



BOOK OF ABSTRACTS

MULTI-DISCIPLINARY PERSPECTIVES ON
EARLY GLOBALISATION
CONFERENCE, 7-10 NOVEMBER, 2013
JESUS COLLEGE, UNIVERSITY OF OXFORD



Proto-Globalisation in the Indian Ocean World

Oxford, 7-10 November 2013

Conference logo ship image: Based on a rock art image from the site of Ili Kérékééré in East Timor recorded by Sue O'Connor, published in the paper "Rock art: A potential source of information on past maritime technology in the South-East Asia-Pacific region" (*International Journal of Nautical Archaeology*, 2007), and used with the permission of Peter Lape and Sue O'Connor.

Cover image: From the world map produced by Johannes Schnitzer in 1482.

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PREFACE

A warm welcome to Oxford and the Proto-Globalisation in the Indian Ocean World Conference. The overwhelming response to the conference announcement, reflected in the packed programme over the coming days, highlights current levels of excitement about the early Indian Ocean. Much of this excitement certainly stems from the opportunity this new geographical orientation provides for challenging the area studies paradigms that have dominated archaeological and historical research for decades. Studying the Indian Ocean world means moving beyond comfortable and familiar geographic locales to engage with new regions, research groups and scholarly views. The commercial and cultural networks of the ancient past are echoed in emerging scholarly networks that bridge Africa, Arabia, Europe and Asia.

But novel perspectives don't mean moving only beyond geographical foci but also disciplinary boundaries, and engaging archaeology not just with history, anthropology and linguistics, but also crossing the humanities and natural sciences divide to talk to scientists mining rich new genetic datasets. The spectacular explosion of molecular genetic data, fuelled by ever increasing technological and computational power, has provided opportunities for archaeologists and historians to engage with colleagues in molecular genetics to explore new perspectives on the past.

We hope that the coming days will offer a wealth of new opportunities for cross-geographical and cross-disciplinary engagement, discussion and debate. In many ways, the study of the early Indian Ocean is in its infancy, with old

ideas waiting to be transformed by current and future generations of scholars. This conference explores key themes that are the focus of contemporary research, but also aims to set an agenda for future research. We hope that you enjoy a stimulating four days in Oxford, and leave with new ideas and collaborations as well as a greater sense of the extraordinary connectedness of the ancient Indian Ocean world. Whether and how these early connections compare to the globalisations of today are questions that aim to fuel discussion and debate, but as we consider long-distance networks and exchanges centuries and even millennia ago, it is worth exploring their implications for the challenges and transformations of today.

We gratefully acknowledge the support of the European Research Council and the Wenner-Gren Foundation in funding this conference, as well as the assistance of many individuals and volunteers, from the Sealinks Project, the Oxford University School of Archaeology, the Ashmolean Museum, the Oxford Centre for Asian Archaeology, Art and Culture, and Jesus College. The funding of the Sealinks Project through the European Research Council and other granting bodies has enabled the project to serve during its duration as the catalyst for a wide range of new linkages between projects, institutions and disciplines, and these connections, tied to the outcomes and synergies of interdisciplinary meetings like this one, will undoubtedly constitute one of its key lasting impacts.

Nicole Boivin
Alison Crowther
Solomon Pomerantz

ROBERT E. DEWAR, 1949-2013

With the death of Robert Dewar, the Indian Ocean research community has lost a respected and generous colleague and friend. Bob worked for 34 years on the palaeoecology and human ecology of Madagascar, and generously collaborated with the Sealinks Project during his final years. Bob died at home in Middle Haddam, Connecticut, USA on 8 April 2013, just after approving the first report on the work of his team at the cave site of Lakaton'i Anja in the far north of Madagascar.

Bob was a graduate of Yale University, completing his doctoral dissertation on the archaeology of Taiwan in 1977. When he married Alison Richard, already well known for her studies of Madagascar's lemurs, it was understandable that Bob would pursue his interest in human impacts on tropical environments on this veritable 'mini-continent' in the Indian Ocean. During the late 1970s and 1980s, Bob re-visited sites where the remains of Madagascar's large flightless birds, giant lemurs, and pygmy hippopotamuses had been found, assessing claims for human-caused extinction of these fauna. His first papers on extinctions in Madagascar (1984, 1986) were the result, and his contributions to the issue of extinctions continue to set the agenda for research (Dewar 1997).

Bob's broad view of ecology, cultural adaptation, and Malagasy cultural change (Dewar and Wright 1993) led him to organize a variety of basic regional studies on Madagascar's coastal regions in the far north (Dewar

and Rakotovololona 1992) and east (Dewar et al. 2011) of the island. The last was a survey of the Bay of Iharana, an area whose estuaries and large lagoon he predicted would have been attractive to early coastal settlers. From a base in the sleepy port town of Vohémar, the team intensively studied the hinterland hectare by hectare, recording scatters of pottery and shells marking the villages and hamlets from more than a millennium of Malagasy occupation. Some of these indeed proved to be villages of the 8th century AD, among the earliest we have ever discovered, and Bob generously encouraged the Sealinks Project to return to further investigate these sites.

In addition, Bob and his team found Ambohiposa, a small rock shelter, which in 2008 and 2009 yielded tiny flint and obsidian tools, some of them possible projectile points. Unfortunately, the acidic deposits of this site had destroyed any bones of whatever animals had been hunted. For several years, we searched for another such site with better evidence, alas without success. In 2011, however, we revisited Lakaton'i Anja in the far north of Madagascar, discovered by Bob's team during the 1980s. Bob thought there might be very small tools there that had been missed in the 1980s. This proved to be the case: in layers where the bones of both extant and locally extinct hunted lemurs as well as marine shells had been identified, we also found tiny artifacts similar to those from Ambohiposa. Furthermore, OSL dating has indicated that the early layers at Anja are older than 2000 BC. These discoveries change our understanding of the early impact of people on Madagascar. It was not a natural

paradise untouched by people before the arrival of fishers, farmers, and herders with iron tools and ceramics about AD 500. Hunter-gatherers using stone tools lived in Madagascar's environments for millennia before iron-using communities were attested. Bob and the Anja team were able to submit the first report on the studies from 2007 to 2011 in his last days with us (Dewar et al. 2013).

Field studies, however, are only one aspect of Bob's work. During the 1990s, he made a fundamental theoretical contribution to the estimation of human population size in archaeology. In both nomadic hunting societies and settled villages and towns, during a cultural period of a few centuries, one community can leave many sites. Bob proposed a solution in which the rates of site foundation and site abandonment were derived from the survey evidence and used to model the number of simultaneously occupied settlements (Dewar 1992). Bob used his model to assess population change in both the Near East (Dewar 1994) and Madagascar (Dewar 2007). Bob's writings with Alison about ecological processes are equally impressive (eg. Richard and Dewar 2007).

Bob's impact as a field researcher and theoretician cannot be understood without recognizing his fundamental wisdom and humanity. He saw worth in every person, and helped them in any way he could. His humanity was manifested in great personal generosity in the form of gifts to students and institutions, but also of gifts of his wisdom, often couched in wry humor. Chantal Radimilahy, present Director of the Institute des Civilisations/Musée d'Art et

d'Archaeologie well remembers puzzling over the hurtful and incomprehensible behavior of other colleagues; Bob gently smiled and replied "Chantal, you know the expression 'Judge not lest you be judged' ". I myself remember whinging to Bob about feeling badly used and poorly supported. Bob simply said "Henry, you and I are very, very privileged." I shut up.

As Jean-Aimé Rakotoarisoa, long time colleague and past Director of the Musée d'Art et d'Archaeologie in Antananarivo has so eloquently said, "au revoir Bob, pas adieu, car nous prendrons tous un jour le chemin que tu viens de prendre."—"Until we meet again Bob, not 'goodbye', because we all will take the road which you have taken".

Henry T. Wright
Museum of Anthropology, Ann Arbor

References

- Dewar, R.E. 1984. Extinctions in Madagascar: The loss of the subfossil fauna. *Quaternary Extinctions*, P.S. Martin and R.G. Klein, eds. University of Arizona, pp. 574- 593.
- Dewar, R.E. 1986. Ecologie et extinctions des subfossiles de Madagascar. *Taloha* (Révue d'Archéologie du Musée d'Art et d'Archéologie) 10: 25-41.
- Dewar, R.E. 1991. Incorporating variation in occupation span into settlement-pattern analysis. *American Antiquity* 56(4): 604-20.
- Dewar, R.E. 1994b. Changing population patterns during the early phases of occupation on the Deh Luran plain. In *Early Settlement and Irrigation on the Deh Luran Plain*, J. A. Neely & H. T. Wright, eds., pp.

200-211. University of Michigan Museum of Anthropology, Technical Report No. 26. Ann Arbor

Dewar, R.E. 1997. Were people responsible for the extinctions of Madagascar's subfossils, and how will we ever know? In *Natural Change and Human Impact in Madagascar*, S.M. Goodman & B.D. Patterson, eds., pp. 364-377. Smithsonian Institution Press.

Dewar, R.E. 2007. Contributions to *Early State Formation in Central Madagascar: An Archeological Survey of Western Avaradrano*, H.T. Wright, ed. Museum of Anthropology, University of Michigan, Memoirs, No. 43

Dewar, R.E., Radimilahy, C., Rasolofomampianina, L.D. & Wright, H.T. 2011. Early settlement in the region of Fenoarivo Atsinanana. In *Civilisations des mondes insulaires (Madagascar, îles du Canal de Mozambique, Mascareignes, Polynésie, Guyanes)*, C. Radimilahy and N. Rajaonarimanana, eds, pp. 677-740. Paris: Karthala.

Dewar, R.E., Radimilahy, C., Wright, H.T., Jacobs, Z., Kelly, G.O. & Berna, F. 2013. Stone tools and foraging in northern Madagascar challenge Holocene extinction models. *Proceedings of the National Academy of Sciences* 110 (31): 12583-12588.

Dewar, R.E. & Rakotovololona, H.S. 1992. La chasse aux subfossiles: Les preuves du XI^{ème} et XII^{ème} siècle. *Taloha* 11:4-15

Dewar, R.E. & Wright, H.T. 1993. The culture-history of Madagascar. *Journal of World Prehistory* 7:417-466.

Richard, A.F. & Dewar, R.E. 2007. Evolution in the hypervariable environment of Madagascar. *Proceedings of the National Academy of Sciences* 104 (34): 13723-13727.

ABSTRACTS

In alphabetical order

ABRAHAM, Shinu

PORT SITES AND GLASS BEADS: AN INDIAN OCEAN CONTEXT FOR EARLY SOUTH INDIAN PRODUCTION AND EXCHANGE

Shinu Abraham

Glass beads are a ubiquitous element of the Indian Ocean archaeological record, but their geographic range and chronological depth pose a unique challenge, especially in the effort to model the societies that produced, distributed, and used them. Their value lays in the search for patterns, at varying scales of analyses, in order to understand, not only the beads themselves as sociocultural objects, but also the communities behind bead manufacture and flow and the settlements at which they are found. When considering the two best-known early port sites in South India, for instance, we find at one, Arikamedu, the most persuasive evidence for the manufacture of a major glass bead type – Indo-Pacific beads – but not in striking quantities. By contrast, the other port site, Pattanam, has yielded finished Indo-Pacific beads in the tens of thousands, but as yet no conclusive data for local production. Explaining these patterns requires situating both sites, and their associated

bead data, in the context of both their hinterlands and the other Indian Ocean port sites to which they were linked.

BALVALLY, Ritvik G.

