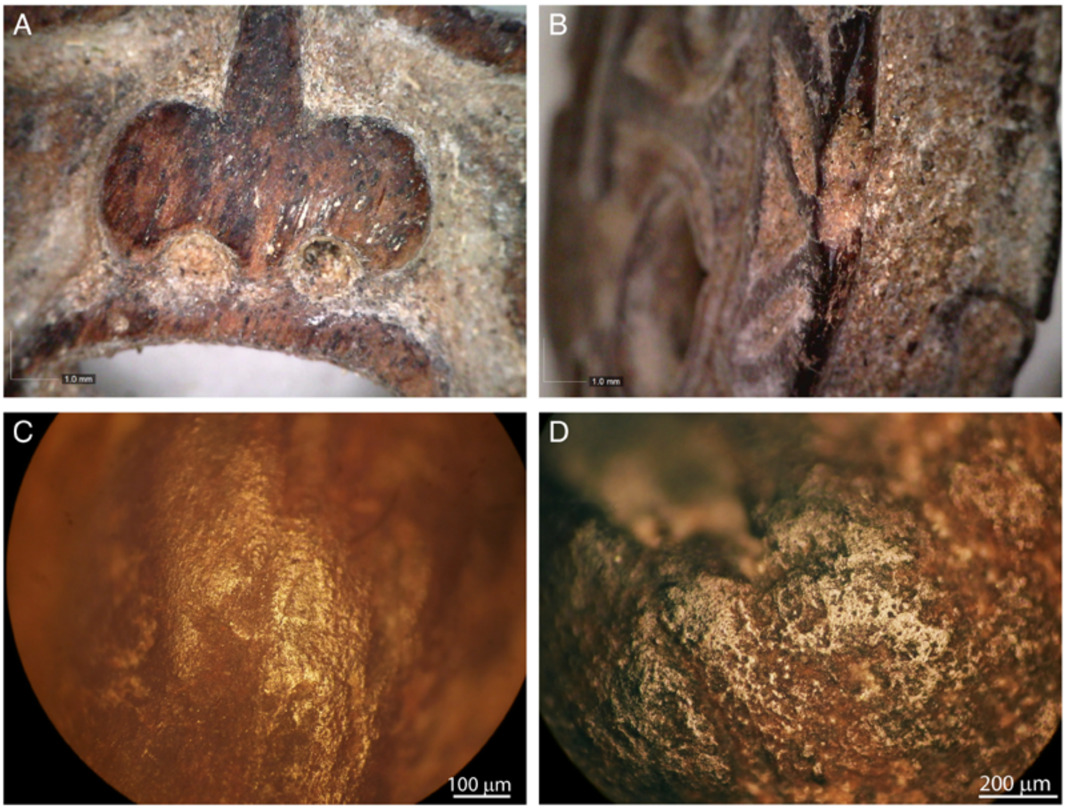

Figure A32: A) detail of the facial engravings, light patination, and extent of encrustations. B) protruding rim of the side, bearing a dark oily patina from wear during use. C) microwear polish in association with the patina on the face. Note the relation to the original topographic elevation. D) different microwear polish in association with the patina on the sides.

A rotary drilling technique is affirmed only for the incomplete perforations of the auditory canals and nasal cavities. The perforations appear to reach ca. 1 mm in the blocked nostrils and ca. 2 mm in the ear canals, and are perfectly cylindrical for as far as they are observable excepting the slight conical onset that distinguishes it from normal cylindrical perforations (Figure A32, a). The most likely bit would be long and thin such as a small fish bone, although any sufficiently shaped bone splinter or wood fibre would work equally. This would be supported by abrasives which would enhance the penetration of the drill into the wood, and further form a puddle near the entry. This was observed during each of the abrasive-supported drilling experiments conducted (Falci 2015c; Breukel and Falci 2015; Falci *et al.* 2017b), and may potentially create the observed conical inflection in the comparatively softer wood. A V-shaped bit from a brittle lithic point, such as flint, is categorically ruled out. To my knowledge this type of perforation profile has not been described for other insular Caribbean objects (Carlson 1993; de Mille and Varney 2001; de Mille *et al.* 2008; Falci 2015c; Lammers-Keijsers 2007; 2008).

Use and deposition

There is one main observation that most likely pertains to contact through use activities. Most of the outer surface areas on the frontal aspect are marked by a darker, glossy patina. The distribution corresponds very well to the outer excised surfaces which would sustain both first and the most extended interaction with a contact material, and opposes taphonomical or chemical alterations given that the lower areas are unaffected (Figure 63; Figure A32, a, c). The wood fibres appear rounded, and there is an adequate correspondence with the distribution of polish in these areas. The polish structures bear noticeable similarities to traces previously reported as use-related (Caruso Fermé *et al.* 2014, Fig 5; 2015, Fig 7). They generally appear in close connection, with a uniformly duller rough-ish texture and deep invasiveness, overlaying but not erasing internal elevation differences. Small striations or a mild directionality were seen a few times, but not in a consistent orientation. The description is suggestive of softer material contact, although given the paucity of knowledge on trace formation on wood a distinction is not made between any candidates. Still, it can be stated that the frontal area was exposed to frequent contact of a softer nature.

The sides of the artefact and posterior rim also display a dark glossy patina, which under microscopic examination this corresponds to a contrasting wear trace pattern (Figure A32, b, d). It is not as invasive, somewhat pitted and reticulated over the higher peaks, and appears to have erased previous elevations. Altogether, it points towards contact with a harder type of material. This pattern is well developed across the posteriorly located side rim and the outer circle of the back. It suggests that the artefact experienced harder material friction on its sides and back. The macroscopic patination may have formed from adhesive wear or tribochemical interaction caused by the oils or similar substances from the wood itself, and are not necessarily incongruent with contact with an unyielding material. The participation of internal lubricants and chemicals in wood use wear has not been explicitly studied before, to my knowledge. Of note is that the lower lying area in between appeared devoid of wear from use, in particularly notable contrast to the soft contact wear developed on the face. This argues against the interpretation of this object as an ear spool, previously made on the notion that the side rims seemed morphological adaptations to prevent slippage in such a mode of attachment (Petitjean Roget 2015a, 150).

It must be noted that the regularised inflection on the inner surface of the oral cavity and eye sockets is morphologically indicative of an intended joint with another object, such as an inlay, but no traces or residues were found on this area to support such an inference.