TORPEDO JARS IN INDIAN OCEAN TRADE: A PETROLOGICAL EXAMINATION

Ritvik G. Balvally

Torpedo jars are West Asian transport vessels that constitute a major part of the Indian Ocean overseas trade assemblage. Their nomenclature is specially related to their shape. These jars have no neck or handle to hold, and slope down either by forming a slightly convex or straight side with occasional high ribbing, which finally narrows toward a semi-hollow base. They are often coated with bitumen along the interior surface. Their distribution in the Indian subcontinent is confined to the western coastline and peninsular region, and they are also found in Sri Lanka. The function of these vessels varied; they may have served as containers for trade commodities or for burials (Tofighian et al. 2011) depending on location. This paper presents the results of a typological and petrological examination of Torpedo jars from selected sites. Preliminary thin-section analyses of Torpedo jars from the Indian sub-continent (Tomber 2007: 974-975; Krishnan in Nanji 2011: 59-60; 232-237) led to the identification of distinct fabric groups with ferruginous and micaceous matrix. However, the present study has identified more fabric groups of separate origins. The results are

interpreted as products coming from multiple centres, with the same technology being used at different production centres.

BEAUJARD, Philippe

THE INDIAN OCEAN, CENTRE OF AN AFRO-EURASIAN WORLD-SYSTEM

Philippe Beaujard

In a book recently published, *Les mondes de l'océan Indien*, I have considered that at the beginning of the Common Era, developing exchanges transformed the Indian Ocean into a unified and hierarchized space, at the centre of a world-system stretching from eastern Asia to Europe and Africa. This world-system would evolve until the modern era through four economic cycles, synchronised with political, social and ideological evolutions, and often with climatic transformations. From one cycle to another, we observe a demographic upsurge, and the rise of exchange networks. The world-system favoured innovations (both technological and institutional), economic growth, market developments, state building, urbanization, and a larger trans-regional division of labour.

A global history of the Indian Ocean before the modern era, using a trans-disciplinary approach, calls into question Eurocentrism in historical research. It also sheds light on the period that would follow—the emergence of the

capitalist world-system—and perhaps provides some hints as to the possible futures of this system.

BELDADOS, Alemseged

ARCHAEOBOTANICAL EVIDENCE FOR EARLY POPULATION CONTACTS BETWEEN NORTHEAST AFRICA AND THE INDIAN SUBCONTINENT

Alemseged Beldados

Archaeobotanical investigations of edible crops demonstrate that there was contact between people in northeast Africa and the Indian sub-continent beginning around 2000 BCE. Contact between the two regions was via the Red Sea and Southwest Asia. Common edible grains that originate in Africa have their secondary center in India. In other cases, India provided the earliest domesticated morpho-type for crops whose wild progenitors (origins) were in Africa. According to archaeobotanical and ethno-botanical sources, northeast Africa in general and the highlands of the Horn of Africa in particular, are centers of diversity for crops of Indian origin. One can see a clear picture of such contacts through the study of millets. The millets are a large genera of small seeded plants within the *Gramineae* family, and include *Panicum* sp., *Setaria* sp., *Paspalum* sp., *Phalaris* sp., *Echinochloa* sp. and *Eleusine* sp. *Eleusine coracana* is a crop indigenous to the highlands of Ethiopia. India is considered to be a secondary center for the evolution of this crop, and it has been hypothesized that the crop was

taken to the Indian sub-continent some 3000 years ago. Sorghum and bulrush millet are also thought to have been transported during this time. *P. glaucum* is popularly known as bulrush millet or pearl millet, and it grows in the semi-arid regions of Africa and India. The crop likely originated in Africa, but in India it currently possesses the fourth largest crop yield after rice, sorghum and wheat. *Panicum* is another variety of millet within the *Gramineae* family. It has many diploid and tetraploid varieties in Asia, and one of its species, *Panicum miliaceum*, has been cultivated from ancient times. It is thought that this species was first domesticated in East Asia, although it is difficult to pin point its probable progenitor. Some researchers argue that it might have originated in Africa. Grewia, bicolor Juss. and cowpea (*Vigna unguiculata*) are other less common edible crops that originate in Africa and are first found in domesticated form in the Indian subcontinent.

BLUE, Lucy

SEWN BOAT TECHNOLOGY OF THE INDIAN OCEAN

Lucy Blue

Planked boats have been fastened by sewing and lashing techniques over extensive periods of time throughout the Indian Ocean. This paper will explore the context of the breadth and depth of sewn boat construction through the lens of maritime ethnographic enquiry, the survey of traditional boats that are still built and used, as well as by

examining the available archaeological, textual and iconographic evidence. Whilst direct evidence is limited, an attempt to analyse comparative sewn boat technologies could provide an insight into changing maritime traditions across the breadth of the Indian Ocean over time.

BOHINGAMUWA, Wijerathne

MANTAI: LOOKING EAST OR WEST?

Wijerathne Bohingamuwa

The geographical position of Sri Lanka along a major pre-modern Indian Ocean navigational route, as well as the island's proximity to its giant neighbour, India, meant that this country was open to a constant and wide range of external interactions and influences throughout its history. This is attested to not only by local and foreign historical narratives, but also by material remains recovered in Sri Lanka. Together with internal dynamics, the interactions and influences brought about by long distance trade were responsible for shaping the cultural and historical trajectory of the island. Research conducted to date suggests that Sri Lanka maintained extensive links with both India and the eastern Indian Ocean region, including China in particular, while experiencing comparatively limited interactions with the regions in the Western Indian Ocean.

Results of quantitative analyses of ceramic material excavated from the ancient seaport of Mantai/ *Mahatittha*, located along the north-western coast of Sri Lanka, suggest

the need to reconsider this traditional model. Mantai was historically the best-known seaport in ancient Sri Lanka and was linked to trading markets and seaports in the Indian Ocean region from the mid-first millennium BC. It remained the main seaport of the capital, Anuradhapura, for over fifteen centuries. While enabling the transshipment of cargo coming from eastern and western regions of the Indian Ocean, it also functioned as an urban centre and a production site for beads, glass, bangles, and ceramics, and perhaps for processing pearls for trade. Analysis of cultural material from Mantai clearly demonstrates Sri Lanka's active participation in the trade and communication networks that were operating in the Indian Ocean region from the middle of the first millennium BC.

BOIVIN, Nicole

ANCIENT BIOLOGICAL EXCHANGE

Nicole Boivin

Globalisation tends to be seen a contemporary phenomenon, and one that has not only accelerated communication and travel, and intensified economic integration, but also increased rates of biological species exchange, with potentially dangerous consequences. Biological exchange, like other aspects of globalisation, is nonetheless an ancient process, and one whose intensification dates back to the origins of the first cities and long-distance trade networks. Species were translocated over often substantial distances through

human agency both intentionally for a wide variety of practical, aesthetic, culinary, political and religious uses, and unintentionally, as hitchhiking commensals, invasive species, diseases and disease vectors. Indeed, with the increased commercial and political integration of the late first millennium BC and early first millennium AD, the number of long-distance translocated species across the Old World becomes truly staggering. As a key arena of early cultural and commercial exchange, the Indian Ocean has offered a context for a significant number of these translocations. While some of them had negative consequences for biodiversity and human health, these translocations also helped shape ecosystems that were in many cases significantly enriched and resilient environments for human habitation. These observations of the ancient past have implications for how we understand globalisation today, and the associated threat of introduced species and diseases in the contemporary world.

CAMPBELL, Gwyn

AFRICA IN THE INDIAN OCEAN WORLD IN THE FIRST MILLENNIUM CE

Gwyn Campbell

Conventional Eurocentric histories portray sub-Saharan Africa as largely isolated from major historical developments elsewhere in the world until the onset of modern European colonialism in the late nineteenth century. Until then, Black Africans were viewed as passive

victims of external forces, and the major contribution of sub-Saharan Africa to global history was the export of slaves and animal products, notably ivory. Asia-centric histories have largely accepted the conventional Eurocentric view, but the latter has recently been challenged by historians of Africa. This paper reviews the role of Africa and Africans in the Indian Ocean world in the first millennium CE. It examines the debate over the role of indigenous African and exogenous factors in the rise of the Swahili coastal cities, the interrelationship between the Swahili, Great Zimbabwe and early Malagasy civilizations, and their significance to the wider dynamics of Indian Ocean world history.

CAMERON, Judith

CLOTH AND IRON ACROSS THE BAY OF BENGAL

Judith Cameron

Archaeological textile research can offer a unique source of data to enable the movement of prehistoric groups and their technologies in the early Indian Ocean to be traced. Reconstructions of pre-1000 CE interaction are made possible because of marked regional differences in textile technology discernible in the archaeological record. This paper takes a technological approach and uses spinning tools to reconstruct the diffusion of iron and cloth across the Bay of Bengal to central Thailand during the Iron Age.

**THINK GLOBALLY, ACT LOCALLY? EXCHANGE
AND SOCIO-POLITICAL DEVELOPMENT IN
NORTHWEST CAMBODIA AS VIEWED THROUGH
STONE AND GLASS BEADS**

Alison Carter, Dougald O'Reilly & Louise Shewan

Recent work examining the distribution of stone and glass beads in mainland Southeast Asia has highlighted the diverse sets of exchange networks in time and space during the Iron Age period. Examinations of bead collections from mortuary contexts and the exchange of specific bead types amongst geographically restricted communities have also underscored the importance of regional exchange networks during this period. In this paper, I wish to focus on a group of sites in northwest Cambodia in order to understand how these inland sites were participating in broader exchange networks within Southeast Asia and between South Asia and Southeast Asia. This paper will focus on an analysis of bead collections primarily from mortuary contexts in order to identify regional patterns of exchange, as well as connections to broader networks.

Additionally, we wish to explore the nature of bead exchange and the role of people in inland communities in this process. Examinations of burials from sites in northwest Cambodia show that there were several people with much higher quantities of beads in their burials than others from the same cemetery. Scholars have argued that stone and glass beads, imported from India or perhaps

made in Southeast Asia using Indian technologies, were traded to inland communities in part to cement alliances between those on the coast and those further inland (e.g. Bellina 2007: 71; Bronson 1977). Were people with high quantities of beads involved in exchange and alliance building with long-distance communities? Although there is not yet enough data to answer this question, I argue that it is important to begin considering these issues as well.

CHAISUWAN, Boonyarit

SEA LINKS BETWEEN INDIA AND SOUTHERN THAILAND IN THE EARLY HISTORIC PERIOD

Boonyarit Chaisuwan

When southern Thailand and India came into contact by sea, it was a major catalyst for rapid social and cultural change. Evidence of such contact has included finds in Thailand of both written inscriptions and pottery of Indian origin. This contact also resulted in a transition from beads made out of animal bones and shells to beads made from glass, stone, and gold. We note a transition to the skilful production of glass beads using a high temperature process not seen before in southern Thailand. Transformations at this time were not only material, however. The discovery in Thailand of religious symbols with their origins in India suggests a change in local beliefs as well. With the acceptance of Buddhism, the traditional burial practices of the local people of southern Thailand were lost. Processes of social and cultural change in the

south of Thailand in the Early Historic Period were significant, and the role of contact with India during this period in bringing these changes about appears to have been significant.

CHIRIKURE, Shadreck

1500 YEARS OF CONNECTIVITY BETWEEN SOUTHERN AFRICA AND THE INDIAN OCEAN WORLD: COMMODITIES EXCHANGE, TECHNOLOGY TRANSFER, SOCIO-POLITICAL COMPLEXITY AND EARLY GLOBALISATION

Shadreck Chirikure

Southern Africa is often depicted as a cultural backwater that, until recent times, was isolated from the rest of the world. And yet, from the second half of the first millennium AD, communities living in southern Zambezia formed a significant node in the Indian Ocean trade network. This interaction exploited the different resource gradients in various Indian Ocean rim regions, thereby establishing a vast network that spanned continents. For example, the interior of southern Africa is conventionally seen as the supplier of gold, ivory, iron and other local resources while it received a wide array of goods such as glass beads, Islamic ceramics, metalwork, and Chinese porcelain. The coastal communities at places such as Sofala acted as conduits for inward and outbound commercial traffic. Archaeological evidence from the interior hints that the connectivity intensified with time, particularly after AD

700, such that by the second millennium AD, communities in the interior responded to this globalisation by establishing higher forms of socio-political organisation. This contribution discusses within a combined material science, archaeological and historical framework, the nature of these trade and exchange relationships and their impact on local technologies, socio-political complexity and the destabilisation often associated with agents such as the Portuguese after AD 1500. The main observation is that southern Africa and the Indian Ocean world have a long history of interaction based on commodities exchange. However, the so called prestige objects from the Indian Ocean world passed through a cultural filter resulting in a limited inventory of commodities being accepted into the local system. Not surprisingly, southern African communities have been labelled as conservative owing to their unwillingness to adopt ideas and technologies from the Indian Ocean world.

CROWTHER, Alison

TRACING SOUTHEAST ASIAN CONNECTIONS IN MADAGASCAR THROUGH PREHISTORIC CROP TRANSFERS

Alison Crowther, Solomon Pomerantz, Dorian Fuller, Leilani Lucas, Chantal Radimilahy, Henry Wright, Mark Horton & Nicole Boivin

The Southeast Asian settlement of Madagascar is a major paradox in the archaeology of the Indian Ocean. Despite

being well documented by linguistic, biological and cultural evidence, decades of archaeological research has failed to recover any substantive evidence for early Indonesian connections on the island. One potentially critical line of research that has been largely ignored to date is the remains of food plants and arable weeds that were introduced as part of this migration. The most important of these include various vegetative crops (e.g., banana, taro and yam), as well as Asian rice. Oxford's Sealinks Project recently undertook renewed excavations at several early occupation sites on Madagascar with the explicit aim of recovering archaeobotanical evidence of these crop transfers. We present the preliminary results of these analyses, and contextualize them in light of broader archaeobotanical and culinary patterns from across East Africa and the Comores, highlighting major differences in the past foodways of these regions. We argue these differences represent deeply embedded cultural values and food preferences, which in the case of Madagascar reflect strong Southeast Asian influences during its early settlement phase.

DENHAM, Tim

**ANCIENT PLANT DISPERSALS AND THE
CONSTRUCTION OF TRADITION IN THE INDIAN
OCEAN**

Tim Denham, Haripriya Rangan, Edward Alpers,
Judith Carney & Christian Kull

Numerous plants were moved around the Indian Ocean before the advent of western European voyagers. In this paper, the focus is upon the ways in which certain plants that were exchanged westward – such as the banana (*Musa* spp.), taro (*Colocasia esculenta*) and the greater yam (*Dioscorea alata*) – became embedded in the cultures of different groups around the Indian Ocean. The degree of embeddedness of plants in oral traditions and customs is used to shed light on the temporal depth of these plants in different regions, as well as to highlight the role of food in structuring everyday life (after Braudel). Here two entwined aspects of crop diffusion are considered: the exchange of plants and their integration into cultivation practices; and, the ways in which plants were also translated into new cultural milieu. These embedded plant histories are intended to provide insights on more ancient exchanges, for which there is limited comparable information.

DUSSUBIEUX, Laure

**SMALL ORNAMENTS AND LONG DISTANCE
TRADE: GLASS BEAD CIRCULATION AROUND
THE INDIAN OCEAN TRADE**

Laure Dussubieux & Chapurukha Kusimba

With the exception of the Yoruba glass beads, most of the glass material in Sub-Saharan Africa that predates European arrival was imported. Glass beads are durable artifacts that were traded over very long distances. A

symbol of wealth and status, beads transmit social and cultural messages. They react in a very sensitive way to political events that impact their trade networks or economic changes that affect the people that procure and use them.

We used glass beads found at different Kenyan sites to reconstruct trade interaction along the east coast of Africa during the second millennium CE. Approximately 140 glass beads dated from the 11th to the 18th centuries CE were analyzed using laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS). Pre-European glass compositions indicate several sources for glass beads. By comparison with data available for other African regions, we will discuss the distribution and the chronology of the different types of glass beads and interpret them in terms of changing patterns of intra and inter-regional exchanges.

EAGER, Heidi

THE HOUSE SHREW *SUNCUS MURINUS* AS A BIOPROXY IN THE WESTERN INDIAN OCEAN

Heidi M. Eager, Arden Hulme-Beaman, Alexandra Trinks, Steven Goodman, Michel Pascal, Jean-Marc Duplantier, Nicole Boivin, Atholl Anderson, Keith Dobney, Greger Larson & Jeremy B. Searle

Biological proxies are increasingly used in historical inference and can be considered 'living artefacts'. The

house shrew *Suncus murinus* is a novel bioproxy that has likely achieved its current widespread distribution through human agency. Using mitochondrial genetic markers of over 150 modern and museum specimens, we trace the colonisation history of the house shrew throughout the Indian Ocean, with a focus on island introductions, particularly Madagascar and Reunion. We found a number of geographically restricted lineages that are likely the result of human introductions. Island colonisations are often established from single introduction events that may be of ancient origin.

FRAZIER, Jack

IN SEARCH OF THE MOUNTAIN TORTOISE: CHELONIAN LEGACIES OF PROTO- GLOBALISATION?

Jack Frazier

The *Periplus Maris Erythraei* provided geographic, cultural, and commercial advice that promoted a trade network extending from Africa to China. Despite the high value of ivory, frankincense, myrrh, and other well know trade items, the most commonly mentioned commodity in this two thousand year-old traders' handbook was tortoiseshell, the external, keratinous scutes of the hawksbill sea turtle. The *Periplus* presents information on tortoiseshell coloration and quality, as well as hunting methods and other details that show the importance of this item. Clearly, before the *Periplus* was written, the market, "supply and

demand”, for this luxury article had advanced toward globalisation in this vast region.

The importance of the tortoiseshell market suggests that ancient populations were substantially greater than in modern times; the hawksbill is categorised as “critically endangered” today. In addition to hawksbill scutes, the *Periplus* mentions scutes of the “mountain tortoise”, a chelonian of unknown identity, but evidently a land tortoise. Diverse interpretations of locality names in the *Periplus* place the “mountain tortoise” on Madagascar or Zanzibar-Pemba or elsewhere off the coast of Africa. There may never be agreement on the present-day equivalent of “Menuthias Island,” where these animals reportedly occurred. Moreover, there are various enigmas regarding land tortoises in the western Indian Ocean, where they were widely distributed on remote, oceanic islands. Madagascar was evidently a centre of radiation and subsequent source of colonists to islands north and east. Yet, no native tortoises are known from the Comores, where a Malagasy species was imported, apparently for food.

Questions abound. If tortoises colonised the Mascarenes and Seychelles from Madagascar, why not Comores? Did pre-Islamic Comorians exterminate their native tortoises? Did they have a special cultural relationship with these chelonians that prompted continued exploitation? How did the proto-globalised trade in a sea turtle relate to ancient human-tortoise interactions?

**ORYZA SATIVA IN EAST AFRICA: SOCIAL
HIERARCHY AND DIFFUSION TO AND WITHIN
CONTINENT**

Erik Gilbert

The arrival of rice in East Africa and its subsequent dispersal into the interior follows a very different pattern than other Asian crops. Taro and bananas seem to have made a more or less unobstructed march east to west across the continent. By contrast, rice, which was present in a few locations on the coast by at least 800 CE and a major crop for some Swahili towns by 1000, appears not to have reached the river valleys of the interior of modern Tanzania until the early 19th century. It took roughly a thousand years for rice to move the 250 miles from the coast to the Kilombero valley where it is now widely cultivated. This paper attempts to do two things. First, using genetic evidence obtained and analyzed in collaboration with a group of researchers at the USDA-ARS Dale Bumpers National Rice Research Center, I make a case that the *sativas* of East Africa probably derive from two separate flows of genetic material. One of these is almost certainly from Southeast Asia and the other (less certainly) from South Asia. The genetic evidence also shows that East African *sativas* are also quite distinct from those of West Africa and that the *sativas* of West Africa probably represent a separate introduction rather than a trans-continental diffusion from the east. More conventional historical and linguistic evidence also indicate

that rice was new in the Tanzanian interior in the 19th century. Second, building on the work of Jeff Fleisher and Sarah Walshaw, who have done archeological work on the Swahili coast that looks at the Swahili during their transition to hierarchical society, along with documentary and ethnographic evidence from the 19th century, I argue that spread of rice to the coast and later into the interior is in large part a consequence of the emergence of social hierarchies that result from trade. Rice seems to have played a role in the feasting culture that was part of the theatre of hierarchy on the coast. Rice was so slow to diffuse into the interior and did not do so until 19th century trade routes created conditions that were parallel to those of the Swahili c. 1000 CE when they embraced Indian Ocean trade, developed towns, accepted Islam, and began cultivating rice. The slow spread of rice in East Africa suggests that, at least in some circumstances, the diffusion of rice is less dependent on suitable environmental conditions and more dependent on social and political conditions.

GILBOA, Ayelet

**ANALYTICAL EVIDENCE FOR SPICE TRADE
BETWEEN SOUTH ASIA AND THE LEVANT IN
THE EARLY IRON AGE**

Ayelet Gilboa & Dvory Namdar

In our paper we present the results of residue analyses performed on small clay flasks that were common in the

11th–9th centuries BCE in Phoenicia, in other Levantine regions and in Cyprus. Their shape, decoration and distribution suggested that they probably contained precious liquids and that they were part of an extensive commercial trade network. We analyzed the lipid contents of 26 such flasks from five archaeological sites in Israel, using gas chromatography coupled with mass spectrometry (GC-MS). In ten flasks, the molecule cinnamaldehyde was well preserved, indicating that presence of cinnamon. We argue that the cinnamaldehyde does not originate from depositional or post-depositional contamination. Since in antiquity the various cinnamon species grew only in South and Southeast Asia, these findings are the first indication of spice trade between this region and the 'west' at such an early date. Other compounds hint at the presence of nutmeg, but they are less conclusive.

GOODMAN, Steve

THE HISTORY OF MAMMAL INTRODUCTIONS TO ISLANDS IN THE WESTERN INDIAN OCEAN

Steven Goodman

The purpose of this presentation is to conduct a review of the land mammals introduced to different islands in the western Indian Ocean. While I focus largely on Madagascar, details are presented for the Comoros and Seychelles archipelagos, as well as the Mascarene Islands.

Particular attention is given for each organism to the period of introduction, current distribution, habitat preferences and types of diseases they carry. Further, when data are available, details are highlighted on molecular genetic work done at a regional level to examine source areas and the phylogenetic placement of these different introduced populations. The principal theme is to examine the role of human translocation through time in the introduction of these different mammals, highlighting their probable continent of origin.

GRATUZE, Bernard

SOUTH ASIAN GLASS BEADS IN WESTERN EUROPE IN THE EARLY MIDDLE AGES (5TH-8TH CENTURIES CE)

Bernard Gratuze, James Lankton, Constantin Pion, Dominique Poulain, C. Sculler & Torben Sode

Recent chemical analyses of two groups of glass beads excavated from Early Middle Age sites in France and Denmark have revealed for the first time the presence of South Asian glass beads in Western Europe. The first group are tiny (less than 1.5 mm diameter) glass beads recovered from Merovingian (mid-5th/6th century CE) graves at Saint-Laurent-des-Hommes (Dordogne, France), with the high-alumina soda glass m-Na-Al 1 pattern (Dussubieux et al. 2010) typical for small drawn 'Indo-Pacific' beads produced in southern India and Sri Lanka

from the 3rd century BCE through the 7th century CE. The second group are larger (ca 10-12 mm diameter) opaque red or orange barrel-shaped beads found in early 7th century graves on the island of Bornholm and in 8th c. excavations at Ribe (Denmark). Large numbers of this type of beads were also discovered in several Scandinavian sites dated from the early 7th century, e.g. at Helgö in Sweden where a Buddha statue and cowries shells were found in the same levels. While other analysed beads from this period were made from recycled Roman glass, these beads differ from all known Western European glasses in both chemical composition and colouring recipe, being similar to, but not identical with, much earlier South Asia examples.

The presence of these glass beads is new evidence for trade relations between Western Europe and the Indian Ocean region during the 5th to 8th centuries. While previous work on South Asian garnet inlays in Merovingian jewellery (Greiff 1999) provides additional background, what is new about the glass bead evidence is that it suggests that western European-Indian Ocean long distance exchange involved more than rare luxury goods such as silks and precious stones, and that many other products may have been traded between Europe and South Asia in the Early Middle Ages.

References

Dussubieux, L., Gratuze, B. & Blet-Lemarquand, M. 2010. Mineral soda alumina glass: Occurrence and meaning. *Journal of Archaeological Science* 37(7): 1646-1655.

Greiff, S. 1999. Naturwissenschaftliche Untersuchungen zur Frage der Rohsteinquellen für frühmittelalterlichen Almandingranatschmuck rheinfränkischer Provenienz, *Jahrbuch des Römisch- Germanischen Zentral Museums Mainz*, 45(2): 599-645.

GREEN, Monica

FROM ENZOOTICS TO PANDEMICS: AFRICAN AND ASIAN ORIGINS OF DISEASE BEFORE 1000 CE

Monica H. Green

Knowledge of the history of infectious diseases has grown enormously in less than a decade and a half, largely because developments in molecular genetics have allowed, for the first time, systematic reconstruction of the evolutionary histories of pathogenic organisms. Study of the histories of major human infectious diseases in a global framework yields two striking patterns for the period prior to c. 1000 CE. First, the very ancient human diseases (with origins extending back into the Pleistocene, from before hominins were “human”) all seem to have arisen and established their host-parasite relationships in Africa. Specifically, the two major forms each of tuberculosis, leprosy, and malaria are all yielding evidence of close connections with the major primates.

In contrast, the two major diseases that arose in the period of great Old World urbanization starting around 3000 BCE—smallpox and plague, both of which have epidemic

potential—implicate rodents as the key players of zoonotic transfer. True, they are very different diseases. Smallpox, perhaps the result of a single or a least limited zoonotic transfer in the Horn of Africa (with the crucial intermediary of the camel, recently imported into Africa from Asia), became an obligate pathogen, circulating only in humans. Plague's history, in contrast, began in the completely different physical environment of the Tibetan Plateau, and it has remained one of constant trans-species transmission. Critically, what links the two diseases—both of which are quick killers rather than chronic (or serially acute) diseases like the others—is that they rely on networks of long-distance trade for their sustenance.

All five diseases came to play major roles in human health in both Africa and Asia. But there are still major holes in the narratives of all of them, both before and after the year 1000 CE. This paper will offer a synthetic state-of-the-field assessment of what is now known or postulated about the origins of these diseases and what an integrated, multi-disciplinary approach to their histories can offer. Work on climate history, animal evolution, and human migrations is not simply “proxy data,” but a crucial component that will be necessary to explain how all five of these diseases became truly global.

GENETIC DIVERSITY OF TARO (*COLOCASIA ESCULENTA* (L.) SCHOTT) IN AFRICA AND IMPLICATIONS FOR MARITIME CONTACTS IN THE ANCIENT WORLD

Ilaria Maria Grimaldi, Nicole Boivin & Robin Allaby

The Indian Ocean has for many millennia represented an important maritime arena for travellers, traders and others who took to the sea and helped to establish links between distant lands, peoples and cultures. Archaeological, historical, linguistic, and ethnographic evidence represent key sources of information about these early connections, but they are increasingly joined by data from a very different source: DNA. Recent work has targeted not only human genetic sequences, but has also explored the phylogeography of key translocated species. Our work is focusing on one Oceanic/Southeast Asian crop that came to be widely distributed in the Indian Ocean, the staple crop taro (*Colocasia esculenta* (L.) Schott). The use of this crop in antiquity is documented at numerous sites in Island Southeast Asia and Oceania. Much less is known about the early use of taro in Africa and the Mediterranean region, where it is found both in feral form and under cultivation, despite the fact that taro is a staple crop across much of sub-Saharan Africa. In this paper, we will present the results of genetic analyses performed on modern samples of taro collected from Africa and other countries around the Indian Ocean rim. By integrating these findings with

data collected during ethnographic research, we will explore the implications for movement of the plant in the Indian Ocean and in particular contribute to a better understanding of the history of taro in Africa.

GUPTA, Sunil

THE EASTERN INDIAN OCEAN INTERACTION SPHERE IN ANTIQUITY (2000 BC-AD 1000)

Sunil Gupta

In the emerging area of Indian Ocean archaeology, the western part of the ocean, comprising the lands around the Red Sea, the Gulf of Aden, the Arabian Sea and the east African coast has attracted more scholarly attention than the eastern part of the ocean. This is evident in the spread of articles in the proceedings of major seminars on the Indian Ocean World in the last two decades (Reade 1996; Ray and Salles 1996; Gupta 2002). The eastern Indian Ocean region comprises the lands around the Bay of Bengal, Southeast Asia up to the furthest spread of the Indonesian islands, the northern Australian coast and the South China Sea littoral. This vast area has a vibrant tradition of archaeological research covering prehistory through history. Contributions to the *Journal of Indian Ocean Archaeology* on the impact of climate change on the hominid inhabitants of Indonesia and the discovery of ancient Indian beads in Cambodia signal a new interest in situating specific research within a broader framework. Peter Bellwood's many years of work on the spread of early

farming cultures across mainland and island Southeast Asia (Bellwood 1992) and Charles Higham's consolidations of Southeast Asian Archaeology (Higham 1989) have contributed to a big picture view of the eastern Indian Ocean region. Himanshu Prabha Ray has written extensively on India-Southeast Asia connections, expressive of a long historiographical tradition (Ray 1991).

However, there is now an increasing appreciation that the eastern Indian Ocean region was also an interactive sphere facilitating exchange of people, things, ideas and technologies much beyond its outliers, towards the western Indian Ocean and the Red Sea/Mediterranean in the west and to the Far East and the Pacific regions to the northeast and southeast. I have endeavoured to articulate this interactivity by investigating long distance bead exchange between Yayoi Japan and the eastern Indian Ocean in the BC-AD transition (Katsuhiko and Gupta 2000), the idea of a Bay of Bengal Interaction Sphere from 1000 BC – AD 500 (Gupta 2005) and the possibilities of a cowry/spice exchange network connecting the eastern Indian Ocean to south China through corridors in the Indian northeast in the first millennium AD (Gupta 2006). In this paper, I shall attempt to consolidate my writings on different interactive spaces within the eastern Ocean sphere and present a fresh view on the operation of long distance networks in broad space-time contexts in this vast region.

References

Bellwood, P. 1992. Southeast Asia before History. In *Cambridge History of Southeast Asia* Vol. I (N. Tarling ed.), pp. 55-136. Cambridge: Cambridge University Press.

Gupta, S. (ed.) 2002. *The Indian Ocean in Antiquity*. Special Volume of *Man and Environment* 28(1): 1-24.

Gupta, S. 2005. The Bay of Bengal Interaction Sphere (1000 BC-AD 500). *Bulletin of the Indo-Pacific Prehistory Association* 25: 21-30.

Gupta, S. 2006. Indo-Chinese crossroads: The Assam-Yunnan axis in the Indian Ocean Interaction Sphere (1st-5th century CE). *Journal of Indian Ocean Archaeology* 3: 90-107.

Higam, C. 1989. *The Archaeology of Mainland Southeast Asia: From 10,000 BC to the Fall of Angkor*. Cambridge: Cambridge University Press.

Katsuhiko, O. & Gupta, S. 2000. The Far East, Southeast and South Asia: Indo-Pacific beads from Yayoi tombs as indicators of early maritime exchange. *Journal of South Asian Studies* 16: 73-88.

Ray, H.P. 1991. In search of Suvarnabhumi: Early sailing networks in the Bay of Bengal. *Bulletin of the Indo-Pacific Prehistory Association* 10: 357-365.

Reade, J. 1996 (ed.) *The Indian Ocean in Antiquity*. London.

HAALAND, Randi

INDIAN IMPACTS ON MEROITIC CIVILIZATION: THE MOVEMENT OF CRAFTSPEOPLE AND SYMBOLIC STYLES

Randi Haaland

At the ancient city Naqa, east of the Nile at the head of the trade route to the Red Sea port of Adulis, a number of enigmatic engravings on temple walls and pylons have

been found. They depict the so-called Lion God Apedemak, a god not found outside the “Island of Meroe”. On the pylon, Apedemak is represented by the head of a lion on a human torso with the lower extremities of a python emerging from a lotus flower pedestal. At the nearby ritual site Musawwarat as Sufra, Apademak is represented with three lion heads and four arms. On the engravings are also found Egyptian hieroglyphs. It is, however, difficult to see the configuration of elements associated with Apademak as variations on symbolic themes found in ancient Egypt. In addition to Egyptian elements, many symbolic features (the lotus, python, multiple arms and heads, etc.) of the Apademak engraving show such striking similarity to Indian iconography that is tempting to also search for Indian connections.

The Merotic state controlled trade routes between the two north-south trade ‘corridors’, the Nile and the Red Sea, bringing African goods to the port of Adulis where they became elements in the Ptolemaic-Roman maritime trade between the Red Sea and India. Trade goods, e.g. cloth and spices, from India are examples of possible imports to Meroe. I shall argue that the Indian trade linkage also mediated symbolic linkages like those manifested in the Apademak engravings. The diffusion of symbolic elements might have been brought about by itinerant craft specialists moving between politico-religious centres.

**LESSONS FROM THE PAST FOR THE FUTURE OF
THE INDIAN OCEAN**

J.D. HILL

At the beginning of the 21st century, the Indian Ocean is increasingly both the focus of academic research and conferences, but also a core region of interest for military strategists, business leaders and politicians. That academic study of this ocean has grown at a time when it is (once again) the principle artery for the world's trade and a key arena where the new geopolitics of our age are being played out is probably not a coincidence. Yet what is the relationship between the two? Does the study of this ocean's deep history have lessons for the present, and what responsibilities are there archaeologists, geneticists and others in how they discuss and interpret the past? Does, for, example, the increasing evidence for the deep history of the connections around the Indian Ocean provide a different or better perspective from which to look at the present; and how helpful or even dangerous is it to describe these connections as proto-globalisation?

HORTON, Mark

THE PREHISTORIC GLOBALISATION OF EAST AFRICA

Mark Horton

Archaeologists and historians have traditionally viewed sub-Saharan Africa as a huge landmass with few or any connections with the outside world until the arrival of Arab and European colonial and trading activities. Recent work is overturning these old views, and showing the scale of African connections across the Indian Ocean during both pre and proto-history. The lecture will focus mostly on the maritime connections of eastern and southern Africa and examine the cultural and economic impact to suggest that many of the well established narratives of African cultural history may require revision in the light of this evidence. The lecture will include evidence from the most recent Sealinks fieldwork from the Tanzanian islands of Pemba, Mafia and Zanzibar, as well as Madagascar and the Comores, in addition to comparisons from other sites around the Indian Ocean.

JANSEN VAN RENSBURG, Julian

FISHERMEN ON SOCOTRA: A PLURALITY OF TRADITION

Julian Jansen van Rensburg

The island of Socotra is situated approximately 135 nautical miles northeast of Cape Guardafui, Somalia and 205 nautical miles south of Ras Fartaq, Yemen. Here, at the entrance to the Gulf of Aden and the Red Sea, it acts as sentinel, victualling station and navigational waypoint for the intercontinental maritime trade of the Indian Ocean. Moreover, due to Socotra's rich natural resources of aloes, dragon's blood and frankincense, it has attracted the interest of rulers, settlers and traders for millennia.

The rulers, settlers and traders coming to Socotra have tended to remain along the coastal fringe, where they have established themselves over several centuries. Consequently, the coastal population in the past and present is made up of an eclectic mixture of ethnicities from Africa, India and Arabia. While a large number of these settlers were engaged in trade, an even greater number became fishermen. In this paper I look at the factors that influenced their becoming fishermen, where they came from, and what cultural traditions and objects they brought with them. I will address several important themes having to do with the formation and transmission of maritime traditions, the adoption and abandonment of maritime objects, in particular vessels, and the interconnectivity between coastal communities. I shall demonstrate the necessity of undertaking a multi-disciplinary approach that incorporates history, archaeology, ethnography and the environmental sciences, and how this helps one to understand the inter-related and mutual translation of tradition. Finally, I show how this approach provides a holistic narrative that can be used to gain a deeper understanding of the role of fishing

communities in the seafaring traditions of the Indian Ocean.

KENNET, Derek

**THE DYNAMICS OF SETTLEMENT AND
POPULATION IN EASTERN ARABIA C. 4TH
CENTURY BC - 4TH CENTURY AD**

Derek Kennet

This paper will examine the archaeological evidence for population, activity and economy in a region that is not mentioned by the *Periplus* but for which a good data set is now available. The argument will be made that the 800 years under consideration witnessed a very marked increase (with fluctuation) of population, settlement and other human activity. Having briefly presented the evidence for this, the paper will discuss the possible reasons behind it – local factors, regional factors, climate, and trade – and in so doing will set out some of the problems that we face when examining issues of economic inter-action and inter-dependence in what are effectively pre-historic periods.

**ISLAMIZATION AND INDIAN OCEAN
GLOBALISATION: NEW AGENCIES AND
IDENTITIES (7TH-10TH CENTURIES CE)**

Elizabeth Lambourn

The expansion of Islam across Eurasia from the seventh century CE is arguably one of the most important and prolonged instances of cultural and institutional movement in world history, and one that was, from the start, profoundly engaged in the Indian Ocean. Any study of processes of globalisation of the Indian Ocean during the later first millennium CE must address its relationship to this phenomenon and yet, generally speaking, the chronology, geography and politics of early Muslim conquests and settlement are poorly studied, leading to simplistic, binary periodizations and broad assumptions about the agency of “Islam” in this maritime environment.

This paper sets out to complicate our understandings of the sequences and character of Islamization in the Indian Ocean from the mid-seventh to tenth centuries, and its connection to processes of globalisation. In this paper I question existing narratives of peaceful mercantile agency and explore counter-narratives, which tie the Indian Ocean into larger processes of Arab conquest and territorial expansion. Controversially, I question the very primacy of Islam in this environment at this period, highlighting early Islam’s own reticence towards non-Arab conversions, legal objections to Muslim settlement outside the *dar al-islam*,

and the agency of the monsoon system itself in sheltering non-Muslim West Asians from later conversion processes in the Islamic empire.

This analysis helps us to decouple Islamization from globalisation. Islam per se did not foster greater connectivity or cosmopolitanism in the Indian Ocean, arguably in the very earliest periods it often did the reverse; rather it was the economic, financial, political, and social structures which developed within this new and vast Islamic empire which contributed most significantly to globalisation processes.

LANKTON, James

**AGENTS OF EXCHANGE AND TECHNOLOGY
TRANSFER: NEW INSIGHT FROM GLASS
COMPOSITIONAL DATA**

James Lankton & Bernard Gratuze

During the past 10 years, scientists led by Bernard Gratuze (Orleans) and Laure Dussubieux (Chicago) specializing in the chemical analysis of early glass have collected enormous amounts of data from sites in South and Southeast Asia, with well over 4000 analyses to date. Although exciting new information continues to emerge, with examples from both Europe and Africa to be presented at this conference, a key question is how the data already available can be used to approach such topics as the economic and social changes that led to the emergence

of glass objects and technology at many sites around the Indian Ocean, and who were the agents of exchange and technology transfer?

While glass technology developed as early as the 6th century BCE in the Ganges Valley, the actual dissemination of the products of this technology, mainly beads, bangles and small ornaments, as well as the technology itself, occurred only in the 4th to 2nd century BCE, with increasing urbanization, and, at least coincidentally, the introduction of the new religious forms encouraging both religious and mercantile expansion. At this time, glass spread from the Ganges Valley to the northwest, and, to be discussed in more detail, to the south and southeast. The mechanisms of this spread appear to differ from one area to another, with glass compositional and technological evidence suggesting that the earliest glass object production in Southeast Asia, as at Khao Sam Kaeo and Ban Don Ta Phet in Peninsular Thailand, was the result of North Indian craftsmen working on site using glass imported as raw material from the Ganges Valley. In contrast, early glass workers in southern India and Sri Lanka, at about the same time, used glass made from traditional recipes but local raw materials, coupled with innovations in technology and a new emphasis on small drawn bead production.

**NOMADS, FARMERS, FISHERS, TRADERS:
ARCHAEOLOGICAL PERSPECTIVES ON LOCAL-
GLOBAL IMPACTS AND INTERACTIONS IN
SOUTHWEST ARABIA**

Krista Lewis

This paper examines interior-coastal socioeconomic dynamics within southwest Arabia and how they were impacted by and contributed to possible processes of early globalisation in the Indian Ocean. Southwest Arabia is a vital locus of investigation not only because of its key geographic location, but also due to its high population density, cultural diversity, agricultural potential, and abundance of valued natural resources including the highly sought-after commodity frankincense. The region exhibits a striking diversity of local lifeways across varied environmental zones, with equally unique responses to the pulls and pressures of wider socioeconomic forces from throughout the Indian Ocean. I will present archaeological evidence for cultural contacts and contrasts across southwest Arabia from late antiquity through the early centuries of the spread of Islam, highlighting the results of recent research in highland Yemen and in the Dhofar province of southern Oman, including the foundation of the port city of Al-Baleed.

**SKIPPERS AND ENTREPRENEURS: THE
SHIPMASTERS OF PRE-MODERN INSULAR
SOUTHEAST ASIA**

Pierre-Yves Manguin

Shipmasters played a crucial role in long distance exchange networks of the Indian Ocean, as evidenced by early historic and medieval epigraphic and textual sources. In Insular Southeast Asia, their action is moreover intimately associated with the state formation process of coastal polities. Between the 5th and the 18th century, their position is documented in local epigraphy, as well as in Malay, Chinese, Arabic and Indian textual sources. Owners of trading ships and investors in part of their cargoes, these characters appeared under designations of various origins, which all partook of one single semantic field: *mahānavika* (Sanskrit), *puhawang* (Austronesian), *nakhoda* (Arabo-Persian). They belonged to a high status, non-noble class; alongside the “sea merchants”, they formed a social group that connected local political power to networks of overseas relationships and exchange, the very foundation of the merchant economy of coastal polities. As such, they were agents of early globalisation of the ancient world. Their distinct position within the complex societies of Insular Southeast Asia bring the latter into the mainstream of Indian Ocean history.

**PLINY, AL-KINDI AND HEAVY METAL: THE CASE
FOR A STEEL ROAD OF THE SEA**

Mats Mogren

With a point of departure in Himanshu Prabha Ray's statement that it is high time to rid ourselves of the notion that Indian Ocean trade was confined to light-weight, high-value goods only, a pattern of quality-conscious trade in steel products, spanning the entire first millennium CE, is outlined.

Ancient and Medieval written sources mentioning iron and steel export from South Asia are juxtaposed with the increasing archaeological and archaeo-metallurgical evidence for South Asian iron and steel production. The focus of this presentation is Sri Lanka, which during Late Antiquity and the Early Middle Ages can be seen not only as the pivot of the Indian Ocean system, but also emerges as a very prominent production area of the period.

In the central and southern parts of the island, investigations have already revealed production on a scale that probably presupposes export, but these results must be seen as the tip of an enormous uninvestigated iceberg calling for further surveys and research.

**MARITIME TRADE IN ANCIENT KALINGA, WITH
SPECIAL REFERENCE TO THE EXCAVATIONS AT
MANIKPATANA, A PORT SITE IN ODISHA, INDIA**

Rabi K. Mohanty

The ancient coast of Kalinga formed an integral component of connecting sea and riverine trade in the Bay of Bengal. The legends, folklore and rituals associated with maritime activity remain embedded in the culture of this region to the present day. Recent excavations and explorations of Early Historic urban settlements in the coastal region of Odisha provide ample evidence of the importance of maritime trade in this region. The ports of Manikapatana, Khalka Pattana, and Palur appeared around the middle of the first millennium AD, near the openings of estuaries, lagoons and lakes. They provide insight into trade, production activities and the supply of essentials to Indian Ocean mariners. The cultural material recovered from these medieval ports, and especially from the excavations at Manikapatana, includes not only local goods (such as terracotta lamps) but also various types of smoking pipes, semiprecious stone beads, glass beads, glass bangles and shell objects originating from other parts of the country, and probably circulating as part of internal and export networks. A large quantity of fish bone, as well as iron clamps and nails used for boat building and repair, provide information on maritime activities at the sites. The presence of Chinese ceramics similar to those found at Mantai (Sri Lanka), coins of Chinese and Sri Lankan origin,

and other lines of evidence suggest contact between ancient Kalinga and Southeast Asia, China, Ceylon and South India.

MUTHUKUMARAN, Sureshkumar

**LITERARY EVIDENCE FOR THE SPREAD OF
SOUTH ASIAN CULTIVARS IN THE FIRST
MILLENNIUM BC: THE CASE OF *CUCUMIS
SATIVUS***

Sureshkumar Muthukumaran

Oryza sativa (rice), *Gossypium arboreum* (cotton) and *Citrus medica* (citrons) rank amongst the better-known cultivars that spread from South Asia to the Near East and the eastern Mediterranean in the 1st millennium BC. The westerly diffusion of South Asian cucurbits, especially *Cucumis sativus* (cucumber), remains nebulous on account of the lexicographical discrepancies pertaining to cucurbits in antiquity. A recent paper (Paris et al. 2011) has even argued that *Cucumis sativus* was absent from the Mediterranean and Near East up to AD 500. This paper will argue however for an earlier diffusion of *Cucumis sativus* in the 1st millennium BC, drawing on sources in Akkadian and Greek read in conjunction with the archaeobotanical and iconographic evidence. Arguments for the late introduction of *Cucumis sativus* are in any case invalidated by much overlooked Hellenistic fragments on gastronomy and botany which not only qualify certain cucurbits as ‘Indian’ but even recognise that their seeds were brought from

India. In the process of elucidating the spread of South Asian cultivars to the Near East and the Mediterranean we will also highlight the vibrant trade relations and modes of communications along the maritime corridor between the Persian Gulf and South Asia from the late Assyrian to Achaemenid period which has been much neglected at the expense of Indo-Hellenistic and Indo-Roman commercial exchanges.

MWACHARO, Joram

ANCIENT SEAFARING AND TRADING ACROSS THE INDIAN OCEAN REVEALED BY CHICKEN MITOCHONDRIAL DNA

Joram M. Mwacharo & Olivier Hanotte

The domestication of chicken was a major milestone in the socio-cultural and economic history of human societies. The inability of the species to fly and its dependency on humans for long-range dispersal make it a readily available biological marker to trace cultural and trading contacts between ancient centres of civilisations. Here, through a detailed phylogeographic analysis of modern domestic chicken partial D-loop and full mitochondrial DNA genetic diversity, we attempt to reconstruct ancient intercontinental maritime and terrestrial networks bordering the Indian Ocean. We propose that South East Asia was the main centre of origin of domestic chicken with no clear evidence for the domestication of the red junglefowl on the Indian subcontinent. Two major waves

of dispersion in different directions and at different time periods seem to characterize the out-of-South East Asia dispersals. One likely saw the adoption of domestic chicken along the coastal areas of the Indian Ocean, while a second wave lead to the adoption and establishment of the domestic species all across the Indian subcontinent and Africa. Our data further reveals signatures of ancient maritime routes that connected China and Sri Lanka, and, Sri Lanka and Southern Africa, as well as a trans- or Sudano-Sahelian route connecting Sri Lanka, the Horn of Africa and West Africa. These results support a complex process of global inter-connectivity and trading exchange across the Indian Ocean world.

NANJI, Rukshana

**MIGRATION AND MARITIME TRADE DURING
THE EARLY MEDIEVAL PERIOD: WITH SPECIAL
REFERENCE TO SANJAN (GUJARAT)**

Rukshana Nanji

The western seaboard of India has been one of the most active coastlines in the Indian Ocean since ancient times. Numerous ports evolved, flourished and declined during its long history. The Early Medieval period (7th to 13th century AD) was perhaps one of the most dynamic periods during which maritime trade in the Indian Ocean connected most of the seaports in the littoral. The west coast of India too played a major role in this interface, strategically located as it was between West Asia and East

Africa on the one hand, and the Far East on the other. One of the few port sites of this period to be excavated in India is Sanjan (Gujarat). Located on the north bank of the river Varoli and 5 km from the Arabian Sea, Sanjan is historically recorded as the earliest Zoroastrian Persian settlement on Indian soil. The *Kisse-i-Sanjan*, a quasi-historical Persian poem written in AD 1599, records the migration of the Zoroastrian Persians (or Parsis as they came to be called) and the story of their settlement.

Archaeological evidence provided by the WZCF excavations (2002-2004) presents a comprehensive insight into the history of Sanjan, its antiquity, migration(s), demography, economy and its social and cultural profile. Known in Sanskrit inscriptions as *Samyanapattana*, *Sanjanamandala*, *Sanjayapura*, and *Sanjjana* and in Arab and Persian sources as *Sindan*, Sanjan grew in importance from a small coastal settlement to one of the most important ports on the western seaboard, trading with the Persian Gulf on the one side and China on the other. The archaeological evidence points to a far greater antiquity than was previously suggested by scholars. The site appears to have had contacts with West Asia from a very early date and this may have been one of the reasons why the migrating Zoroastrian community decided upon this site as their settlement. The excavations brought to light a large and extensive settlement with brick-built structures, rich antiquities, ceramics from the Persian Gulf and China, glass artefacts, metal objects, coins and other archaeological material. The ceramics from this site were the topic of the author's doctoral thesis and also the official ceramic report for the excavation. Excavation of the ancient *Dakhma* and human remains within it clearly

established the Zoroastrian component of the population. Study of other historical sources such as inscriptions, literary records by Persian and Arab sailors and merchants, and epistolary sources such as the *Revayats* help to corroborate the findings of the excavations. Scientific analysis of the data along with radiocarbon and AMS dates provide a chronological framework and an insight into the emergence, growth and abandonment of a port site as well as its cultural, economic and historical profile.

OTTONI, Claudio

ANCIENT DNA FROM CATS HINTS TO EARLY TRADE IN THE INDIAN OCEAN WORLD

Claudio Ottoni, Wim Van Neer, Nicole Boivin,
Mary Prendergast, Thierry Grange & Eva-Maria
Geigl

In the last few years, biomolecular archaeology has made important contributions to phylogenetic and phylogeographic studies, which also have the potential to shed light on the history of early human societies. Cats have a particular position in human societies since they were never used as for food or transport. The beginning of the common history of cats and humans probably began with the onset of agriculture, the development of settlements and the construction of houses and farms. At this time, cats probably developed a commensal relationship with human communities. Archaeological evidence attests fully domesticated cats at least by 3,600

BP, during the Egyptian New Kingdom. A complete cat skeleton found in association with a human burial in Cyprus, around 9,500 BP, argues, however, that prior taming of cats may have taken place in the early Neolithic societies of the Near and Middle East. In the course of a phylogeographic study of the distribution of cats throughout the Holocene, we analyzed ancient mtDNA in wild and domestic cats from various archaeological sites in Europe, Southwest Asia and Africa, to investigate the past distributions of *Felis silvestris*. Here we will highlight particular results of our study and the way that data from an archaeological site in the Red Sea region point to contacts with the Indian subcontinent during Roman times.

PATERSON, Alistair

**OVER THE HORIZON: A REVIEW OF COASTAL
CONNECTIONS BETWEEN NORTHERN
AUSTRALIA AND SOUTHEAST ASIAN NETWORKS**

Alistair Paterson

Asian demand for resources in northern Australia drove connections between northern Australian indigenous peoples with island Southeast Asian societies who visited the coastline, mainly from ports such as Macassar. The fleets were more diverse, with sailors and workers from many Southeast Asian islands. These events brought to Australia new forms of material culture (such as ceramics and, possibly, new forms of boats and fishing technology)

and concepts (notably Islam) originating from Asia and the wider Indian Ocean world. The primary driver of the network appears to have been Chinese demands for trepang, delivered through island Southeast Asian intermediaries. Recent dating of images of praus (boats) in Arnhem Land suggest contact dating to at least the sixteenth century AD. In the Kimberley region, various strands of evidence include rock art, archaeological and environmental data, and coastal sites suggest human interactions with this coastline, which we hypothesise, predates those evidenced in Arnhem Land. Several different questions are significant: to what extent are changes in Kimberly in the Holocene potentially a result of forms of coastal connections? What processes in maritime societies in Island Southeast Asia drove the development of these networks? What forms of contact occurred between coastal peoples and Asian visitors? How was the enterprise of coastal voyages to northern Australia internally organised and scaled over time? Did Aboriginal people from the Kimberley return with the fleet to ports such as Macassar, as is detailed for Arnhem Land individuals? What new specialisations (e.g., certain kinds of foraging, social organisation, depictive traditions) emerge in Australia as an outcome of global connectivity and commerce?

**ORIGIN OF THE LAST HUNTER-GATHERERS OF
MADAGASCAR**

Denis Pierron, Harilanto Razafindrazaka,
Francois-Xavier Ricaut & Thierry Letellier

Linguistic and cultural evidence suggests that Madagascar is the end point of two of the greatest population diffusions due to agricultural innovation: the Austronesian and Bantu expansions. Nonetheless, hunter-gatherers continued to dwell in the south of the island up until the 16th century. Nowadays, the Mikea are the last known population in Madagascar reported to practice hunter-gatherer subsistence strategies.

In the present study, we have attempted to elucidate the dispersal of agriculture in the south of Madagascar by addressing two questions: (i) are the populations of south Madagascar descended from ancient hunter-gathers or do they derive from a recent Neolithic admixture between Austronesian and Bantu populations?; and (ii) are the Mikea a relict population of ancestral hunter-gatherers that pre-existed this admixture?

In order to answer these questions, we have performed a genome-wide analysis of individuals from the Mikea and other Malagasy populations, comparing these genomic sequences to available data collected from other African and Indonesian populations. Our results have shown that the three studied populations are derived from admixture

between the Austronesian and Bantu population gene flow. The Bantu gene flow represent at least 50% of the genetic background while the Austronesian gene flow represents around one third, likely originating from the Java-Borneo-Sulawesi area. Although the Mikea population genomes are derived from the admixture of two Neolithic population expansions, they have subsequently adopted a hunter-gatherer life-style and are one of few populations to undergo this cultural reversion.

PRENDERGAST, Mary

SPECIES TRANSLOCATIONS REVISITED: COASTAL AND ISLAND ZOOARCHAEOLOGY IN EASTERN AFRICA

Mary E. Prendergast, Alison Crowther, Mark Horton, Richard Helm & Nicole Boivin

Research on the eastern African coast and immediate hinterland has identified artefactual evidence for early long-distance movement of goods within an Indian Ocean interaction sphere, as suggested by 1st century AD written accounts. Bioarchaeological data have, until recently, been a limited part of investigations of Indian Ocean trade; however, the presence of several plant and animal species of Asian origin in eastern Africa today raises the possibility of early long-distance translocations. Current investigations of faunal remains from sites spanning the terminal Later Stone Age through Iron Age on the East African coast and islands suggest that prior proposals for species

translocation evidence must be re-evaluated in light of osteomorphological criteria for identification and new radiometric dates. The faunal data offer new insights into the subsistence activities of local agents possibly involved in long-distance trade, as well as both regional and long-distance translocations.

PRIESTMAN, Seth

**CHANGING COMPOSITION OF CERAMIC
EXCHANGE IN THE WESTERN INDIAN OCEAN,
AD 400 – 1275**

Seth M.N. Priestman

The presentation draws on the results arising from doctoral research undertaken as collaboration between the Centre for Maritime Archaeology at the University of Southampton and the Middle East Department at the British Museum. Two factors hold back the use of ceramics as a staple evidence base upon which to develop a systematic reconstruction of the long-term economic history of the Indian Ocean region: the slow adoption of quantitative finds recording; and, the inability to recognise the same varieties of pottery that occur repeatedly in different regions. The study attempts to address these issues by applying a single integrated system of ceramic classification to assemblages from East Africa, the Middle East and South Asia, and by assembling the largest possible range of quantified ceramic datasets. Information has been collected from a combination of previously

published reports, excavation archives, finds databases, and through direct recording of archived finds assemblages. In total, over 4.5 million pieces of pottery are used to chart long-term changes in the composition of ceramic exchange between AD 400 and 1275. This in turn provides a crucial index with which to examine prevailing assumptions regarding the extent of growth or continuity in India Ocean commercial development in an age where few other sources of systematic economic history survive. The presentation focuses on selected results to illustrate the key potential of integrated cross-regional ceramic research.

RAAUM, Ryan

BIOLOGICAL ANCESTRY AS AN INDICATION (OR NOT) OF CULTURAL TRANSMISSION IN THE INDIAN OCEAN BASIN

Ryan Raaum

There has been a long history of controversy regarding the development of urbanization among what we now call the Swahili populations of the East African coast. In colonial narratives, these populations were interpreted as the recipients of the civilizing influences of Middle Eastern traders and colonists. In contrast, post-colonial narratives have focused on the continuity of material culture from early pre-urban through to the later urban settlements. The new genetic data reported here support a diversity of biological ancestries. These data show distinct biological ancestries of neighbouring communities, especially in

paternal lineages. The most intriguing aspect of these results is that the communities that have been regarded as those with the greatest historical and contemporary importance (Mombasa, Lamu, Siyu, Pate) are not those with the greatest non-African ancestry. Contemporary communities with high levels of paternal non-African ancestry are historically peripheral (Ndau, Wasini). These data suggest that the archaeologically demonstrated continuity of cultural practices through time and across communities has masked diverse biological ancestries.

RADIMILAHY, Chantal

ARCHAEOLOGICAL SITES AT RIVER MOUTHS AS INDICATORS OF ANCIENT HUMAN SETTLEMENT IN MADAGASCAR

Chantal Radimilahy & Jean-Aimé Rakotoarisoa

In the last few years, we have undertaken a re-examination of ancient sources on Madagascar. This work began along the east coast, where we have implemented a long-term project for survey of river mouth archaeological site locations. In the Analanjirofo region, excavation campaigns were carried out from 2000 to 2005 (initiated by Dewar et al.). One of the major results was the identification of ancient human settlements close to major riverbanks. Remains related to the “Islamised” Rasikajy group from northeast (Vohemar), whose civilization markers are manufactured chlorite schist artefacts, have

been found. This tends to confront southward migration stories of Islamised population along the eastern coast.

New excavations are today being carried out at the mouth of the Ivondro river (Ambodisiny), south of Tamatave, in a place well known for the discovery of a large chlorite schist jar. Further south, along the eastern coast, is a village with a chlorite schist statue of a boar, whose style brings to mind ancient Chinese bronze statuettes. Beyond the stories built around this item, which became a focus of worship, it is important to explore the different locales where first settlements occurred. Some questions remain: in their myths, the population groups who migrated from the northeast consider themselves as Islamised, but why then is this boar statue worshipped, even though pig is taboo in Islamic practice? In addition, the same 'Islamised' population have integrated in their traditional rituals use of formally tabooed materials like alcohol. Who are the Rasikajy who introduced the know how for chlorite schist objects?

As a part of the collaborative Madagascar Genetic (MAGE) project, the relationship between cultural behaviour among population groups along the eastern coast of Madagascar and genetic results will also be examined.

TRAVELLING WITH THE BUDDHA

Himanshu Prabha Ray

Contemporary analysts associate globalisation with increased social interconnectedness and de-territorialization as a result of improved connectivity. This presentation attempts an assessment of this phenomenon in the context of early Buddhism as it spread across Monsoon Asia from the beginning of the Common Era onwards. A remarkable feature of early teachings of the Buddha was their trans-locality and the endorsement of the way of life of the wandering monk in search of knowledge. There are several examples of monks undertaking long and arduous journeys across the Ocean. Like other Indic religions, Buddhism had no central organization, but comprised of ordination lineages in different parts of the Buddhist world, which were autonomous and formed a part of the independent system of the production and expansion of monastic communities. While these lineages were linked in a global Buddhist inter-connected network, they continued to maintain institutional distinctiveness at the local or regional level.

Two figures loom large in this narrative: one is that of the Buddha himself and his peregrinations; and the second is the third century BCE king Ashoka whose edicts on rocks and pillars are found across the Indian subcontinent. These are not merely historical figures rooted in a specific period

of history, but are ‘alive’ and present in large parts of Asia and therein hangs a tale.

RAZAFINDRAZAKA, Harilanto

**COMPARATIVE STUDY OF THE HISTORY OF
SETTLEMENT OF MIKEA, A GROUP OF HUNTER-
GATHERERS IN MADAGASCAR THROUGH UNI-
PARENTAL VERSUS BIPARENTAL GENETIC
MARKERS**

Harilanto Razafindrazaka, Denis Pierron,
Francois-Xavier Ricaut & Thierry Letellier

The island of Madagascar lies in the western region of the Indian Ocean, 300 miles from the East African coast. The island also, however, sits at the western edge of population expansions out of Island South East Asia. The origin of these populations, and the timing of their arrival in Madagascar, are still debated questions. To address this intriguing history, we have chosen to study, from an anthropogenetic approach, the Mikea, a hunter gatherer population located in the south-west region of Madagascar. Genetic elements of the population were studied using several markers including uni-parental marker Y and mtDNA chromosomes or recently bi-parental markers. Here we present a comparison between these different sets of markers and show how differences between them can provide important insights for understanding the history of this population. Furthermore, this comparison brings to

light advances in the understanding of the settlement history of populations in the south of the island.

SCHENK, Heidrun

POTS ON VOYAGE – NEW DATA ON SOUTH ASIAN EARLY HISTORICAL POTTERY

Heidrun Schenk

Indian Ocean studies often rely on easily identifiable wares such as 'Rouletted Ware', but riveted fragments testify to their esteem, resulting in longer use due to careful handling. Study of the pottery sequence from Tissamaharama (Sri Lanka) has accordingly focused on the investigation of common utilitarian vessels. Considered of higher chronological relevance for comparative stratigraphical studies, they form the basis for an evaluation of rare or imported wares like 'Rouletted Ware' and 'Indian Red Polished Ware'. Problems regarding their definition and new facts concerning their chronological significance will be addressed as well. A chronological outline of domestic pottery is much desired for most parts of South Asia. The Tissamaharama pottery chronology covers the period from the 5th/4th century BCE to at least the 7th century CE, with extension to the 11th/12th century CE.

Pottery of South Asian origin has been found at many littoral sites along the Indian Ocean rim. The Tissamaharama pottery sequence demonstrates that a better chronological framework for the ceramics frequently

designated as ‘coarse’ wares is possible. Literature research showed that results from Tissamaharama are relevant for a wider region, showing indications for a Pan-Indian/Sri Lankan form tradition in pottery – at least for some periods of time. Coarse wares containing Brahmi graffiti testify as to personal belongings or ship equipment rather than trading goods. This indicates a much higher participation of South Asians within this network than normally recognised, as is also shown by graffiti left behind in a cave on the island of Socotra. A recently published study of finds identified as of South Asian origin at Sumhuram (Khor Rori) in Oman on the basis of the Tissamaharama pottery sequence highlights the potential for well-dated coarse wares (Pavan/Schenk 2012). The paper presents a finds assemblage confined to the early occupation layer, which contained fragments of ‘Rouletted Ware’ (RW). The vessel shapes of the according South Asian common pottery could be identified as contemporaneous to RW.

SELAND, Eivind Heldaas

FROM THE DESERT TO THE SEAS: NETWORK BUILDING IN THE INDIAN OCEAN – THE CASE OF PALMYRA

Eivind Heldaas Seland

The Syrian desert-city of Palmyra was a major node in the trade between the Indian Ocean and the Mediterranean in the first three centuries AD. Palmyrene merchants started

operating caravans to the Persian Gulf, but soon took to the seas themselves, operating as ship-owners and merchants in the Red Sea, the Persian Gulf and the Arabian Sea. How did a group of camel- herders manage the transition to maritime merchants? Juxtaposing epigraphic and archaeological evidence with theoretical perspectives from Social Network Analysis and New Institutional Economics allows us to approach the process of forming a maritime community, shedding light on the organization and nature of early historical Indian Ocean trade.

SELVAKUMAR, V.

CULTURAL ATTITUDES TO COMMERCIAL ACTIVITIES IN EARLY HISTORIC SOUTH INDIA

V. Selvakumar

The Early Historic period in South India witnessed increased commercial activities as evidenced by textual and archaeological records. The textual records of this period shed light on the mindset of south Indian populations in relation to new commercial developments. The Sangam Tamil texts graphically portray the cultural life of societies in South India, and also reflect the commercial activities of this period. In the Sangam poems, one of the more popular themes is that of the hero leaving the heroine in search of material wealth; the angst of the heroine is graphically discussed in the poems. A poem from Kalittogai notes that those who went in search of wealth

did not acquire it with ease, and those who stayed behind did not die of starvation. These poems reflect the attitudes of South India societies to new means of acquiring wealth, with particularly focus on itinerant commercial activities. Material culture also indirectly reflects the attitudes of societies, evidenced through the introduction of new artefacts (jewellery, Roman coins) and prestige goods (Roman wine). This paper describes the attitudes of various South Indian cultural groups of the Early Historic period as reflected in the Sangam Tamil texts, Tamil-Brahmi inscriptions and material culture.

SINCLAIR, Paul

**NEW INSIGHTS INTO THE ARCHAEOLOGY OF
THE MOZAMBIKAN COASTAL PLAIN IN THE
FIRST MILLENNIUM AD: LOCAL
DEVELOPMENTS AND REGIONAL CONNECTIONS**

Paul Sinclair, Hilario Madiquide, Marjaana
Kohtamäki, Anneli Ekblom & Leonard
Adamowicz

Recent developments in field archaeology in the Mozambican coastal plain have further demonstrated the presence of pottery and iron-using communities in the earliest centuries AD from Cabo Delgado in the north, from the Zambezi delta in central Mozambique and from Maputo in the far south. Increased availability of chronological data points to the need for rethinking some

entrenched paradigms. Stone tools in association with ceramics are best attested from the cave sites in Nampula; but in open sites such as Lumbi on the southern bank of the Zambezi there is a clear separation of stone tools and pottery in undisturbed contexts. South of Maputo, new site distribution data permits modeling of alternative settlement systems of stone and pottery-using communities. Ceramics from throughout the coastal plain represent variants of the Kwale Matola tradition. In Nampula, sites are found in both the coast and interior, and occur in significant densities in a number of chronological phases. In some cases such as Chibuene, (perhaps earlier) Matola tradition pottery occurs with admixture of ceramics and materials known from the Kenya Tanzania coast as well as glazed and unglazed wares imported from the Gulf from the 7th century AD onwards. Details of subsistence are best known from Chibuene with botanical evidence for farming and land clearance and osteological evidence indicating the presence of cattle and ovi-caprines together with a range of terrestrial and marine fauna. At Lumbi on the southern bank of the Zambezi, the presence of domestic stock and hunted species in the Matola phase is now confirmed. Evidence for iron working is widespread in areas of red soils but less common in sites such as Chibuene with sandy regosols. These results, together with detailed work by Wood on the chemical composition and distribution of glass beads from Chibuene and elsewhere in southern Africa, provide an empirical basis for detailed comparison with other regions as has recently been carried out in regard to ceramics by Fleisher and Wynne Jones. Together, these results demonstrate the crucial role of the Mozambican coastal plain in articulating the trading

networks of the southern African interior and the Western Indian Ocean seaboard.

SMITH, Monica

LOCAL PRODUCTS AND LONG-DISTANCE EXCHANGE: PERSPECTIVES FROM THE EASTERN INDIAN SUBCONTINENT IN THE EARLY HISTORIC PERIOD (3RD CENTURY BC-4TH CENTURY AD)

Monica Smith

Each object that becomes an item of ‘exotica’ starts as a local product. How does a commonplace object in one locale become a desired import in another? What are the mechanisms that selectively add value to the successive transfers of objects and raw materials? Archaeological investigations tend to privilege the indestructible potsherd as the principal arbiter of long-distance exchange, leaving aside the theoretical consideration of many other types of materials that fluctuate in desirability from one culture and from one time period to another. Commodity value is assigned through both local sensibilities of provision and perceptions of the eventual compensation to local handlers for the costs of extraction, transportation, and distribution, as well as the risks of lost investment when the goods are transferred across greater and greater distances.

This paper will examine exchange from the perspective of the eastern Indian subcontinent, where trade activities in

the Early Historic period appear to have been much more focused on local (i.e. within and along the Indian coast) than long-distance trade to other cultural regions. Unlike the connections sustained between the western subcontinent and the East African/Mediterranean world, the eastern Indian subcontinent did not have a robust parallel trade with Southeast Asia until many centuries later. Research at the ancient urban centre of Sisupalgarh and its environs illustrates the ways in which local trade dynamics dominated the economic sphere of the eastern Indian coast independently of any long-distance impetus to exchange.

TAN, Terence

THE ROLE OF PYU GOLD IN THE PROTO-GLOBALISATION OF THE INDIAN OCEAN TRADE NETWORKS

Terence Tan

This paper discusses the role of gold, particularly gold ornaments, of the Pyu cultures of Upper Myanmar dating from circa 200 BCE to 900 CE. During this period, the Pyu constructed massive brick walls surrounding religious and royal compounds, the largest example being the circular enclosed city of Sri Ksetra with an area of 1880 hectares. Within Sri Ksetra, specialized craftsmen not only produced the bricks to build the city but also made gold jewellery for personal wear and to donate for the construction of new stupas. Prior to the Pyu culture, gold

was used only sparingly; for example, to coat terracotta beads of the Bronze-Iron Age culture of the Samon valley dating to circa 600 BCE to 300 CE. With the widening of trade from all regions of Myanmar to Sri Lanka, South Asia and beyond in the early centuries CE, however, gold came to be lavishly used.

This paper focuses on the gold-working technology of the Pyu and the distinctive artefacts that have been recovered from archaeological surveys and excavations at Sri Sketra since the early 20th century. These objects include a set of solid gold plates in the shape of a palm leaf manuscript inscribed with texts from the three books of the Pali canon, images of the Buddha, as well as personal ornaments such as rings, bracelets and pendants. The gold heritage is one of the many aspects of Myanmar culture that changed with expanding Indian trade in the proto-global era, and one that is a vital part of Buddhist heritage that has been sustained to the present day, with new monasteries and gold objects continuing to be offered at the ancient city of Sri Sketra. Gold objects also continue to be made, from gold leaf, to adorn images of the Buddha, and for the flourishing gold markets of Myanmar cities, and the importance of the metal is seen in the prefix of *Shwe*, meaning gold, found in the names for pagodas such as the Shwedagon and throughout the country. This paper combines information from archaeology and art history alongside discussion of the technical details of the gold manufacturing process past and present.

**EXPLORING POTTERY DISTRIBUTION AND
CONSUMPTION DURING THE INDO-ROMAN
PERIOD**

Roberta Tomber

Within Indian Ocean studies, and especially during the Indo-Roman period, pottery has been heavily relied upon to document trade between the West and India. In particular, the discovery of Roman amphorae in India, ostensibly traded for their contents, has been used to support the established orthodoxy of a trade instigated and controlled by the Romans. This paradigm has now shifted, and multiple strands of material evidence, including a range of pottery types from amphorae to cooking and table wares, indicate active participation not only from India but also from South Arabia and East Africa. Importantly, the diversity of types suggests complex mechanisms behind their distribution, incorporating a variety of explanations, from economic (such as trade in foodstuffs and provisioning) to reinforcing socio-cultural and religious interactions.

This paper will examine case studies from four geographic regions within the Indian Ocean: the Red Sea, South Arabia, East Africa and India, during the period between c. late first century BC and the early sixth century AD. Comparisons between the types of pottery distributed and the context in which they are found will highlight the different imperatives and social meanings behind the long-

distance distribution of pottery in order to better understand the mechanisms that support and stimulate trading networks.

TRINKS, Alexandra

GENETIC AND MORPHOLOGICAL ANALYSES OF *RATTUS* ACROSS THE INDIAN OCEAN

Alexandra Trinks, Ardern Hulme-Beaman, Heidi Eager, Atholl Anderson, Allowen Evin, Thomas Cucchi, Nicole Boivin, Jeremy Searle, Keith Dobney, Greger Larson

Rats provide an excellent proxy for human migration and trade. With a wide distribution and close commensal relationship with humans, rats and their dispersal patterns can help reveal direct routes and relationships between regions of the Indian Ocean. *Rattus rattus* and *R. tanezumi* are of central importance to this story. Here, we apply both geometric morphometric (GM) analyses of >2000 individual rat teeth and a mitochondrial assessment of >500 museum rat specimens to not only establish correlations between the geographical provenance of specimens and to identify the genetic and morphological relationships of populations between different regions, but also to assess the degree of correspondence between the datasets derived from two different levels of biological organization. Our preliminary results suggest a fine-scale pattern of highly variable populations across the region. Morphologically, we identified similarities between *R.*

tanezumi populations in Southeast Asia and *R. rattus* populations from Madagascar, suggesting an Austronesian importation of rats across the Indian Ocean. Genetically, we have identified several unique, geographically restricted phylogenetic clades that may be the result of human introduction throughout the region.

VRYDAGHS, Luc

THE BANANA: INSIGHTS INTO AN INDIAN OCEAN ODYSSEY

Luc Vrydaghs, Frederic Bakry, Nicole Boivin, Alison Crowther, Pierre de Maret, Edmond de Langhe, Tim Denham, Mark Donohue, Dorian Fuller, Juan Jose Garcia-Granero, Carla Lancelotti, Marco Madella, Xavier Perrier & Michele Wollstonecroft

Although the banana is a globally important commercial crop, it is estimated that 100 million tonnes (87%) of banana production is for local food consumption, making it one of the major foods, as well as a utilitarian and cultural resource of people living in tropical rainforests. While bananas have a wide pan-tropical distribution, domestication initially took place in the region of primary *Musa* diversity, from Southeast Asia to New Guinea. Starting from this primary domestication area, bananas underwent a westward diffusion to the African continent

through the Indian Ocean, and eastward diffusion through the Pacific.

Two *Musa* species, *Musa acuminata* and *M. balbisiana*, played key roles in the complex geodomestication process that began with intra- and inter-species hybridizations and plant translocation, and ended in polyploidization, seed sterility, parthenocarpy and vegetative reproduction. As such, edible bananas must have been diffused by human populations and spread within vegetative forms of cultivation, implying conscious translocation from the East. In recent years, the banana has received more research attention than any other vegetative crop, having been the target of a range of genetic, botanical, ecological, archaeological, linguistic and other studies. When archaeobotanical evidence for *Musa* is examined in conjunction with historical linguistic findings, chronologies of edible generation and translocation can be proposed, shedding light on processes of banana diffusion. In addition to addressing current molecular data on the banana, which signal multiple waves of diffusion, the present contribution will also synthesise the various disciplinary lines of evidence currently available to explore the pan-Indian Ocean translocation of bananas, as well as early processes of trade, exchange and migration in the Indian Ocean.

**HINTERLAND EAST AFRICA DURING THE LATE
FIRST MILLENNIUM CE: ENVIRONMENTAL
CHANGES, POLITICAL ECONOMIES, AND
LINKAGES TO THE WESTERN INDIAN OCEAN**

Jonathan Walz

This paper about human and commercial intersections across central coastwise East Africa brings together new results of an archaeological project conducted in northeastern Tanzania. The collective outcome of this systematic, problem-oriented research contributes to a clearer and transformed understanding of evidence for exchange, intercommunity relations, fluctuations in political economies, and shifting human-environment relations, 500-1000 CE.

This presentation describes an inclusive historical archaeological project that employs recent traces of history and ethnography to integrate pre-Eurasian pasts from deep time into regional narratives. The project uses a ‘caravan route’ strategy and systematic archaeological survey along the lower Pangani Basin to co-join areas and communities previously considered disconnected, extending intercommunity ties to the Indian Ocean during middle to late first millennium CE.

A systematic archaeological survey in five vicinities documented more than 325 new archaeological localities. Sites and artefacts—including extra-local ceramics, beads,

shell, and debris from profuse iron smelting along the foot slopes of the Eastern Arc Mountains—signal the florescence of iron-using, farming and other communities during the ‘Middle Iron Age’. These materials, seemingly ‘mundane,’ provide insights into unique pasts of the region with implications for the cultures and economies of coastwise East Africa and beyond. Material evidence suggests increasing, but fluctuating, regional connectivity and ties to Indian Ocean networks.

This integrative, historical archaeological approach to human social and economic connectivity suggests that archaeologists need to move beyond extant paradigms that often dichotomize people and pasts and toward more encompassing approaches that draw from a range of sources to address multi-scalar concerns with relevance to both Africa and the Indian Ocean. In this case, a more complete and nuanced understanding of coastwise East Africa, its communities, and its past emerges from such a treatment.

WILMSEN, Edwin

LANDLINKS: THE EXTENSION OF INTEROCEANIC EXCHANGE FROM THE COAST TO THE FAR INTERIOR

Edwin Wilmsen

The archaeology of the African East Coast has understandably been focused eastward across the Indian

Ocean in order to discover links to sources of imported materials found at sites all along the coast. More recently, research has also been directed to the near hinterland of some of these sites. But links to the more distant interior stretch westward two-thirds of the distance across the continent. In the mid-8th century CE, glass beads in moderate numbers, marine shells (cowries and cones), and shell beads apparently made from marine bivalves, probably *Anadara* spp., arrived at the Nqoma site in the Tsodilo Hills of northwestern Botswana some 1500-2000 km from, respectively, Moçambique and Tanzania coastal sites. The great majority of the glass beads are Zhizo series, but a few have a different chemistry identified only at Nqoma and Chibuene, a major glass bead site on the Moçambique coast. In about the mid-10th century, Zhizo series, but not Chibuene series, beads in much larger numbers appear in the Shashe-Limpopo region some 600 km from Chibuene. About 50 years later, Zhizo glass beads were at Bosutswe, a hill site in Southeastern Botswana 300 km farther west. At the same time, that is ca. 1000 CE, *Gallus domesticus*, domestic chickens, and *Rattus rattus*, black rats, arrived at Bosutswe. Clay figurines of Indian zebu-type, hump-backed cattle found at Serondela near the Chobe-Zambezi river confluence, and skeletal remains at Nqoma and Bosutswe, indicate that breeds of this kind and Sanga type cross-breeds are also present at this time. This is a significant suite of Indian Ocean contributions to the Early and Middle Iron Age economies of interior southern Africa, but it is noteworthy that neither chickens nor rats have been identified at Nqoma or any of the other 13 sites at Tsodilo, nor are they reported from any of the numerous excavated sites in Zambia and Zimbabwe. Petrographic analysis of pot

sherds and clays, however, demonstrates conclusively that pots made from clays derived from Choma-Kalomo granites in south-central Zambia and others made from Chobe-Zambezi riverine clays were taken to Ngoma before ca. 900 CE; these pots would have travelled 600 km and 400 km, respectively, traversing several language areas along the way. Similar transport of materials is not apparent in the southern portion of the study area until after ca. 1000 CE. As well, chickens and rats cannot be herded like cattle; though both are passive travelers, chickens must be fed while nocturnal black rats can take care of themselves so long as goods bundles remain relatively unrolled. This strongly suggests diverse modes of exchange and transport along different routes of dissemination stemming from different coastal entrepôts at which a variety of economic and political transactions were required to obtain the goods taken inland. In this paper I evaluate several possible scenarios and offer suggestions as to which may be the more probable.

WOOD, Marilee

**LINKED IN? EASTERN AFRICA AND INDIAN
OCEAN TRADE IN THE FIRST MILLENNIUM CE:
THE GLASS BEAD EVIDENCE**

Marilee Wood

The most copious archaeological evidence of eastern Africa's participation in Indian Ocean trade in the first millennium CE is found in the form of glass beads.

Because most of these are small and monochrome, it has been difficult for archaeologists to use them in their efforts to trace trade patterns. Advances in the past decade or so, particularly in the chemical analysis of glass composition, have opened the way to begin the building of solid evidence of this trade, including sources of the beads, circuits by which they were traded and temporal parameters in which the trade occurred.

The validity of claims that glass beads provide proof of long distance trade to East Africa before 500 CE will be examined. Then bead evidence of trade between 500 and 1000 CE will be explored. This will include well documented assemblages from southern Africa in this early period followed by a discussion of how those compare to bead assemblages found at contemporary East Coast sites. Of particular interest will be the beads recently recovered from early sites on Zanzibar Island - Unguja Ukuu and Fukuchani - which promise to add new insights into global connectivity in this early period, including possible links with Mantai, in northwest Sri Lanka, and Berenike, an Egyptian port on the Red Sea.

WYNNE-JONES, Stephanie

THE END OF AN ERA? THE EAST AFRICAN COAST AT AD 1000

Stephanie Wynne-Jones, Adria LaViolette & Jeffrey Fleisher

Discontinuity characterises the 10th-11th century levels of archaeological sites around the Indian Ocean rim, discernible in various forms from India to the East coast of Africa. Historical and archaeological evidence of this period suggests a breakdown in the burgeoning systems of commerce and interaction that had characterised the first millennium in this vast region, resumed only after a hiatus of as much as a century. In East Africa, discussion of this break has been masked by the emphasis on evolutionary change that has been an important part of understanding the African roots of coastal communities. Yet despite the evident continuity of population and lifeway, archaeology here can document a series of important ways that patterns of settlement and trade shifted at this time, raising questions as to the extent that second-millennium Swahili society should be used to understand that of the first millennium.

In this paper we take up this question, using the 10th-century hiatus as a moment from which to look back at first-millennium trade and settlement on the East African coast. We review evidence from well-known sites such as Manda, Shanga, and Unguja Ukuu, and discuss them in the light of new data on ceramics and on 7th-10th century settlement on Pemba. We suggest that societies of the first millennium might have operated in a different way to those of later centuries, with interaction and trade occurring through village settlement and across existing networks that incorporated inland groups. This provides an alternative way of thinking through Indian Ocean networks at this time.